



Technical Package Cover Page

This file contains the following documents:

1. Summary of application (in plain language)
 - English
 - Alternative Language (Spanish)
2. First notice (NORI-Notice of Receipt of Application and Intent to Obtain a Permit)
 - English
 - Alternative Language (Spanish)
3. Second notice (NAPD-Notice of Preliminary Decision)
 - English
 - Alternative Language (Spanish)
4. Application materials *
5. Draft permit *
6. Technical summary or fact sheet *

* **NOTE:** This application was declared Administratively Complete before June 1, 2024. The application materials, draft permit, and technical summary or fact sheet are available for review at the Public Viewing Location provided in the NAPD.



Portada de Paquete Técnico

Este archivo contiene los siguientes documentos:

1. Resumen de la solicitud (en lenguaje sencillo)
 - Inglés
 - Idioma alternativo (español)
2. Primer aviso (NORI, Aviso de Recepción de Solicitud e Intención de Obtener un Permiso)
 - Inglés
 - Idioma alternativo (español)
3. Segundo aviso (NAPD, Aviso de Decisión Preliminar)
 - Inglés
 - Idioma alternativo (español)
4. Materiales de la solicitud **
5. Proyecto de permiso **
6. Resumen técnico u hoja de datos **

** **NOTA:** Esta solicitud se declaró administrativamente completa antes del 1 de junio de 2024. Los materiales de la solicitud, el proyecto de permiso, y los resumen técnico u hoja de datos están disponibles para revisión en la ubicación de consulta pública que se indica en el NAPD.

Plain Language Summary Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

This template is a guide to assist applicant's in developing a plain language summary as required by [30 Texas Administrative Code Chapter 39 Subchapter H](#). Applicant's may modify the template as necessary to accurately describe their facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how the applicant will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the blanks below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements.

If you are subject to the alternative language notice requirements in [30 Texas Administrative Code §39.426](#), **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS

INDUSTRIAL WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 Texas Administrative Code Chapter 39. The information provided in this summary may change during the technical review of the application and are not federal enforceable representations of the permit application.

ChampionX Freeport (CN602898751) operates the ChampionX Freeport facility , a chemical manufacturing facility. The facility is located at mailing address PO Box 2167, in Freeport, Brazoria County, Texas 77542.

The request is an application to renew the industrial wastewater discharge permit WQ0001806000.

Discharges from the facility are expected to contain wastewater with significant concentrations of oxygen demanding substances from internal Outfall 101 only. All outfalls are tested for pH, O&G, COD, TSS, NH3, BOD and Enterococci. The wastewater consists of process wastewater (process condensate, scrubber blowdown water, process equipment/area wash water, flare seal water, water contained in raw materials, laboratory wastewater, and potentially contaminated stormwater that is collected

within the plant's curbed storage and process areas. is treated by the wastewater being pumped to Tank 211, which is a 158,000 gallon wastewater equalization holding tank. This tank is used to equalize the flow to the wastewater treatment unit. The process wastewater is treated in an on-site activated carbon biological treatment unit. Treatment units include: biological oxidation, carbon adsorption, clarification, and sludge storage.

INSTRUCTIONS

1. Enter the name of applicant in this section. The applicant name should match the name associated with the customer number.
2. Enter the Customer Number in this section. Each Individual or Organization is issued a unique 11-digit identification number called a CN (e.g. CN123456789).
3. Choose “operates” in this section for existing facility applications or choose “proposes to operate” for new facility applications.
4. Enter the name of the facility in this section. The facility name should match the name associated with the regulated entity number.
5. Enter the Regulated Entity number in this section. Each site location is issued a unique 11-digit identification number called an RN (e.g. RN123456789).
6. Choose the appropriate article (a or an) to complete the sentence.
7. Enter a description of the facility in this section. For example: steam electric generating facility, nitrogenous fertilizer manufacturing facility, etc.
8. Choose “is” for an existing facility or “will be” for a new facility.
9. Enter the location of the facility in this section.
10. Enter the City nearest the facility in this section.
11. Enter the County nearest the facility in this section.
12. Enter the zip code for the facility address in this section.
13. Enter a summary of the application request in this section. For example: renewal to discharge 25,000 gallons per day of treated domestic wastewater, new application to discharge process wastewater and stormwater on an intermittent and flow-variable basis, or major amendment to reduce monitoring frequency for pH, etc. If more than one outfall is included in the application, provide applicable information for each individual outfall.
14. List all pollutants expected in the discharge from this facility in this section. If applicable, refer to the pollutants from any federal numeric effluent limitations that apply to your facility.
15. Enter the discharge types from your facility in this section (e.g., stormwater, process wastewater, once through cooling water, etc.)
16. Choose the appropriate verb tense to complete the sentence.
17. Enter a description of the wastewater treatment used at your facility. Include a description of each process, starting with initial treatment and finishing with the outfall/point of disposal. Use additional lines for individual discharge types if necessary.

**PLANTILLA EN ESPAÑOL PARA SOLICITUDES
NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP**

AGUAS RESIDUALES INDUSTRIALES/AGUAS PLUVIALES

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no son representaciones federales exigibles de la solicitud de permiso.

ChampionX Freeport (CN602898751) opera las instalaciones de ChampionX Freeport, una instalación de fabricación de productos químicos. La instalación está ubicada en la dirección postal PO Box 2167, en Freeport, Condado de Brazoria, Texas 77542. Esta solicitud es una solicitud para renovar el permiso de descarga de aguas residuales industriales WQ0001806000. Se espera que las descargas de la instalación contengan aguas residuales con concentraciones significativas de sustancias que requieren oxígeno únicamente del emisario interno 101. Todos los emisarios se analizan para determinar pH, O&G, COD, TSS, NH3, BOD, etc. Las aguas residuales consisten en aguas residuales de proceso (condensado de proceso, agua de purga de depuradores, agua de lavado de área/equipo de proceso, agua de sello de llamarada, agua contenida en materias primas, aguas residuales de laboratorio y aguas pluviales potencialmente contaminadas) que se recolectan dentro de las áreas de procesamiento y almacenamiento restringido de la planta. Se trata mediante el bombeo de aguas residuales al Tanque 211, que es un tanque de retención de ecualización de aguas residuales de 158,000 galones. Este tanque se utiliza para igualar el flujo a la unidad de tratamiento de aguas residuales. Las aguas residuales del proceso se tratan en una unidad de tratamiento biológico de carbón activado in situ. Las unidades de tratamiento incluyen: oxidación biológica, adsorción de carbón, clarificación y almacenamiento de lodos.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



NOTICE OF RECEIPT OF APPLICATION AND INTENT TO OBTAIN WATER QUALITY PERMIT RENEWAL

PERMIT NO. WQ0001806000

APPLICATION. ChampionX LLC, P.O. Box 2167, Freeport, Texas 77542, which owns a chemical manufacturing facility, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0001806000 (EPA I.D. No. TX0008761) to authorize the discharge of treated wastewater and stormwater at an intermittent and flow-variable volume via Outfall 001 and the discharge of stormwater at an intermittent and flow-variable volume via Outfalls 002, 003, 004, and 005. The facility is located at 2322 County Road 229, in the city of Freeport, Brazoria County, Texas 77541. The discharge route is from the plant site via Outfall 001 to Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal; via Outfalls 002, 003, and 004 to unnamed ditches, thence to the Old Brazos River Channel Tidal; and via Outfall 005 either to an unnamed ditch which flows to a pumping station, thence to the Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal, or from the pumping station to the Dow Barge Canal, thence to Old Brazos River Channel Tidal. TCEQ received this application on March 20, 2024. The permit application will be available for viewing and copying at Brazoria County Library – Freeport Branch, 410 North Brazosport Boulevard, Freeport, in Brazoria County, Texas prior to the date this notice is published in the newspaper. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. <https://gisweb.tceq.texas.gov/LocationMapper/?marker=-95.334166,28.957222&level=18>

ALTERNATIVE LANGUAGE NOTICE. Alternative language notice in Spanish is available at <https://www.tceq.texas.gov/permitting/wastewater/plain-language-summaries-and-public-notices>. El aviso de idioma alternativo en español está disponible en <https://www.tceq.texas.gov/permitting/wastewater/plain-language-summaries-and-public-notices>.

ADDITIONAL NOTICE. TCEQ's Executive Director has determined the application is administratively complete and will conduct a technical review of the application. After technical review of the application is complete, the Executive Director may prepare a draft permit and will issue a preliminary decision on the application. **Notice of the Application and Preliminary Decision will be published and mailed to those who are on the county-wide mailing list and to those who are on the mailing list for this application. That notice will contain the deadline for submitting public comments.**

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting on this application. The purpose of a public meeting is to provide the opportunity to submit comments or to ask questions about the application. TCEQ will hold a public meeting if the Executive Director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for submitting public comments, the Executive Director will consider all timely comments and prepare a response to all relevant and material, or significant public comments. **Unless the application is directly referred for a contested case hearing, the response to comments, and the Executive Director's decision on the application, will be mailed to everyone who submitted public comments and to those persons who are on the mailing list for this application.** If comments are received, the mailing will also provide instructions for requesting reconsideration of the Executive Director's decision and for requesting a contested case hearing. A contested case hearing is a legal proceeding similar to a civil trial in state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period and, the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period.** TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be placed on: (1) the permanent mailing list for a specific applicant name and permit number; and/or (2) the mailing list for a specific county.

If you wish to be placed on the permanent and/or the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at www.tceq.texas.gov/goto/cid. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at <https://www14.tceq.texas.gov/epic/eComment/>, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, Toll Free, at 1-800-687-4040 or visit their website at www.tceq.texas.gov/goto/pep. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from ChampionX LLC at the address stated above or by calling Mr. Andy Slater, SH&E Superintendent, at 979-239-5880.

Issuance Date: April 25, 2024

Comisión de Calidad Ambiental del Estado de Texas



AVISO DE RECIBO DE LA SOLICITUD Y EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA RENOVACION

PERMISO NO. WQ0001806000

SOLICITUD. ChampionX LLC, P.O. Box 2167, Freeport, Texas 77542, que posee una instalación de fabricación de productos químicos, ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) para renovar el Permiso No. WQ0001806000 (EPA I.D. No. TX0008761) del Sistema de Eliminación de Descargas de Contaminantes de Texas (TPDES) para autorizar la descarga de aguas residuales tratadas y pluviales en volumen intermitente y de flujo variable por los Emisarios 001 y la descarga de aguas pluviales en volumen intermitente y de flujo variable por los Emisarios 002, 003, 004 y 005. La planta está ubicada 2322 County Road 229, en la ciudad de Freeport, Condado de Brazoria, Texas 77541. La ruta de descarga es del sitio de la planta a través del Emisario 001 hasta el Canal de Efluentes de la Planta Química "A", y de allí hasta Brazos River Tidal; a través de los emisarios 002, 003 y 004 hasta zanjas sin nombre, desde allí hasta la marea del canal del río Old Brazos; y a través del emisario 005, ya sea a una zanja sin nombre que fluye a una estación de bombeo, de allí al canal de efluentes "A" de la planta química de Dow, de allí a Brazos River Tidal, o desde la estación de bombeo al canal de barcas de Dow, de allí a Marea del canal del río Old Brazos. La TCEQ recibió esta solicitud el 20 de marzo de 2024. La solicitud de permiso estará disponible para ver y copiar en la Biblioteca del Condado de Brazoria – Sucursal de Freeport, 410 North Brazosport Boulevard, Freeport, en el Condado de Brazoria, Texas, antes de la fecha en que se publique este aviso en el periódico. Este enlace a un mapa electrónico de la ubicación general del sitio o instalación se proporciona como cortesía pública y no forma parte de la solicitud o aviso. Para conocer la ubicación exacta, consulte la aplicación. <https://gisweb.tceq.texas.gov/LocationMapper/?marker=-95.334166,28.957222&level=18>

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.**

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés

público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión. La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo, la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Además, puede pedir que la TCEQ ponga su nombre en una o más de las listas

correos siguientes (1) la lista de correo permanente para recibir los avisos del solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado específico. Si desea que se agregue su nombre en una de las listas designe cual lista(s) y enviar por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

CONTACTOS E INFORMACIÓN A LA AGENCIA. Todos los comentarios públicos y solicitudes deben ser presentadas electrónicamente vía <http://www14.tceq.texas.gov/epic/eComment/> o por escrito dirigidos a la Comisión de Texas de Calidad Ambiental, Oficial de la Secretaría (Office of Chief Clerk), MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Para obtener más información acerca de esta solicitud de permiso o el proceso de permisos, llame al programa de educación pública de la TCEQ, gratis, al 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

También se puede obtener información adicional del ChampionX LLC a la dirección indicada arriba o llamando a Andy Slater al 979-239-5880.

Fecha de emisión 25 de abril de 2024

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR TPDES PERMIT FOR INDUSTRIAL WASTEWATER

RENEWAL

Permit No. WQ0001806000

APPLICATION AND PRELIMINARY DECISION. ChampionX LLC, P.O. Box 2167, Freeport, Texas 77542, which operates ChampionX Freeport Plant, a chemical manufacturing plant, has applied to the Texas Commission on Environmental Quality (TCEQ) for a renewal of Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0001806000, which authorizes the discharge of previously monitored effluents (PMEs) (process wastewater, domestic wastewater, utility wastewater, stormwater, and treated groundwater) on an intermittent and flow variable basis via Outfall 001 (process wastewater, domestic wastewater, and utility wastewater at a daily average flow not to exceed 0.0236 MGD via internal Outfall 101; stormwater on an intermittent and flow-variable basis via internal Outfall 201; treated groundwater at a daily average flow not to exceed 0.030 MGD via internal Outfall 301); and stormwater on an intermittent and flow-variable basis via Outfalls 002, 003, 004, and 005. The TCEQ received this application on March 20, 2024.

The facility is located at 2322 County Road 229, in the City of Freeport, Brazoria County, Texas 77541. This link to an electronic map of the site or facility's general location is provided as a public courtesy and is not part of the application or notice. For the exact location, refer to the application.

<https://gisweb.tceq.texas.gov/LocationMapper/?marker=-95.334166,28.957222&level=18>

The effluent is discharged via Outfall 001 to Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River Basin; via Outfalls 002, 003, and 004 to unnamed ditches, thence to the Old Brazos River Channel Tidal in Segment No. 1111 of the San-Jacinto Brazos Coastal Basin; and via Outfall 005 either to an unnamed ditch which flows to a pumping station, thence to the Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River Basin, or from the pumping station to the Dow Barge Canal, thence to Old Brazos River Channel Tidal in Segment No. 1111 of the San Jacinto-Brazos Coastal Basin. The unclassified receiving waters uses are minimal aquatic life use for the unnamed ditches and high aquatic life use for the Dow Barge Canal. The designated uses for Segment No. 1201 are primary contact recreation, public water supply, and high aquatic life use and primary contact recreation and high aquatic life use for Segment No. 1111. The public water supply designation for Segment No. 1201 only applies from the upstream boundary to 300 meters (330 yards) downstream of SH 332 in Brazoria County. Public water supply designation for Segment No. 1201 ends 17 miles upstream of Dow Canal outlet, public water supply criterion does not apply at the Dow Canal outlet.

The TCEQ Executive Director has completed the technical review of the application and prepared a draft permit. The draft permit, if approved, would establish the conditions under which the facility must operate. The Executive Director has made a preliminary decision that this permit, if issued, meets all statutory and regulatory requirements. The permit application, Executive Director's preliminary decision, and draft permit are available for viewing and copying at Brazoria County Library – Freeport Branch, 410 North Brazosport Boulevard, Freeport, in Brazoria County, Texas. The application, including any updates, and associated notices are available electronically at the following webpage:

<https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications>

ALTERNATIVE LANGUAGE NOTICE. Alternative language notice in Spanish is available at <https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications>. El aviso de idioma alternativo en español está disponible en <https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications>.

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit written or oral comment or to ask questions about the application. Generally, the TCEQ will hold a public meeting if the Executive Director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for public comments, the Executive Director will consider the comments and prepare a response to all relevant and material, or significant public comments. **The response to comments, along with the Executive Director's decision on the application, will be mailed to everyone who submitted public comments or who requested to be on a mailing list for this application. If comments are received, the mailing will also provide instructions for requesting a contested case hearing or reconsideration of the Executive Director's decision.** A contested case hearing is a legal proceeding similar to a civil trial in a state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period; and the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period. TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.**

EXECUTIVE DIRECTOR ACTION. The Executive Director may issue final approval of the application unless a timely contested case hearing request or a timely request for reconsideration is filed. If a timely hearing request or request for reconsideration is filed, the Executive Director will not issue final approval of the permit and will forward the application and requests to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be added to: (1) the permanent list for a specific applicant name and permit number; and (2) the mailing list for a specific county. If you wish to be placed on the permanent and the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

All written public comments and public meeting requests must be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 or electronically at <https://www.tceq.texas.gov/goto/comment> within 30 days from the date of newspaper publication of this notice.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at <https://www.tceq.texas.gov/goto/cid/>. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. Public comments and requests must be submitted either electronically at <https://www.tceq.texas.gov/goto/comment>, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address, and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, toll free, at 1-800-687-4040 or visit their website at <https://www.tceq.texas.gov/agency/decisions/participation/permitting-participation>. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from ChampionX LLC at the address stated above or by calling Mr. Andy Slater, SH&E Superintendent, at 979-239-5880.

Issued: September 13, 2024

Comisión De Calidad Ambiental Del Estado De Texas



AVISO DE LA SOLICITUD Y DECISIÓN PRELIMINAR PARA EL PERMISO DEL SISTEMA DE ELIMINACION DE DESCARGAS DE CONTAMINANTES DE TEXAS (TPDES) PARA AGUAS RESIDUALES INDUSTRIALES

RENOVACIÓN

PERMISO NO. WQ00018060000

SOLICITUD Y DECISIÓN PRELIMINAR. **ChampionX LLC, P.O. Box 2167, Freeport, Texas 77542, which operates ChampionX Freeport Plant, a chemical manufacturing plant,** ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) una renovación para autorizar the discharge of previously monitored effluents (PMEs) (process wastewater, domestic wastewater, utility wastewater, stormwater, and treated groundwater) on an intermittent and flow variable basis via Outfall 001 (process wastewater, domestic wastewater, and utility wastewater at a daily average flow not to exceed 0.0236 MGD via Outfall 101; stormwater on an intermittent and flow-variable basis via internal Outfall 201; treated groundwater at a daily average flow not to exceed 0.030 MGD via internal Outfall 301); and stormwater on an intermittent and flow-variable basis via Outfalls 002, 003, 004, and 005. La TCEQ recibió esta solicitud el March 20, 2024.

La planta está ubicada en 2322 County Road 229, Freeport, en el Condado de Brazoria County, Texas, 77541. El efluente tratado es descargado al Outfall 001 to Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal en el Segmento No. 1201 de la Cuenca del Río Brazos River Basin; via Outfalls 002, 003, and 004 to unnamed ditches, thence to the Old Brazos River Channel Tidal in Segment No. 1111 of the San Jacinto Brzos Costal Basin; via Outfall 005 either to an unnamed ditch which flows to a pumping station, thence to the Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River Basin, or from the pumping station to the Dow Barge Canal, thence to Old Brazos River Channel Tidal in Segment No. 1111 of the San Jacinto-Brazos Costal Basin. The unclassified receiving waters uses are minimal aquatic life use for the unnamed ditches and elevados aquatic life use for the Dow Barge Canal. The designated uses for Segment No. 1201 are primary contact recreation, public wáter supply, and high aquatic life use and primary contact recreation and high aquatic life use for Segment No. 1111. The public wáter supply designation fo rSegment No. 1201 only applies from teh upstream boundary to 300 meters (330 yards) downstream of SH 332 in Brazoria County. Public waster supply designation for Segment No. 1201 ends 17 miles upstream of Dow Canal outlet, public wáter supply criterion does not apply at the Dow Canal outlet.

El Director Ejecutivo de la TCEQ ha completado la revisión técnica de la solicitud y ha preparado un borrador del permiso. El borrador del permiso, si es aprobado, establecería las condiciones bajo las cuales la instalación debe operar. El Director Ejecutivo ha tomado una

decisión preliminar que si este permiso es emitido, cumple con todos los requisitos normativos y legales. La solicitud del permiso, la decisión preliminar del Director Ejecutivo y el borrador del permiso están disponibles para leer y copiar en Brazoria County Library – Freeport Branch, 410 North Brazosport Boulevard, Freeport, in Brazoria County Texas. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página web: <https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications>. Este enlace a un mapa electrónico de la ubicación general del sitio o de la instalación es proporcionado como una cortesía y no es parte de la solicitud o del aviso. Para la ubicación exacta, consulte la solicitud.
<https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications>

AVISO DE IDIOMA ALTERNATIVO. El aviso de idioma alternativo en español está disponible en <https://www.tceq.texas.gov/permitting/wastewater/plain-language-summaries-and-public-notice>.

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD PARA UNA AUDIENCIA DE CASO IMPUGNADO. Después de la fecha límite para los comentarios públicos, el director ejecutivo considerará los comentarios y preparará una respuesta a todos los comentarios públicos relevantes y materiales, o significativos. **La respuesta a los comentarios, junto con la decisión del director ejecutivo sobre la solicitud, se enviará por correo a todos los que enviaron comentarios públicos o que solicitaron estar en una lista de correo para esta solicitud. Si se reciben comentarios, el correo también proporcionará instrucciones para solicitar una audiencia de caso impugnado o reconsiderar la decisión del director ejecutivo.** Una audiencia de caso disputado es un procedimiento legal similar a un juicio civil en un tribunal de distrito estatal.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión. La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas

que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios.

La Comisión otorgará solamente una audiencia administrativa de lo contencioso sobre los hechos reales disputados del caso que son pertinentes y esenciales para la decisión de la Comisión sobre la solicitud. Además, la Comisión sólo otorgará una audiencia administrativa de lo contencioso sobre los asuntos que fueron presentados antes del plazo de vencimiento y que no fueron retirados posteriormente. **Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso para descargar aguas residuales sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

ACCIÓN DEL DIRECTOR EJECUTIVO. El Director Ejecutivo puede emitir la aprobación final de la solicitud a menos que se presente una solicitud de audiencia de caso impugnado oportunamente o una solicitud de reconsideración. Si se presenta una solicitud de audiencia oportuna o una solicitud de reconsideración, el Director Ejecutivo no emitirá la aprobación final del permiso y enviará la solicitud y la petición a los Comisionados de la TCEQ para su consideración en una reunión programada de la Comisión.

LISTA DE CORREO. Si envía comentarios públicos, una solicitud de una audiencia de caso impugnado o una reconsideración de la decisión del Director Ejecutivo, se le agregará a la lista de correo para que esta solicitud reciba avisos públicos futuros enviadas por correo por la Oficina del Secretario Oficial. Además, puede solicitar ser colocado en: (1) la lista de correo permanente para un nombre de solicitante específico y número de permiso; y/o (2) la lista de correo para un condado específico. Para ser colocado en la lista de correo permanente y / o del condado, especifique claramente qué lista(s) y envíe su solicitud a la Oficina del Secretario Oficial de la TCEQ a la dirección a continuación.

Todos los comentarios públicos escritos y las solicitudes de reunión pública deben enviarse a la Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 o electrónicamente a <https://www14.tceq.texas.gov/epic/eComment/> dentro de los 30 días a partir de la fecha de publicación de este aviso en el periódico.

INFORMACIÓN DISPONIBLE EN LÍNEA. Para obtener detalles sobre el estado de la solicitud, visite la Base de Datos Integrada de los Comisionados en www.tceq.texas.gov/goto/cid. Busque en la base de datos utilizando el número de permiso para esta solicitud, que se proporciona en la parte superior de este aviso.

CONTACTOS E INFORMACIÓN DE LA AGENCIA. Los comentarios y solicitudes públicas deben enviarse electrónicamente a <https://www14.tceq.texas.gov/epic/eComment/>, o por escrito a Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Cualquier información personal que envíe a la TCEQ pasará a formar parte del registro de la agencia; esto incluye las direcciones de correo electrónico. Para obtener más información sobre esta solicitud de permiso o el proceso de permisos, llame al Programa de Educación Pública de la TCEQ, sin cargo, al 1-800-687-4040 o visite su sitio web en www.tceq.texas.gov/goto/pep. Si desea información en español, puede llamar al 1-800-687-4040.

También se puede obtener información adicional del ChampionX LLC a la dirección indicada arriba o llamando a Mr. Andy Slater, SH&E Superintendent, al 979-239-5880.

Fecha de emission: 13 de septiembre de 2024



TEXAS COMMISSION ON ENVIRONMENTAL
QUALITY

P.O. Box 13087
Austin, Texas 78711-3087

TPDES PERMIT NO.
WQ0001806000
*[For TCEQ office use only -
EPA I.D. No. TX0008761]*

This renewal replaces TPDES Permit
No. WQ0001806000, issued on
February 26, 2021.

PERMIT TO DISCHARGE WASTES

under provisions of
Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

ChampionX LLC

whose mailing address is

P.O. Box 2167
Freeport, Texas 77542

is authorized to treat and discharge wastes from ChampionX Freeport Plant, a chemical
manufacturing plant (SIC 2869)

located 2322 County Road 229, in the City of Freeport, Brazoria County, Texas 77541

via Outfall 001 to Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment
No. 1201 of the Brazos River Basin; via Outfalls 002, 003, and 004 to unnamed ditches, thence to the
Old Brazos River Channel Tidal in Segment No. 1111 of the San-Jacinto Brazos Coastal Basin; and via
Outfall 005 either to an unnamed ditch which flows to a pumping station, thence to the Dow Chemical
Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River
Basin, or from the pumping station to the Dow Barge Canal, thence to Old Brazos River Channel Tidal
in Segment No. 1111 of the San Jacinto-Brazos Coastal Basin

only according to effluent limitations, monitoring requirements, and other conditions set forth in this
permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ), the laws of
the State of Texas, and other orders of the TCEQ. The issuance of this permit does not grant to the
permittee the right to use private or public property for conveyance of wastewater along the discharge
route described in this permit. This includes, but is not limited to, property belonging to any
individual, partnership, corporation, or other entity. Neither does this permit authorize any invasion
of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility
of the permittee to acquire property rights as may be necessary to use the discharge route.

This permit shall expire at midnight, five years from the date of permit issuance.

ISSUED DATE:

For the Commission

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Number 001

1. During the period beginning upon the date of permit issuance and lasting through the date of permit expiration, the permittee is authorized to discharge previously monitored effluents (PMEs) (process wastewater, domestic wastewater, utility wastewater, stormwater, and treated groundwater) subject to the following effluent limitations:

Volume: flow-variable.

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average mg/L	Daily Maximum mg/L	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
Flow	Report, MGD	Report, MGD	N/A	1/day	Estimate

2. The pH must not be less than 6.0 standard units nor greater than 9.0 standard units and must be monitored 1/day by grab sample.
3. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
4. Effluent monitoring samples must be taken at the following location: At Outfall 001, currently located on the north side of the plant site, prior to discharge to the Dow Chemical Plant "A" Effluent Canal.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Number 101

1. During the period beginning upon the date of permit issuance and lasting through the date of permit expiration, the permittee is authorized to discharge process wastewater, domestic wastewater, and utility wastewater subject to the following effluent limitations:

The daily average flow of effluent shall not exceed 0.0236 million gallons per day (MGD). The daily maximum flow shall not exceed 0.050 MGD.

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average lbs/day	Daily Maximum lbs/day	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
Flow	0.0236 MGD	0.050 MGD	N/A	Continuous	Meter
Carbonaceous Biochemical Oxygen Demand (5-day)	1.6	4.1	65	2/week	Composite
Total Suspended Solids	2.7	8.2	65	2/week	Composite
Chemical Oxygen Demand	N/A	78	500	2/week	Composite
Oil and Grease	2.0	3.0	20	2/week	Grab
Ammonia Nitrogen	Report	Report	N/A	2/week	Composite
Acenaphthene	0.001	0.003	0.032	1/year	Composite
Acenaphthylene	0.001	0.003	0.032	1/year	Composite
Acrylonitrile	0.005	0.012	0.132	1/year	Composite
Anthracene	0.001	0.003	0.032	1/year	Composite
Benzene	0.002	0.006	0.074	1/year	Composite
Benzo(a)anthracene	0.001	0.003	0.032	1/year	Composite
3,4-Benzofluoranthene	0.001	0.003	0.033	1/year	Composite
Benzo(k)fluoranthene	0.001	0.003	0.032	1/year	Composite
Benzo(a)pyrene	0.001	0.003	0.033	1/year	Composite
Bis(2-ethylhexyl) phthalate	0.005	0.013	0.153	1/year	Composite
Carbon Tetrachloride	0.0009	0.002	0.021	1/year	Composite
Chlorobenzene	0.0007	0.001	0.015	1/year	Composite
Chloroethane	0.005	0.013	0.147	1/year	Composite
Chloroform	0.001	0.002	0.025	1/year	Composite
2-Chlorophenol	0.002	0.005	0.054	1/year	Composite
Chrysene	0.001	0.003	0.032	1/year	Composite
Di-n-butyl phthalate	0.001	0.003	0.031	1/year	Composite
1,2-Dichlorobenzene	0.004	0.008	0.089	1/year	Composite
1,3-Dichlorobenzene	0.002	0.003	0.024	1/year	Composite

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Outfall Number 101

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average lbs/day	Daily Maximum lbs/day	Single Grab mg/L	Report Daily Average and Measurement Frequency	Daily Maximum Sample Type
1,4-Dichlorobenzene	0.0007	0.001	0.015	1/year	Composite
1,1-Dichloroethane	0.001	0.003	0.032	1/year	Composite
1,2-Dichloroethane	0.003	0.01	0.115	1/year	Composite
1,1-Dichloroethylene	0.0008	0.001	0.014	1/year	Composite
1,2-trans-Dichloroethylene	0.001	0.003	0.030	1/year	Composite
2,4-Dichlorophenol	0.002	0.005	0.061	1/year	Composite
1,2-Dichloropropane	0.007	0.011	0.126	1/year	Composite
1,3-Dichloropropylene	0.001	0.002	0.024	1/year	Composite
Diethyl phthalate	0.004	0.010	0.111	1/year	Composite
2,4-Dimethylphenol	0.0009	0.002	0.020	1/year	Composite
Dimethyl phthalate	0.0009	0.002	0.026	1/year	Composite
4,6-Dinitro-o-cresol	0.004	0.013	0.151	1/year	Composite
2,4-Dinitrophenol	0.003	0.006	0.067	1/year	Composite
2,4-Dinitrotoluene	0.005	0.014	0.156	1/year	Composite
2,6-Dinitrotoluene	0.012	0.030	0.350	1/year	Composite
Ethylbenzene	0.002	0.005	0.059	1/year	Composite
Fluoranthene	0.001	0.003	0.037	1/year	Composite
Fluorene	0.001	0.003	0.032	1/year	Composite
Hexachlorobenzene	0.0007	0.001	0.015	1/year	Composite
Hexachlorobutadiene	0.0009	0.002	0.027	1/year	Composite
Hexachloroethane	0.001	0.003	0.030	1/year	Composite
Methyl Chloride	0.004	0.009	0.104	1/year	Composite
Methylene Chloride	0.002	0.004	0.049	1/year	Composite
Naphthalene	0.001	0.003	0.032	1/year	Composite
Nitrobenzene	0.001	0.003	0.037	1/year	Composite
2-Nitrophenol	0.002	0.003	0.037	1/year	Composite
4-Nitrophenol	0.003	0.006	0.068	1/year	Composite
Phenanthrene	0.001	0.003	0.032	1/year	Composite
Phenol	0.0007	0.001	0.014	1/year	Composite
Pyrene	0.001	0.003	0.037	1/year	Composite
Tetrachloroethylene	0.001	0.003	0.031	1/year	Composite
Toluene	0.001	0.004	0.044	1/year	Composite

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Outfall Number 101

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average lbs/day	Daily Maximum lbs/day	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
1,2,4-Trichlorobenzene	0.003	0.007	0.077	1/year	Composite
1,1,1-Trichloroethane	0.001	0.003	0.030	1/year	Composite
1,1,2-Trichloroethane	0.001	0.003	0.030	1/year	Composite
Trichloroethylene	0.001	0.003	0.030	1/year	Composite
Vinyl Chloride	0.005	0.013	0.147	1/year	Composite
Enterococci ¹	35	130	130	1/week	Grab

2. The pH must not be less than 6.0 standard units nor greater than 9.0 standard units and must be monitored 1/day by grab sample.
3. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
4. Effluent monitoring samples must be taken at the following location: At Outfall 101, following biological treatment and prior to commingling with other water discharged to the Dow Chemical Plant "A" Effluent Canal through Outfall 001.

¹ Units of measure are colony forming units (CFU) or most probable number (MPN) per 100 mL.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Number 201

1. During the period beginning upon the date of permit issuance and lasting through the date of permit expiration, the permittee is authorized to discharge stormwater subject to the following effluent limitations:

Volume: Intermittent and flow-variable.

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average mg/L	Daily Maximum mg/L	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
Flow	Report, MGD	Report, MGD	N/A	1/day ¹	Instantaneous
Chemical Oxygen Demand	N/A	200	200	1/day ¹	Grab
Oil and Grease	N/A	15	15	1/day ¹	Grab

2. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
3. Effluent monitoring samples must be taken at the following location: At Outfall 201, prior to commingling with other water discharged to the Dow Chemical Plant "A" Effluent Canal through Outfall 001.

¹ When discharging. Grab samples must be collected within the first 60 minutes after discharge begins.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Number 301

1. During the period beginning upon the date of permit issuance and lasting through the date of permit expiration, the permittee is authorized to discharge treated groundwater subject to the following effluent limitations:

The daily average flow of effluent shall not exceed 0.030 million gallons per day (MGD). The daily maximum flow shall not exceed 0.030 MGD.

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average lbs/day	Daily Maximum lbs/day	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
Flow	0.030 MGD	0.030 MGD	N/A	Continuous	Meter
Total Lead	0.08	0.17	2.30	2/month	Composite
Toluene	0.01	0.02	N/A	2/month	Composite
1,2-Dibromoethane	0.04	0.14	N/A	2/month	Composite
1,2-Dichloroethane	0.04	0.14	N/A	2/month	Composite

2. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
3. Effluent monitoring samples must be taken at the following location: At Outfall 301, prior to commingling with other water discharged to the Dow Chemical Plant "A" Effluent Canal through Outfall 001.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTSOutfall Numbers 002, 003, 004, and 005

1. During the period beginning upon the date of permit issuance and lasting through the date of permit expiration, the permittee is authorized to discharge stormwater subject to the following effluent limitations:

Volume: Intermittent and flow-variable.

Effluent Characteristics	Discharge Limitations			Minimum Self-Monitoring Requirements	
	Daily Average mg/L	Daily Maximum mg/L	Single Grab mg/L	Report Daily Average and Daily Maximum Measurement Frequency	Sample Type
Flow	Report, MGD	Report, MGD	N/A	1/day ¹	Estimate
Chemical Oxygen Demand	N/A	200	200	1/day ¹	Grab
Oil and Grease	N/A	15	15	1/day ¹	Grab

2. The pH must not be less than 6.0 standard units nor greater than 9.0 standard units and must be monitored 1/day¹ by grab sample.
3. There must be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
4. Effluent monitoring samples must be taken at the following locations:

At Outfall 002, on the south side of the plant near sump 5 over a concrete dike to a drainage ditch prior to commingling with other discharged water.

At Outfall 003, located at the southwest corner of plant site prior to discharge to the ditch.

At Outfall 004, located at the northwest corner of plant site prior to discharge to the ditch.

At Outfall 005, on the northeast side of the plant near the flare over a concrete dike to a drainage ditch prior to commingling with other discharged water.

¹ When discharging. Grab samples must be collected within the first 60 minutes after discharge begins.

DEFINITIONS AND STANDARD PERMIT CONDITIONS

As required by Title 30 Texas Administrative Code (TAC) Chapter 305, certain regulations appear as standard conditions in waste discharge permits. 30 TAC §§305.121 - 305.129 (relating to Permit Characteristics and Conditions) as promulgated under the Texas Water Code (TWC) §§5.103 and 5.105, and the Texas Health and Safety Code (THSC) §§361.017 and 361.024(a), establish the characteristics and standards for waste discharge permits, including sewage sludge, and those sections of 40 Code of Federal Regulations (CFR) Part 122 adopted by reference by the Commission. The following text includes these conditions and incorporates them into this permit. All definitions in Texas Water Code §26.001 and 30 TAC Chapter 305 shall apply to this permit and are incorporated by reference. Some specific definitions of words or phrases used in this permit are as follows:

1. Flow Measurements

- a. Annual average flow - the arithmetic average of all daily flow determinations taken within the preceding 12 consecutive calendar months. The annual average flow determination shall consist of daily flow volume determinations made by a totalizing meter, charted on a chart recorder, and limited to major domestic wastewater discharge facilities with a one million gallons per day or greater permitted flow.
- b. Daily average flow - the arithmetic average of all determinations of the daily flow within a period of one calendar month. The daily average flow determination shall consist of determinations made on at least four separate days. If instantaneous measurements are used to determine the daily flow, the determination shall be the arithmetic average of all instantaneous measurements taken during that month. Daily average flow determination for intermittent discharges shall consist of a minimum of three flow determinations on days of discharge.
- c. Daily maximum flow - the highest total flow for any 24-hour period in a calendar month.
- d. Instantaneous flow - the measured flow during the minimum time required to interpret the flow measuring device.
- e. 2-hour peak flow (domestic wastewater treatment plants) - the maximum flow sustained for a two-hour period during the period of daily discharge. The average of multiple measurements of instantaneous maximum flow within a two-hour period may be used to calculate the 2-hour peak flow.
- f. Maximum 2-hour peak flow (domestic wastewater treatment plants) - the highest 2-hour peak flow for any 24-hour period in a calendar month.

2. Concentration Measurements

- a. Daily average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit, within a period of one calendar month, consisting of at least four separate representative measurements.
 - i. For domestic wastewater treatment plants - When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values in the previous four consecutive month period consisting of at least four measurements shall be utilized as the daily average concentration.
 - ii. For all other wastewater treatment plants - When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values taken during the month shall be utilized as the daily average concentration.
- b. 7-day average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit, within a period of one calendar week, Sunday through Saturday.
- c. Daily maximum concentration - the maximum concentration measured on a single day, by the sample type specified in the permit, within a period of one calendar month.
- d. Daily discharge - the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total

mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the “daily discharge” is calculated as the average measurement of the pollutant over the sampling day.

The “daily discharge” determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the “daily discharge” determination of concentration shall be the arithmetic average (weighted by flow value) of all samples collected during that day.

- e. Bacteria concentration (Fecal coliform, *E. coli*, or Enterococci) – the number of colonies of bacteria per 100 milliliters effluent. The daily average bacteria concentration is a geometric mean of the values for the effluent samples collected in a calendar month. The geometric mean shall be determined by calculating the n th root of the product of all measurements made in a calendar month, where n equals the number of measurements made; or computed as the antilogarithm of the arithmetic mean of the logarithms of all measurements made in a calendar month. For any measurement of bacteria equaling zero, a substitute value of one shall be made for input into either computation method. If specified, the 7-day average for bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.
- f. Daily average loading (lbs/day) - the arithmetic average of all daily discharge loading calculations during a period of one calendar month. These calculations must be made for each day of the month that a parameter is analyzed. The daily discharge, in terms of mass (lbs/day), is calculated as $(\text{Flow, MGD} \times \text{Concentration, mg/L} \times 8.34)$.
- g. Daily maximum loading (lbs/day) - the highest daily discharge, in terms of mass (lbs/day), within a period of one calendar month.

3. Sample Type

- a. Composite sample - For domestic wastewater, a composite sample is a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow, and collected at the intervals required by 30 TAC §319.9(a). For industrial wastewater, a composite sample is a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow, and collected at the intervals required by 30 TAC §319.9(c).
 - b. Grab sample - an individual sample collected in less than 15 minutes.
- 4. Treatment Facility (facility) - wastewater facilities used in the conveyance, storage, treatment, recycling, reclamation or disposal of domestic sewage, industrial wastes, agricultural wastes, recreational wastes, or other wastes including sludge handling or disposal facilities under the jurisdiction of the Commission.
 - 5. The term “sewage sludge” is defined as solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in 30 TAC Chapter 312. This includes the solids that have not been classified as hazardous waste separated from wastewater by unit processes.
 - 6. Bypass - the intentional diversion of a waste stream from any portion of a treatment facility.

MONITORING AND REPORTING REQUIREMENTS

1. Self-Reporting

Monitoring results shall be provided at the intervals specified in the permit. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall conduct effluent sampling and reporting in accordance with 30 TAC §§319.4 - 319.12. Unless otherwise specified, effluent monitoring data shall be submitted each month, to the Enforcement Division (MC 224), by the 20th day of the following month for each discharge that is described by this permit whether or not a discharge is made for that month. Monitoring results must be submitted online using the NetDMR reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver. Monitoring results must be signed and certified as required by Monitoring and Reporting Requirements No. 10.

As provided by state law, the permittee is subject to administrative, civil and criminal penalties, as applicable, for negligently or knowingly violating the Clean Water Act; TWC Chapters 26, 27, and 28; and THSC Chapter 361, including but not limited to knowingly making any false statement, representation, or certification on any report, record, or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, or falsifying, tampering with or knowingly rendering inaccurate any monitoring device or method required by this permit or violating any other requirement imposed by state or federal regulations.

2. Test Procedures

- a. Unless otherwise specified in this permit, test procedures for the analysis of pollutants shall comply with procedures specified in 30 TAC §§319.11 - 319.12. Measurements, tests, and calculations shall be accurately accomplished in a representative manner.
- b. All laboratory tests submitted to demonstrate compliance with this permit must meet the requirements of 30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.

3. Records of Results

- a. Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.
- b. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), monitoring and reporting records, including strip charts and records of calibration and maintenance, copies of all records required by this permit, records of all data used to complete the application for this permit, and the certification required by 40 CFR §264.73(b)(9) shall be retained at the facility site, or shall be readily available for review by a TCEQ representative for a period of three years from the date of the record or sample, measurement, report, application or certification. This period shall be extended at the request of the Executive Director.
- c. Records of monitoring activities shall include the following:
 - i. date, time, and place of sample or measurement;
 - ii. identity of individual who collected the sample or made the measurement;
 - iii. date and time of analysis;
 - iv. identity of the individual and laboratory who performed the analysis;
 - v. the technique or method of analysis; and
 - vi. the results of the analysis or measurement and quality assurance/quality control records.

The period during which records are required to be kept shall be automatically extended to the date of the final disposition of any administrative or judicial enforcement action that may be instituted against the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit using approved analytical methods as specified above, all results of such monitoring shall be included in the calculation and reporting of the values submitted on the approved self-report form. Increased frequency of sampling shall be indicated on the self-report form.

5. Calibration of Instruments

All automatic flow measuring or recording devices and all totalizing meters for measuring flows shall be accurately calibrated by a trained person at plant start-up and as often thereafter as necessary to ensure accuracy, but not less often than annually unless authorized by the Executive Director for a longer period. Such person shall verify in writing that the device is operating properly and giving accurate results. Copies of the verification shall be retained at the facility site or shall be readily available for review by a TCEQ representative for a period of three years.

6. Compliance Schedule Reports

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date to the regional office and the Enforcement Division (MC 224).

7. Noncompliance Notification

- a. In accordance with 30 TAC §305.125(9) any noncompliance that may endanger human health or safety, or the environment shall be reported by the permittee to the TCEQ. Report of such information shall be provided orally or by facsimile transmission (FAX) to the regional office within 24 hours of becoming aware of the noncompliance. A written submission of such information shall also be provided by the permittee to the regional office and the Enforcement Division (MC 224) within five working days of becoming aware of the noncompliance. For Publicly Owned Treatment Works (POTWs), effective September 1, 2020, the permittee must submit the written report for unauthorized discharges and unanticipated bypasses that exceed any effluent limit in the permit using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.
- b. The following violations shall be reported under Monitoring and Reporting Requirement 7.a.:
 - i. unauthorized discharges as defined in Permit Condition 2(g).
 - ii. any unanticipated bypass that exceeds any effluent limitation in the permit.
 - iii. violation of a permitted maximum daily discharge limitation for pollutants listed specifically in the Other Requirements section of an Industrial TPDES permit.
- c. In addition to the above, any effluent violation that deviates from the permitted effluent limitation by more than 40% shall be reported by the permittee in writing to the regional office and the Enforcement Division (MC 224) within 5 working days of becoming aware of the noncompliance.
- d. Any noncompliance other than that specified in this section, or any required information not submitted or submitted incorrectly, shall be reported to the Enforcement Division (MC 224) as promptly as possible. For effluent limitation violations, noncompliances shall be reported on the approved self-report form.

8. In accordance with the procedures described in 30 TAC §§35.301 - 35.303 (relating to Water Quality Emergency and Temporary Orders) if the permittee knows in advance of the need for a bypass, it shall submit prior notice by applying for such authorization.

9. Changes in Discharges of Toxic Substances

All existing manufacturing, commercial, mining, and silvicultural permittees shall notify the regional office, orally or by facsimile transmission within 24 hours, and both the regional office and the Enforcement Division (MC 224) in writing within five (5) working days, after becoming aware of or having reason to believe:

- a. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) that is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - i. one hundred micrograms per liter (100 µg/L);
 - ii. two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - iii. five (5) times the maximum concentration value reported for that pollutant in the permit application; or
 - iv. the level established by the TCEQ.

- b. That any activity has occurred or will occur that would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant that is not limited in the permit, if that discharge will exceed the highest of the following “notification levels”:
 - i. five hundred micrograms per liter (500 µg/L);
 - ii. one milligram per liter (1 mg/L) for antimony;
 - iii. ten (10) times the maximum concentration value reported for that pollutant in the permit application; or
 - iv. the level established by the TCEQ.

10. Signatories to Reports

All reports and other information requested by the Executive Director shall be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).

11. All POTWs must provide adequate notice to the Executive Director of the following:

- a. any new introduction of pollutants into the POTW from an indirect discharger that would be subject to CWA §301 or §306 if it were directly discharging those pollutants;
- b. any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit; and
- c. for the purpose of this paragraph, adequate notice shall include information on:
 - i. the quality and quantity of effluent introduced into the POTW; and
 - ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

PERMIT CONDITIONS

1. General

- a. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in an application or in any report to the Executive Director, it shall promptly submit such facts or information.
- b. This permit is granted on the basis of the information supplied and representations made by the permittee during action on an application, and relying upon the accuracy and completeness of that information and those representations. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked, in whole or in part, in accordance with 30 TAC Chapter 305, Subchapter D, during its term for good cause including, but not limited to, the following:
 - i. violation of any terms or conditions of this permit;
 - ii. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
 - iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
- c. The permittee shall furnish to the Executive Director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking, suspending, or terminating the permit. The permittee shall also furnish to the Executive Director, upon request, copies of records required to be kept by the permit.

2. Compliance

- a. Acceptance of the permit by the person to whom it is issued constitutes acknowledgment and agreement that such person will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the Commission.
- b. The permittee has a duty to comply with all conditions of the permit. Failure to comply with any permit condition constitutes a violation of the permit and the Texas Water Code or the Texas Health and Safety Code, and is grounds for enforcement action, for permit amendment,

revocation, or suspension, or for denial of a permit renewal application or an application for a permit for another facility.

- c. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.
- d. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal or other permit violation that has a reasonable likelihood of adversely affecting human health or the environment.
- e. Authorization from the Commission is required before beginning any change in the permitted facility or activity that may result in noncompliance with any permit requirements.
- f. A permit may be amended, suspended and reissued, or revoked for cause in accordance with 30 TAC §§305.62 and 305.66 and TWC §7.302. The filing of a request by the permittee for a permit amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- g. There shall be no unauthorized discharge of wastewater or any other waste. For the purpose of this permit, an unauthorized discharge is considered to be any discharge of wastewater into or adjacent to water in the state at any location not permitted as an outfall or otherwise defined in the Other Requirements section of this permit.
- h. In accordance with 30 TAC §305.535(a), the permittee may allow any bypass to occur from a TPDES permitted facility that does not cause permitted effluent limitations to be exceeded or an unauthorized discharge to occur, but only if the bypass is also for essential maintenance to assure efficient operation.
- i. The permittee is subject to administrative, civil, and criminal penalties, as applicable, under Texas Water Code §§7.051 - 7.075 (relating to Administrative Penalties), 7.101 - 7.111 (relating to Civil Penalties), and 7.141 - 7.202 (relating to Criminal Offenses and Penalties) for violations including, but not limited to, negligently or knowingly violating the federal CWA §§301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under the CWA §402, or any requirement imposed in a pretreatment program approved under the CWA §§402(a)(3) or 402(b)(8).

3. Inspections and Entry

- a. Inspection and entry shall be allowed as prescribed in the TWC Chapters 26, 27, and 28, and THSC Chapter 361.
- b. The members of the Commission and employees and agents of the Commission are entitled to enter any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to the quality of water in the state or the compliance with any rule, regulation, permit, or other order of the Commission. Members, employees, or agents of the Commission and Commission contractors are entitled to enter public or private property at any reasonable time to investigate or monitor or, if the responsible party is not responsive or there is an immediate danger to public health or the environment, to remove or remediate a condition related to the quality of water in the state. Members, employees, Commission contractors, or agents acting under this authority who enter private property shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials. If any member, employee, Commission contractor, or agent is refused the right to enter in or on public or private property under this authority, the Executive Director may invoke the remedies authorized in TWC §7.002. The statement above, that Commission entry shall occur in accordance with an establishment's rules and regulations concerning safety, internal security, and fire protection, is not grounds for denial or restriction of entry to any part of the facility, but merely describes the Commission's duty to observe appropriate rules and regulations during an inspection.

4. Permit Amendment or Renewal

- a. The permittee shall give notice to the Executive Director as soon as possible of any planned physical alterations or additions to the permitted facility if such alterations or additions would require a permit amendment or result in a violation of permit requirements. Notice shall also be required under this paragraph when:
 - i. the alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in accordance with 30 TAC §305.534 (relating to New Sources and New Dischargers); or
 - ii. the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in the permit, nor to notification requirements in Monitoring and Reporting Requirements No. 9; or
 - iii. the alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. Prior to any facility modifications, additions, or expansions that will increase the plant capacity beyond the permitted flow, the permittee must apply for and obtain proper authorization from the Commission before commencing construction.
- c. The permittee must apply for an amendment or renewal at least 180 days prior to expiration of the existing permit in order to continue a permitted activity after the expiration date of the permit. If an application is submitted prior to the expiration date of the permit, the existing permit shall remain in effect until the application is approved, denied, or returned. If the application is returned or denied, authorization to continue such activity shall terminate upon the effective date of the action. If an application is not submitted prior to the expiration date of the permit, the permit shall expire and authorization to continue such activity shall terminate.
- d. Prior to accepting or generating wastes that are not described in the permit application or that would result in a significant change in the quantity or quality of the existing discharge, the permittee must report the proposed changes to the Commission. The permittee must apply for a permit amendment reflecting any necessary changes in permit conditions, including effluent limitations for pollutants not identified and limited by this permit.
- e. In accordance with the TWC §26.029(b), after a public hearing, notice of which shall be given to the permittee, the Commission may require the permittee, from time to time, for good cause, in accordance with applicable laws, to conform to new or additional conditions.
- f. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under CWA §307(a) for a toxic pollutant that is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition. The permittee shall comply with effluent standards or prohibitions established under CWA §307(a) for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

5. Permit Transfer

- a. Prior to any transfer of this permit, Commission approval must be obtained. The Commission shall be notified in writing of any change in control or ownership of facilities authorized by this permit. Such notification should be sent to the Applications Review and Processing Team (MC 148) of the Water Quality Division.
- b. A permit may be transferred only according to the provisions of 30 TAC §305.64 (relating to Transfer of Permits) and 30 TAC §50.133 (relating to Executive Director Action on Application or WQMP update).

6. Relationship to Hazardous Waste Activities

This permit does not authorize any activity of hazardous waste storage, processing, or disposal that requires a permit or other authorization pursuant to the Texas Health and Safety Code.

7. Relationship to Water Rights

Disposal of treated effluent by any means other than discharge directly to water in the state must be specifically authorized in this permit and may require a permit pursuant to Texas Water Code Chapter 11.

8. Property Rights

A permit does not convey any property rights of any sort, or any exclusive privilege.

9. Permit Enforceability

The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

10. Relationship to Permit Application

The application pursuant to which the permit has been issued is incorporated herein; provided, however, that in the event of a conflict between the provisions of this permit and the application, the provisions of the permit shall control.

11. Notice of Bankruptcy.

- a. Each permittee shall notify the Executive Director, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of Title 11 (Bankruptcy) of the United States Code (11 USC) by or against:
 - i. the permittee;
 - ii. an entity (as that term is defined in 11 USC, §101(15)) controlling the permittee or listing the permit or permittee as property of the estate; or
 - iii. an affiliate (as that term is defined in 11 USC, §101(2)) of the permittee.
- b. This notification must indicate:
 - i. the name of the permittee;
 - ii. the permit number(s);
 - iii. the bankruptcy court in which the petition for bankruptcy was filed; and
 - iv. the date of filing of the petition.

OPERATIONAL REQUIREMENTS

1. The permittee shall at all times ensure that the facility and all of its systems of collection, treatment, and disposal are properly operated and maintained. This includes, but is not limited to, the regular, periodic examination of wastewater solids within the treatment plant by the operator in order to maintain an appropriate quantity and quality of solids inventory as described in the various operator training manuals and according to accepted industry standards for process control. Process control, maintenance, and operations records shall be retained at the facility site, or shall be readily available for review by a TCEQ representative, for a period of three years.
2. Upon request by the Executive Director, the permittee shall take appropriate samples and provide proper analysis in order to demonstrate compliance with Commission rules. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall comply with all applicable provisions of 30 TAC Chapter 312 concerning sewage sludge use and disposal and 30 TAC §§319.21 - 319.29 concerning the discharge of certain hazardous metals.

3. Domestic wastewater treatment facilities shall comply with the following provisions:
 - a. The permittee shall notify the Municipal Permits Team, Wastewater Permitting Section (MC 148) of the Water Quality Division, in writing, of any facility expansion at least 90 days prior to conducting such activity.
 - b. The permittee shall submit a closure plan for review and approval to the Municipal Permits Team, Wastewater Permitting Section (MC 148) of the Water Quality Division, for any closure activity at least 90 days prior to conducting such activity. Closure is the act of permanently taking a waste management unit or treatment facility out of service and includes the permanent removal from service of any pit, tank, pond, lagoon, surface impoundment or other treatment unit regulated by this permit.
4. The permittee is responsible for installing prior to plant start-up, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, or retention of inadequately treated wastewater.
5. Unless otherwise specified, the permittee shall provide a readily accessible sampling point and, where applicable, an effluent flow measuring device or other acceptable means by which effluent flow may be determined.
6. The permittee shall remit an annual water quality fee to the Commission as required by 30 TAC Chapter 21. Failure to pay the fee may result in revocation of this permit under TWC §7.302(b)(6).
7. Documentation

For all written notifications to the Commission required of the permittee by this permit, the permittee shall keep and make available a copy of each such notification under the same conditions as self-monitoring data are required to be kept and made available. Except for information required for TPDES permit applications, effluent data, including effluent data in permits, draft permits and permit applications, and other information specified as not confidential in 30 TAC §1.5(d), any information submitted pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted in the manner prescribed in the application form or by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, information may be made available to the public without further notice. If the Commission or Executive Director agrees with the designation of confidentiality, the TCEQ will not provide the information for public inspection unless required by the Texas Attorney General or a court pursuant to an open records request. If the Executive Director does not agree with the designation of confidentiality, the person submitting the information will be notified.

8. Facilities that generate domestic wastewater shall comply with the following provisions; domestic wastewater treatment facilities at permitted industrial sites are excluded.
 - a. Whenever flow measurements for any domestic sewage treatment facility reach 75% of the permitted daily average or annual average flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion or upgrading of the domestic wastewater treatment or collection facilities. Whenever the flow reaches 90% of the permitted daily average or annual average flow for three consecutive months, the permittee shall obtain necessary authorization from the Commission to commence construction of the necessary additional treatment or collection facilities. In the case of a domestic wastewater treatment facility that reaches 75% of the permitted daily average or annual average flow for three consecutive months, and the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee shall submit an engineering report supporting this claim to the Executive Director of the Commission.

If in the judgment of the Executive Director the population to be served will not cause permit noncompliance, then the requirement of this section may be waived. To be effective, any waiver must be in writing and signed by the Director of the Enforcement Division (MC 219) of the Commission, and such waiver of these requirements will be reviewed upon expiration of the existing permit; however, any such waiver shall not be interpreted as condoning or excusing any violation of any permit parameter.

- b. The plans and specifications for domestic sewage collection and treatment works associated with any domestic permit must be approved by the Commission, and failure to secure approval before commencing construction of such works or making a discharge is a violation of this permit and each day is an additional violation until approval has been secured.
 - c. Permits for domestic wastewater treatment plants are granted subject to the policy of the Commission to encourage the development of area-wide waste collection, treatment, and disposal systems. The Commission reserves the right to amend any domestic wastewater permit in accordance with applicable procedural requirements to require the system covered by this permit to be integrated into an area-wide system, should such be developed; to require the delivery of the wastes authorized to be collected in, treated by or discharged from said system, to such area-wide system; or to amend this permit in any other particular to effectuate the Commission's policy. Such amendments may be made when the changes required are advisable for water quality control purposes and are feasible on the basis of waste treatment technology, engineering, financial, and related considerations existing at the time the changes are required, exclusive of the loss of investment in or revenues from any then existing or proposed waste collection, treatment or disposal system.
9. Domestic wastewater treatment plants shall be operated and maintained by sewage plant operators holding a valid certificate of competency at the required level as defined in 30 TAC Chapter 30.
10. For Publicly Owned Treatment Works (POTWs), the 30-day average (or monthly average) percent removal for BOD and TSS shall not be less than 85%, unless otherwise authorized by this permit.
11. Facilities that generate industrial solid waste as defined in 30 TAC §335.1 shall comply with these provisions:
- a. Any solid waste, as defined in 30 TAC §335.1 (including but not limited to such wastes as garbage, refuse, sludge from a waste treatment, water supply treatment plant or air pollution control facility, discarded materials, discarded materials to be recycled, whether the waste is solid, liquid, or semisolid), generated by the permittee during the management and treatment of wastewater, must be managed in accordance with all applicable provisions of 30 TAC Chapter 335, relating to Industrial Solid Waste Management.
 - b. Industrial wastewater that is being collected, accumulated, stored, or processed before discharge through any final discharge outfall, specified by this permit, is considered to be industrial solid waste until the wastewater passes through the actual point source discharge and must be managed in accordance with all applicable provisions of 30 TAC Chapter 335.
 - c. The permittee shall provide written notification, pursuant to the requirements of 30 TAC §335.8(b)(1), to the Corrective Action Section (MC 127) of the Remediation Division informing the Commission of any closure activity involving an Industrial Solid Waste Management Unit, at least 90 days prior to conducting such an activity.
 - d. Construction of any industrial solid waste management unit requires the prior written notification of the proposed activity to the Registration and Reporting Section (MC 129) of the Permitting and Remediation Support Division. No person shall dispose of industrial solid waste, including sludge or other solids from wastewater treatment processes, prior to fulfilling the deed recordation requirements of 30 TAC §335.5.
 - e. The term "industrial solid waste management unit" means a landfill, surface impoundment, waste-pile, industrial furnace, incinerator, cement kiln, injection well, container, drum, salt dome waste containment cavern, or any other structure vessel, appurtenance, or other improvement on land used to manage industrial solid waste.
 - f. The permittee shall keep management records for all sludge (or other waste) removed from any wastewater treatment process. These records shall fulfill all applicable requirements of 30 TAC Chapter 335 and must include the following, as it pertains to wastewater treatment and discharge:
 - i. volume of waste and date(s) generated from treatment process;
 - ii. volume of waste disposed of on-site or shipped off-site;
 - iii. date(s) of disposal;

- iv. identity of hauler or transporter;
- v. location of disposal site; and
- vi. method of final disposal.

The above records shall be maintained on a monthly basis. The records shall be retained at the facility site, or shall be readily available for review by authorized representatives of the TCEQ for at least five years.

12. For industrial facilities to which the requirements of 30 TAC Chapter 335 do not apply, sludge and solid wastes, including tank cleaning and contaminated solids for disposal, shall be disposed of in accordance with THSC Code Chapter 361.

TCEQ Revision 05/2021

OTHER REQUIREMENTS

1. Violations of daily maximum limitations for the following pollutants shall be reported orally or by facsimile to TCEQ Region 12 within 24 hours from the time the permittee becomes aware of the violation, followed by a written report within five working days to TCEQ Region 12 and Compliance Monitoring Team (MC 224):

Pollutant	MAL (mg/L)
Acenaphthene	0.010
Acenaphthylene	0.010
Acrylonitrile	0.050
Anthracene	0.010
Benzene	0.010
Benzo(a)anthracene	0.005
3,4-Benzofluoranthene	0.010
(Benzo(b)fluoranthene)	0.010
Benzo(k)fluoranthene	0.005
Benzo(a)pyrene	0.005
Bis(2-Ethylhexyl) Phthalate	0.010
Carbon Tetrachloride	0.002
Chlorobenzene	0.010
Chloroethane	0.050
Chloroform	0.010
Chrysene	0.005
Di-n-Butyl Phthalate	0.010
1,2-Dichlorobenzene	0.010
1,3-Dichlorobenzene	0.010
1,4-Dichlorobenzene	0.010
1,1-Dichloroethane	0.010
1,2-Dichloroethane	0.010
1,1-Dichloroethylene	0.010
1,2-trans-Dichloroethylene	0.010
1,2-Dichloropropane	0.010
1,3-Dichloropropylene	0.010
Diethyl Phthalate	0.010
2,4-Dimethylphenol	0.010
Dimethyl Phthalate	0.010
4,6-Dinitro-o-Cresol	0.050
2,4-Dinitrophenol	0.050
Ethylbenzene	0.010
Fluoranthene	0.010
Fluorene	0.010
Hexachlorobenzene	0.005
Hexachlorobutadiene	0.010
Hexachloroethane	0.020
Methylene Chloride	0.020
Methyl Chloride	0.050
Naphthalene	0.010
Nitrobenzene	0.010
2-Nitrophenol	0.020
4-Nitrophenol	0.050
Phenanthrene	0.010
Phenol	0.010
Pyrene	0.010

Pollutant	MAL (mg/L)
Tetrachloroethylene	0.010
Toluene	0.010
1,2,4-Trichlorobenzene	0.010
1,1,1-Trichloroethane	0.010
1,1,2-Trichloroethane	0.010
Trichloroethylene	0.010
Vinyl Chloride	0.010

Test methods used must be sensitive enough to demonstrate compliance with the permit effluent limitations. If an effluent limit for a pollutant is less than the MAL, then the test method for that pollutant must be sensitive enough to demonstrate compliance at the MAL. Permit compliance/noncompliance determinations will be based on the effluent limitations contained in this permit, with consideration given to the MAL for the pollutants specified above.

When an analysis of an effluent sample for a pollutant listed above indicates no detectable levels above the MAL and the test method detection level is as sensitive as the specified MAL, a value of zero shall be used for that measurement when making calculations for the self-reporting form. This applies to determinations of daily maximum concentration, calculations of loading and daily averages, and other reportable results.

When a reported value is zero based on this MAL provision, the permittee shall submit the following statement with the self-reporting form either as a separate attachment to the form or as a statement in the comments section of the form:

“The reported value(s) of zero for [list pollutant(s)] on the self-reporting form for [monitoring period date range] is based on the following conditions: (1) the analytical method used had a method detection level as sensitive as the MAL specified in the permit, and (2) the analytical results contained no detectable levels above the specified MAL.”

When an analysis of an effluent sample for a pollutant indicates no detectable levels and the test method detection level is not as sensitive as the MAL specified in the permit, or an MAL is not specified in the permit for that pollutant, the level of detection achieved shall be used for that measurement when making calculations for the self-reporting form. A zero may not be used.

2. COOLING WATER INTAKE STRUCTURE REQUIREMENTS

The permittee shall provide written notification to the TCEQ Industrial Permit Team (MC 148) and the Region 12 Office of any change in the method by which the facility obtains water for cooling purposes. This notification must be submitted 30 days prior to any such change and must include a description of the planned changes. The TCEQ may, upon review of the notification, reopen the permit to include additional terms and conditions as necessary.

3. The executive director reviewed this action and found that the action is consistent with the applicable Texas Coastal Management Program (CMP) goals and policies and will not adversely affect any applicable coastal natural resource areas identified by the CMP.
4. Monitoring results shall be provided at the intervals specified in the permit. For pollutants which are monitored annually, effluent reports shall be submitted in September of each year. For pollutants which are monitored twice per year, the first effluent report shall be submitted six months after the date of permit issuance and subsequent reports every six months thereafter. For pollutants which are monitored four times per year, the first effluent report shall be submitted three months after the date of permit issuance and subsequent reports every three months thereafter.

STATEMENT OF BASIS/TECHNICAL SUMMARY AND
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DESCRIPTION OF APPLICATION

Applicant: ChampionX LLC; Texas Pollutant Discharge Elimination System (TPDES)
Permit No. WQ0001806000 (EPA I.D. No. TX0008761)

Regulated activity: Industrial wastewater permit

Type of application: Renewal

Request: Renewal without changes

Authority: Federal Clean Water Act (CWA) §402; Texas Water Code (TWC) §26.027;
30 Texas Administrative Code (TAC) Chapter 305, Subchapters C-F, and
Chapters 307 and 319; commission policies; and Environmental Protection
Agency (EPA) guidelines

EXECUTIVE DIRECTOR RECOMMENDATION

The Executive Director has made a preliminary decision that this permit, if issued, meets all statutory and regulatory requirements. The draft permit will expire at midnight, five years from the date of permit issuance according to the requirements of 30 TAC §305.127(1)(C)(i).

REASON FOR PROJECT PROPOSED

The applicant applied to the Texas Commission on Environmental Quality (TCEQ) for a renewal of its existing permit.

PROJECT DESCRIPTION AND LOCATION

The applicant currently operates ChampionX Freeport Plant, a chemical manufacturing plant.

The wastewater consists of process wastewater (process condensate, scrubber blowdown water, process equipment/area wash water, flare seal water, water contained in raw materials, laboratory wastewater, and potentially contaminated stormwater that is collected within the plant's curbed storage and process areas. The operations are conducted in batch mode. The wastewater is pumped to Tank 211, which is a 158,000-gallon wastewater equalization holding tank. This tank is used to equalize the flow to the wastewater treatment unit. The process wastewater is treated in an on-site activated carbon biological treatment unit. Treatment units include biological oxidation, carbon adsorption, clarification, and sludge storage. Wastewater is pumped to the aeration tank where virgin powdered carbon and nutrients are added. The mixed liquor from the aeration tank flows to a circular clarifier where the solids are allowed to settle. Liquid cationic polymer is added to the clarifier influent to aid in solids settling.

Clarifier underflow solids are recycled back to the aeration tank on a continuous basis to maintain the required mixed liquor solids concentration. The solids are pumped to the aerated sludge storage tank.

Drainage from potentially chemically contaminated process area is controlled as follows: all potentially chemically contaminated process areas are routed through drains to chemical sumps A, B, C, D, E, F, G, H, J, or K. These sumps have automatic level controls and are pumped to the wastewater system feed tank (Tank 211). The water from the chemical sump can either be stopped at the sump and evacuated to another container or be allowed to enter the treatment process. Under severe storm conditions, each sump can be pumped completely to Tank 211.

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Drainage from low contamination process areas is collected as follows: all low contamination process areas are routed through trenches and ditches to stormwater sumps 1, 2, 3, 4, 5, 6, or 7. These sumps have automatic level controls and are pumped to stormwater Tank-722. Before pumping the contents of TK-722, the tank is circulated, sampled, and analyzed for pH and total organic carbon (TOC).

The facility is located at 2322 County Road 229, in the City of Freeport, Brazoria County, Texas 77541.

Discharge Routes and Designated Uses

The effluent is discharged via Outfall 001 to Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River Basin; via Outfalls 002, 003, and 004 to unnamed ditches, thence to the Old Brazos River Channel Tidal in Segment No. 1111 of the San-Jacinto Brazos Coastal Basin; and via Outfall 005 either to an unnamed ditch which flows to a pumping station, thence to the Dow Chemical Plant "A" Effluent Canal, thence to the Brazos River Tidal in Segment No. 1201 of the Brazos River Basin, or from the pumping station to the Dow Barge Canal, thence to Old Brazos River Channel Tidal in Segment No. 1111 of the San Jacinto-Brazos Coastal Basin. The unclassified receiving water uses are minimal aquatic life use for the unnamed ditches and high aquatic life use for the Dow Barge Canal. The designated uses for Segment No. 1111 are primary contact recreation and high aquatic life use. The designated uses for Segment No. 1201 are primary contact recreation, public water supply, and high aquatic life use. The public water supply designation for Segment No. 1201 only applies from the upstream boundary to 300 meters (330 yards) downstream of SH 332 in Brazoria County. Public water supply designation for Segment No. 1201 ends 17 miles upstream of Dow Canal outlet, public water supply criterion does not apply at the Dow Canal outlet. The effluent limits in the draft permit will maintain and protect the existing instream uses. All determinations are preliminary and subject to additional review and revisions.

Endangered Species Review

The discharge from this permit action is not expected to have an effect on any federal endangered or threatened aquatic or aquatic dependent species or proposed species or their critical habitat. This determination is based on the United States Fish and Wildlife Service's (USFWS) biological opinion on the State of Texas authorization of the Texas Pollutant Discharge Elimination System (TPDES; September 14, 1998; October 21, 1998 update) program. To make this determination for TPDES permits, TCEQ and EPA only considered aquatic or aquatic dependent species occurring in watersheds of critical concern or high priority as listed in Appendix A of the USFWS biological opinion. Though the piping plover, *Charadrius melodus* Ord, can occur in Brazoria County, the county is north of Copano Bay and not a watershed of high priority per Appendix A of the biological opinion. The determination is subject to reevaluation due to subsequent updates or amendments to the biological opinion. The permit does not require EPA review with respect to the presence of endangered or threatened species.

Impaired Water Bodies

Segment No. 1111 is not currently listed on the state's inventory of impaired and threatened waters, the 2022 CWA §303(d) list.

Segment No. 1201 is not currently listed on the state's inventory of impaired and threatened waters, the 2022 CWA §303(d) list.

Completed Total Maximum Daily Loads (TMDLs)

There are no completed TMDLs for Segment Nos. 1111 and 1201.

Dissolved Oxygen

Only internal Outfall 101 is expected to discharge wastewater (including process wastewater, domestic wastewater, utility wastewater) with significant concentrations of oxygen demanding substances. A

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dissolved oxygen modeling analysis was previously performed for this permit on January 31, 2019, by Mark A. Rudolph. Applicable water body uses and criterion, proposed permitted flow conditions, and modeling analytical procedures pertaining to this discharge situation remain unchanged from the previous review. Therefore, the existing effluent limit of 1.6 lbs/day CBOD₅ is applicable to this permit.

SUMMARY OF EFFLUENT DATA

The following is a quantitative description of the discharge described in the monthly effluent report data for the period April 2019 through March 2024. The "Avg of Daily Avg" values presented in the following table are the average of all daily average values for the reporting period for each pollutant. The "Max of Daily Max" values presented in the following table are the individual maximum values for the reporting period for each pollutant. Flows are expressed in million gallons per day (MGD). All pH values are expressed in standard units (SU). Bacteria values are expressed in colony forming units (CFU) or most probable number (MPN) per 100 milliliters (mL).

Flow

Outfall	Frequency	Avg of Daily Avg, MGD	Max of Daily Max, MGD
001	Continuous	1.17	9060
101	Continuous	0.005	0.039
201	Intermittent	1.76	28.8
301	No discharge reported during this reporting period.		
002	Intermittent	0.089	0.243
003	No discharge reported during this reporting period.		
004	No discharge reported during this reporting period.		
005	No discharge reported during this reporting period.		

Effluent Characteristics

Outfall	Pollutant	Avg of Daily Avg	Max of Daily Max
		lbs/day	lbs/day
001	pH	6.23 SU, minimum	9.78 SU
101	Carbonaceous Biochemical Oxygen Demand, 5-day (CBOD ₅)	0.032	2.86
	Total Suspended Solids (TSS)	0.227	4.32
	Chemical Oxygen Demand (COD)	-	23.8
	Oil and Grease (O&G)	0.044	1.44
	Ammonia Nitrogen	0.038	4.54
	Acenaphthene	0	0
	Acenaphthylene	0	0
	Acrylonitrile	0	0
	Anthracene	0	0
	Benzene	0	0
	Benzo(a)anthracene	0	0
	3,4-Benzofluoranthene	0	0
	Benzo(k)fluoranthene	0	0
	Benzo(a)pyrene	0	0
	Carbon Tetrachloride	0	0
	Chlorobenzene	0	0
	Chloroethane	0	0
	Chloroform	0	0

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Effluent Characteristics

Outfall	Pollutant	Avg of Daily Avg	Max of Daily Max
		lbs/day	lbs/day
101	2-Chlorophenol	0	0
	Chrysene	0	0
	Di-n-butyl phthalate	0.00003	0.0004
	1,2-Dichlorobenzene	0	0
	1,3-Dichlorobenzene	0	0
	1,4-Dichlorobenzene	0	0
	1,1-Dichloroethane	0	0
	1,2-Dichloroethane	0	0
	1,1-Dichloroethylene	0	0
	1,2-trans-Dichloroethylene	0	0
	2,4-Dichlorophenol	0	0
	1,2-Dichloropropane	0	0
	1,3-Dichloropropylene	0	0
	Diethyl phthalate	0	0
	2,4-Dimethylphenol	0	0
	Dimethyl phthalate	0	0
	4,6-Dinitro-o-cresol	0	0
	2,4-Dinitrophenol	0	0
	2,4-Dinitrotoluene	0	0
	2,6-Dinitrotoluene	0	0
	Ethylbenzene	0	0
	Fluoranthene	0	0
	Fluorene	0	0
	Hexachlorobenzene	0	0
	Hexachlorobutadiene	0	0
	Hexachloroethane	0	0
	Methyl Chloride	0	0
	Methylene Chloride	0	0
	Naphthalene	0.0001	0.0006
	Nitrobenzene	0	0
	2-Nitrophenol	0	0
	4-Nitrophenol	0	0
	Phenanthrene	0	0
	Phenol	0	0
	Pyrene	0	0
	Tetrachloroethylene	0	0
	Toluene	0	0
	1,2,4-Trichlorobenzene	0	0
	1,1,1-Trichloroethane	0	0
	1,1,2-Trichloroethane	0	0
	Trichloroethylene	0	0
	Vinyl Chloride	0	0
	Enterococci	129 CFU/100 mL	7400 CFU/100 mL

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Effluent Characteristics

Outfall	Pollutant	Avg of Daily Avg	Max of Daily Max
		mg/L	mg/L
201	Chemical Oxygen Demand	-	240
	Oil and Grease	-	14.9
002	Chemical Oxygen Demand	-	29
	Oil and Grease	-	3.0
	pH	7.48 SU, minimum	8.11 SU

Effluent limit violations documented in the monthly effluent reports are summarized in the following table.

Effluent Limitation Violations

Outfall	Pollutant (units)	Report Date	Daily Average		Daily Maximum	
			Limit	Reported	Limit	Reported
001	pH (SU)	6/2023	-	-	9.0	9.76
		7/2023	-	-		9.78
101	Enterococci (CFU/100mL)	2/2023	35	-	130	601
		3/2023		43.1		1200
		5/2023		2400		2400
		9/2023		-		7400
		1/2024		176		6100
		2/2024		66.4		-
201	COD	6/2021	-	-	200	240

The draft permit was not changed to address these effluent limit violations because of their infrequent nature.

DRAFT PERMIT CONDITIONS

The draft permit authorizes the discharge of previously monitored effluents (PMEs) (process wastewater, domestic wastewater, utility wastewater, stormwater, and treated groundwater) on an flow-variable basis via Outfall 001; process wastewater, domestic wastewater, and utility wastewater at a daily average flow not to exceed 0.0236 MGD via internal Outfall 101; stormwater on an intermittent and flow-variable basis via internal Outfall 201; treated groundwater at a daily average flow not to exceed 0.030 MGD via internal Outfall 301; and stormwater on an intermittent and flow-variable basis via Outfalls 002, 003, 004, and 005. See Appendix B for a comparison of calculated technology-based effluent limitations, water quality-based effluent limitations, existing effluent limitations, and the proposed final effluent limitations established in the draft permit.

OUTFALL LOCATIONS

Outfall	Latitude	Longitude
001	28.960013 N	95.335085 W
101	28.959794 N	92.335967 W
201	28.959556 N	95.336044 W
301	28.959594 N	95.336097 W
002	28.958291 N	95.336599 W

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003	28.960273 N	95.338597 W
004	28.960845 N	95.338712 W
005	28.958305 N	95.332542 W

Technology-Based Effluent Limitations

Regulations in Title 40 of the Code of Federal Regulations (40 CFR) require that technology-based limitations be placed in wastewater discharge permits based on effluent limitations guidelines, where applicable, or on best professional judgment (BPJ) in the absence of guidelines. Technology-based effluent limitations from 40 CFR Part 414, Subparts E, F, G, H, and I apply to the discharge of process wastewater via internal Outfall 101 from this facility. Development of technology-based effluent limitations is presented in Appendix A.

Water Quality-Based Effluent Limitations

Calculations of water quality-based effluent limitations for the protection of aquatic life and human health are covered under TPDES Permit No. WQ0000007000. There are no critical conditions established for the discharge from Outfall 001 to the Dow Chemical Plant "A" Effluent Canal. Critical conditions apply where the Dow canal discharges into the Brazos River.

Stormwater runoff is authorized to discharge via Outfalls 002, 003, 004, and 005. Typically, critical conditions are not developed for stormwater runoff outfalls, as this is standard TCEQ practice. Therefore, no water quality criteria screening was performed for these outfalls.

Bacteria Standard Protection

Domestic wastewater is discharged via internal Outfall 101. Based on 30 TAC 307, protection from exposure to human pathogens is required. Current agency policy is to impose appropriate effluent limitations for Enterococci for discharges of treated domestic wastewater directly to marine receiving waters or to freshwater bodies within three (3) miles of marine receiving waters. Effluent limitations for Enterococci at internal Outfall 101 were carried forward to the draft permit based on antibacksliding requirements and originally placed in the permit per 30 TAC §307.7(b)(1)(B)(i) and 30 TAC §309.3(h)(2) and 30 TAC §309.3(h)(3).

Total Dissolved Solids (TDS), Chloride, and Sulfate Screening

Outfall 001

TDS, Chloride, and Sulfate screening for Outfall 001 is covered under TPDES Permit No. WQ0000007000.

Outfalls 002, 003, 004, and 005

Segment Nos. 1111 and No. 1201, which receives the discharges from Outfalls 002, 003, 004, and 005 from this facility, does not have criteria established for TDS, chloride, or sulfate in 30 TAC Chapter 307; therefore, no screening was performed for TDS, chloride, or sulfate in the effluent.

pH Screening

The existing permit includes pH limits of 6.0 – 9.0 SU at Outfalls 001, 002, 003, 004, and 005, which discharges to various unclassified water bodies. Consistent with the procedures for pH screening that were submitted to EPA with a letter dated May 28, 2014, and approved by EPA in a letter dated June 2, 2014, requiring a discharge to an unclassified water body to meet pH limits of 6.0 – 9.0 standard

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units reasonably ensures instream compliance with *Texas Surface Water Quality Standards* pH criteria.

316(b) Cooling Water Intake Structures

The facility obtains cooling water from a third party that currently holds TPDES Permit No. WQ0000007000. The facility itself does not own or operate a cooling water intake structure as defined in 40 CFR Part 125, Subpart I or J. Applicable statutes and regulations for cooling water intake structures are addressed in TPDES Permit No. WQ0000007000. This determination is subject to change in the event TPDES Permit No. WQ0000007000 is cancelled for any reason or the facility changes the method by which cooling water is obtained.

The Other Requirement No. 3 has been carried forward from the existing permit as Other Requirement No. 2 and requires the permittee to notify the TCEQ of any changes in the method by which cooling water is obtained. Upon receipt of such notification, the TCEQ may reopen the permit to include additional terms and conditions as necessary.

Whole Effluent Toxicity Testing (Biomonitoring)

Biomonitoring requirements are not included in the draft permit. Application of water quality standards (including biomonitoring) are addressed in the Dow WQ0000007000 permit and not applied to this permit.

SUMMARY OF CHANGES FROM APPLICATION

No changes were made from the application.

SUMMARY OF CHANGES FROM EXISTING PERMIT

The following changes have been made to the draft permit.

1. Pages 3-13 were updated (May 2021 version).
2. Application and Core Data form only reports a primary SIC of 2869.
3. Flow characterization on page 2 was changed from intermittent and flow-variable to just flow-variable.
4. Other Requirement No. 1 has been completed and not carried forward to the draft permit. Other Requirements Nos. 2-5 were carried forward and renumbered 1-4.
5. Other Requirement No. 2 was updated in the draft permit to address cooling water intake structure requirements under CWA §316(b). Although CWA §316(b) does not currently apply to this facility, the applicant would be required to notify the TCEQ if there is a change in how the facility obtains cooling water.

BASIS FOR DRAFT PERMIT

The following items were considered in developing the draft permit:

1. Application received on March 20, 2024, and additional information received on April 25, 2024.
2. Existing permits: TPDES Permit No. WQ0001806000 issued on February 26, 2021.
3. TCEQ Rules.
4. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective March 1, 2018, as approved by EPA Region 6.

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5. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective March 6, 2014, as approved by EPA Region 6, for portions of the 2018 standards not approved by EPA Region 6.
6. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective July 22, 2010, as approved by EPA Region 6, for portions of the 2014 standards not approved by EPA Region 6.
7. *Texas Surface Water Quality Standards* – 30 TAC §§307.1-307.10, effective August 17, 2000, and Appendix E, effective February 27, 2002, for portions of the 2010 standards not approved by EPA Region 6.
8. *Procedures to Implement the Texas Surface Water Quality Standards* (IPs), Texas Commission on Environmental Quality, June 2010, as approved by EPA Region 6.
9. *Procedures to Implement the Texas Surface Water Quality Standards*, Texas Commission on Environmental Quality, January 2003, for portions of the 2010 IPs not approved by EPA Region 6.
10. Memos from the Standards Implementation Team and Water Quality Assessment Team of the Water Quality Assessment Section of the TCEQ.
11. *Guidance Document for Establishing Monitoring Frequencies for Domestic and Industrial Wastewater Discharge Permits*, TCEQ Document No. 98-001.000-OWR-WQ, May 1998.
12. EPA Effluent Guidelines: 40 CFR Part 414, Subparts E, F, G, H, and I (NSPS). A new source determination was performed and the discharge is a new source as defined at 40 CFR §122.2.
13. Consistency with the Coastal Management Plan: The executive director has reviewed this action for consistency with the goals and policies of the Texas Coastal Management Program (CMP) in accordance with the regulations of the General Land Office and has determined that the action is consistent with the applicable CMP goals and policies.
14. Letter dated May 28, 2014, from L'Oreal W. Stepney, P.E., Deputy Director, Office of Water, TCEQ, to Bill Honker, Director, Water Quality Protection Division, EPA (TCEQ proposed development strategy for pH evaluation procedures).
15. Letter dated June 2, 2014, from William K. Honker, P.E., Director, Water Quality Protection Division, EPA, to L'Oreal W. Stepney, P.E., Deputy Director, Office of Water, TCEQ (Approval of TCEQ proposed development strategy for pH evaluation procedures).

PROCEDURES FOR FINAL DECISION

When an application is declared administratively complete, the chief clerk sends a letter to the applicant advising the applicant to publish the Notice of Receipt of Application and Intent to Obtain Permit in the newspaper. In addition, the Chief Clerk instructs the applicant to place a copy of the application in a public place for reviewing and copying in the county where the facility is or will be located. This application will be in a public place throughout the comment period. The Chief Clerk also mails this notice to any interested persons and, if required, to landowners identified in the permit application. This notice informs the public about the application and provides that an interested person may file comments on the application or request a contested case hearing or a public meeting.

Once a draft permit is completed, it is sent to the Chief Clerk, along with the Executive Director's preliminary decision contained in the technical summary or fact sheet. At that time, the Notice of Application and Preliminary Decision will be mailed to the same people and published in the same newspaper as the prior notice. This notice sets a deadline for making public comments. The applicant must place a copy of the Executive Director's preliminary decision and draft permit in the public place with the application.

Any interested person may request a public meeting on the application until the deadline for filing public comments. A public meeting is intended for the taking of public comment and is not a contested case hearing.

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After the public comment deadline, the Executive Director prepares a response to all significant public comments on the application or the draft permit raised during the public comment period. The Chief Clerk then mails the Executive Director's response to comments and final decision to people who have filed comments, requested a contested case hearing, or requested to be on the mailing list. This notice provides that if a person is not satisfied with the Executive Director's response and decision, they can request a contested case hearing or file a request to reconsider the Executive Director's decision within 30 days after the notice is mailed.

The Executive Director will issue the permit unless a written hearing request or request for reconsideration is filed within 30 days after the Executive Director's response to comments and final decision is mailed. If a hearing request or request for reconsideration is filed, the Executive Director will not issue the permit and will forward the application and request to the TCEQ commissioners for their consideration at a scheduled commission meeting. If a contested case hearing is held, it will be a legal proceeding similar to a civil trial in state district court.

If the Executive Director calls a public meeting or the commission grants a contested case hearing as described above, the commission will give notice of the date, time, and place of the meeting or hearing. If a hearing request or request for reconsideration is made, the commission will consider all public comments in making its decision and shall either adopt the Executive Director's response to public comments or prepare its own response.

For additional information about this application, contact Thomas E. Starr at (512) 239-4570.

Thomas E. Starr
Thomas E. Starr, P.E.

July 8, 2024
Date

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Appendix A
Calculated Technology-Based Effluent Limits

New Source Determination

ChampionX LLC operates the ChampionX Freeport Plant, a chemical manufacturing facility, which treats and discharges wastewater from the production of organic chemicals, plastics, and synthetic fibers. The permittee is authorized to discharge process wastewater, domestic wastewater, and utility wastewater at a daily average flow not to exceed 0.0236 MGD via internal Outfall 101. The discharge of process wastewater is subject to 40 CFR Part 414 – Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF), Subparts E, F, G, H, and I.

The facility has been operating since 1988. The discharge of process wastewater is subject to effluent limitation guidelines (ELGs), and is a new source as defined in 40 CFR §122.2.

The following wastestreams are commingled and treated with biological treatment; therefore the total flow was used to calculate the mass loading effluent limitations. According to the "Development Document for Effluent Limitations and Guidelines and Standards for OCPSF Point Source Category, Vol. I, EPA 440/1-87/009, October 1987, Table VII-50, page VII-157, process area stormwater, miscellaneous non-process wastewater, and domestic wastewater are considered to be process wastewater for the purpose of allocating pollutant loads limited in 40 CFR Part 414.

Wastestream Contribution

Outfall	Wastestream	Volume
101	Process wastewater	0.018
	Contaminated Stormwater	0.002
	Laboratory Process wastewater	0.0014
	Treated water in raw material	0.00095
	Total Process Wastewaters	0.02235
	Non-contaminated Stormwater	0.075
	Cooling Tower Blowdown	
	Non-contact steam condensate	
	Total Utility Wastewaters	0.075
	Domestic wastewater	0.001
Total Volume		0.09835 MGD

Example Calculation:

Daily Average BOD₅ (lbs/day) = Flow (MGD) × BOD₅ conc. × 8.345¹ × Proportion

$$= 0.02235 \text{ MGD} \times 61 \text{ mg/L} \times 8.345 \times 0.135 = 1.54 \text{ lbs/day}$$

$$\text{Daily Maximum BOD}_5 \text{ (lbs/day)} = 0.02235 \text{ MGD} \times 163 \text{ mg/L} \times 8.345 \times 0.135 = 4.10 \text{ lbs/day}$$

¹ Conversion Factor

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BOD₅

Applicability	Proportion ²	ELGs Daily Average	ELG Daily Maximum	Calc Daily Average Tech- Based Limit	Calc Daily Maximum Tech- Based Limit
		mg/L	mg/L	lbs/day	lbs/day
Subpart E	0.135	61	163	1.54	4.10
Subpart F	0.20	30	80	1.12	2.98
Subpart G	0.46	34	92	2.92	7.89
Subpart H	0.205	45	120	1.72	4.59
Total	1.0			7.3	19.56

TSS

Applicability	Proportion	Daily Average	Daily Maximum	Calc Daily Average Tech- Based Limit	Calc Daily Maximum Tech- Based Limit
		mg/L	mg/L	lbs/day	lbs/day
Subpart E	0.135	67	216	1.69	5.44
Subpart F	0.20	46	149	1.72	5.56
Subpart G	0.46	49	159	4.20	13.6
Subpart H	0.205	57	183	2.18	7.00
Total				9.79	31.6

pH - Effluent limitations for pH are based on Best Practicable Control Technology (BPT) for all 40 CFR 414 Subparts E, F, G, and H. The pH effluent limitations shall be within the range of 6.0 and 9.0 standard units.

Internal Outfall 101

Subpart I Calculations (NSPS Effluent Limitations for the OCPSF Point Source Category – 40 CFR § 414.91 Subpart I)

Based on information submitted in the application, the facility does not generate cyanide-bearing waste streams nor metal bearing wastestreams.

Total (Permitted Daily Average) Flow from Outfall 101:	0.0236 MGD
Subpart I Process Wastewater Flow:	0.02235 MGD
Metal-Bearing Wastewater Flow	0.00 MGD
Cyanide Bearing Wastewater Flow:	0.00 MGD

Mass allocations for the toxic pollutants limited in Subpart I were calculated as follows:

$$\text{Dly Avg (lbs/day)} = [\text{Dly Avg } (\mu\text{g/L})/1000] \times [\text{process wastewater flow (MGD)}] \times 8.345$$

$$\text{Dly Max (lbs/day)} = [\text{Dly Max } (\mu\text{g/L})/1000] \times [\text{process wastewater flow (MGD)}] \times 8.345$$

Subpart I process wastewater flow

Single Grab concentrations were calculated as follows:

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Single Grab (mg/L) = Dly Max. (conc.) / 1000 × process wastewater flow (MGD) / total flow (MGD)
× 1.5

Parameter	Dly Avg µg/L	Dly Max µg/L	Dly Avg lbs/day	Dly Max lbs/day	Single Grab mg/L
Acenaphthene	22	59	0.00410	0.0110	0.0885
Acenaphthylene	22	59	0.00410	0.0110	0.0885
Acrylonitrile	96	242	0.0179	0.0451	0.363
Anthracene	22	59	0.00410	0.0110	0.0885
Benzene	37	136	0.00690	0.0254	0.204
Benzo(a)anthracene	22	59	0.00410	0.0110	0.0885
3,4-Benzofluoranthene	23	61	0.00429	0.0114	0.0915
Benzo(k)fluoranthene	22	59	0.00410	0.0110	0.0885
Benzo(a)pyrene	23	61	0.00429	0.0114	0.0915
Bis(2-ethylhexyl)phthalate	103	279	0.0192	0.0520	0.419
Carbon Tetrachloride	18	38	0.00336	0.00709	0.0570
Chlorobenzene	15	28	0.00280	0.00522	0.0420
Chloroethane	104	268	0.0194	0.0500	0.402
Chloroform	21	46	0.00392	0.00857	0.0503
2-Chlorophenol	31	98	0.00578	0.0183	0.107
Chrysene	22	59	0.00410	0.0110	0.0645
Di-n-butyl Phthalate	27	57	0.00504	0.00106	0.0623
1,2-Dichlorobenzene	77	163	0.0144	0.0304	0.178
1,3-Dichlorobenzene	31	44	0.00578	0.00821	0.0481
1,4-Dichlorobenzene	15	28	0.00280	0.00522	0.0420
1,1-Dichloroethane	22	59	0.00410	0.0110	0.0885
1,2-Dichloroethane	68	211	0.0127	0.0394	0.230
1,1-Dichloroethylene	16	25	0.00298	0.00466	0.0273
1,2-trans Dichloroethylene	21	54	0.00392	0.0101	0.0590
2,4-Dichlorophenol	39	112	0.00727	0.0209	0.122
1,2-Dichloropropane	153	230	0.0285	0.0429	0.251
1,3-Dichloropropylene	29	44	0.00541	0.00821	0.0481
Diethyl Phthalate	81	203	0.00151	0.0379	0.222
2,4-Dimethylphenol	18	36	0.00336	0.00709	0.0393
Dimethyl Phthalate	19	47	0.00354	0.00877	0.0513
4,6-Dinitro-o-cresol	78	277	0.0145	0.0517	0.303
2,4-Dinitrophenol	71	123	0.0132	0.0229	0.134
2,4-Dinitrotoluene	113	285	0.0211	0.0532	0.311
2,6-Dinitrotoluene	225	641	0.0420	0.120	0.700
Ethylbenzene	32	108	0.00597	0.0201	0.118
Fluoranthene	25	68	0.00466	0.0127	0.0743
Fluorene	22	59	0.00410	0.0110	0.0885
Hexachlorobenzene	15	28	0.00280	0.00522	0.0420
Hexachlorobutadiene	20	49	0.00373	0.00914	0.0523
Hexachloroethane	21	54	0.00392	0.0101	0.0855
Methyl Chloride	86	190	0.0160	0.0354	0.208
Methylene Chloride	40	89	0.00746	0.0166	0.0972
Naphthalene	22	59	0.00410	0.0110	0.0885
Nitrobenzene	27	68	0.00504	0.00127	0.0743

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Parameter	Dly Avg µg/L	Dly Max µg/L	Dly Avg lbs/day	Dly Max lbs/day	Single Grab mg/L
2-Nitrophenol	41	69	0.00748	0.00129	0.0773
4-Nitrophenol	72	124	0.0134	0.0231	0.135
Phenanthrene	22	59	0.00410	0.0110	0.0885
Phenol	15	26	0.00280	0.00468	0.0283
Pyrene	25	67	0.00466	0.00537	0.0725
Tetrachloroethylene	22	56	0.00410	0.0103	0.0855
Toluene	26	80	0.00468	0.0159	0.0874
1,2,4-Trichlorobenzene	68	140	0.0127	0.0279	0.151
1,1,1-Trichloroethane	21	54	0.00392	0.0101	0.0855
1,1,2-Trichloroethane	21	54	0.00392	0.0101	0.0855
Trichloroethylene	21	54	0.00392	0.0101	0.0855
Vinyl Chloride	104	268	0.0194	0.0500	0.293

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Appendix B
Comparison of Technology-Based Effluent Limits and Water Quality-Based Effluent Limits

The following table is a summary of technology-based effluent limitations calculated/assessed in the draft permit (Technology-Based), calculated/assessed water quality-based effluent limitations (Water Quality-Based), and effluent limitations in the existing permit (Existing Permit). Effluent limitations appearing in bold are the most stringent of the three and are included in the draft permit.

Outfall	Pollutant	Technology-Based				Water Quality-Based				Existing Permit			
		Daily Avg		Daily Max		Daily Avg		Daily Max		Daily Avg		Daily Max	
		lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L
001	Flow	N/A		N/A		N/A		N/A		Report, MGD		Report, MGD	
	pH	6.0 SU (min)		9.0 SU (max)		N/A		N/A		6.0 SU (min)		9.0 SU (max)	
101	Flow	N/A		N/A		N/A		N/A		0.0236 MGD		0.050 MGD	
	Biochemical Oxygen Demand, 5-day	7.3	N/A	19.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Carbonaceous Biochemical Oxygen Demand, 5-day	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	1.6	N/A	4.1	N/A
	Total suspended Solids	9.79	N/A	31.6	N/A	N/A	N/A	N/A	N/A	2.7	N/A	8.2	N/A
	Chemical Oxygen Demand	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	78	N/A
	Oil and Grease	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	N/A	3.0	N/A
	Ammonia Nitrogen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Report	N/A	Report	N/A
	Acenaphthene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Acenaphthylene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Acrylonitrile	0.0179	N/A	0.0451	N/A	N/A	N/A	N/A	N/A	0.005	N/A	0.012	N/A
	Anthracene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Benzene	0.00690	N/A	0.0254	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.006	N/A
	Benzo(a)anthracene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	3,4-Benzofluoranthene	0.00429	N/A	0.0114	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Benzo(k)fluoranthene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Benzo(a)pyrene	0.00429	N/A	0.0114	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Bis(2-ethylhexyl) phthalate	0.0192	N/A	0.0520	N/A	N/A	N/A	N/A	N/A	0.005	N/A	0.013	N/A
	Carbon Tetrachloride	0.00336	N/A	0.00709	N/A	N/A	N/A	N/A	N/A	0.0009	N/A	0.002	N/A
	Chlorobenzene	0.00280	N/A	0.00522	N/A	N/A	N/A	N/A	N/A	0.0007	N/A	0.001	N/A

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		Daily Avg		Daily Max		Daily Avg		Daily Max		Daily Avg		Daily Max	
		lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L
101	Chloroethane	0.0194	N/A	0.0500	N/A	N/A	N/A	N/A	N/A	0.005	N/A	0.013	N/A
	Chloroform	0.00392	N/A	0.00857	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.002	N/A
	2-Chlorophenol	0.00578	N/A	0.0183	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.005	N/A
	Chrysene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Di-n-butyl phthalate	0.00504	N/A	0.00106	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	1,2-Dichlorobenzene	0.0144	N/A	0.0304	N/A	N/A	N/A	N/A	N/A	0.004	N/A	0.008	N/A
	1,3-Dichlorobenzene	0.00578	N/A	0.00821	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.002	N/A
	1,4-Dichlorobenzene	0.00280	N/A	0.00522	N/A	N/A	N/A	N/A	N/A	0.0007	N/A	0.001	N/A
	1,1-Dichloroethane	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	1,2-Dichloroethane	0.0127	N/A	0.0394	N/A	N/A	N/A	N/A	N/A	0.003	N/A	0.01	N/A
	1,1-Dichloroethylene	0.00298	N/A	0.00466	N/A	N/A	N/A	N/A	N/A	0.0008	N/A	0.001	N/A
	1,2-trans-Dichloroethylene	0.00392	N/A	0.0101	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	2,4-Dichlorophenol	0.00727	N/A	0.0209	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.005	N/A
	1,2-Dichloropropane	0.0285	N/A	0.0429	N/A	N/A	N/A	N/A	N/A	0.007	N/A	0.011	N/A
	1,3-Dichloropopylene	0.00541	N/A	0.00821	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.002	N/A
	Diethyl phthalate	0.00151	N/A	0.0379	N/A	N/A	N/A	N/A	N/A	0.004	N/A	0.010	N/A
	2,4-Dimethylphenol	0.00336	N/A	0.00709	N/A	N/A	N/A	N/A	N/A	0.0009	N/A	0.002	N/A
	Dimethyl phthalate	0.00354	N/A	0.00877	N/A	N/A	N/A	N/A	N/A	0.0009	N/A	0.002	N/A
	4,6-Dinitro-o-cresol	0.0145	N/A	0.0517	N/A	N/A	N/A	N/A	N/A	0.004	N/A	0.013	N/A
	2,4-Dinitrophenol	0.0132	N/A	0.0229	N/A	N/A	N/A	N/A	N/A	0.003	N/A	0.006	N/A
	2,4-Dinitrotoluene	0.0211	N/A	0.0532	N/A	N/A	N/A	N/A	N/A	0.005	N/A	0.014	N/A
	2,6-Dinitrotoluene	0.0420	N/A	0.120	N/A	N/A	N/A	N/A	N/A	0.012	N/A	0.030	N/A
	Ethylbenzene	0.00597	N/A	0.0201	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.005	N/A
	Fluoranthene	0.00466	N/A	0.0127	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Fluorene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Hexachlorobenzene	0.00280	N/A	0.00522	N/A	N/A	N/A	N/A	N/A	0.0007	N/A	0.001	N/A
	Hexachlorobutadiene	0.00373	N/A	0.00914	N/A	N/A	N/A	N/A	N/A	0.0009	N/A	0.002	N/A
	Hexachloroethane	0.00392	N/A	0.0101	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Methyl Chloride	0.0160	N/A	0.0354	N/A	N/A	N/A	N/A	N/A	0.004	N/A	0.009	N/A
	Methylene Chloride	0.00746	N/A	0.0166	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.004	N/A
	Naphthalene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A

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		Daily Avg		Daily Max		Daily Avg		Daily Max		Daily Avg		Daily Max	
		lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L
101	Nitrobenzene	0.00504	N/A	0.00127	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	2-Nitrophenol	0.00748	N/A	0.00129	N/A	N/A	N/A	N/A	N/A	0.002	N/A	0.003	N/A
	4-Nitrophenol	0.0134	N/A	0.0231	N/A	N/A	N/A	N/A	N/A	0.003	N/A	0.006	N/A
	Phenanthrene	0.00410	N/A	0.0110	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Phenol	0.00280	N/A	0.00468	N/A	N/A	N/A	N/A	N/A	0.0007	N/A	0.001	N/A
	Pyrene	0.00466	N/A	0.00537	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Tetrachloroethylene	0.00410	N/A	0.0103	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Toluene	0.00468	N/A	0.0159	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.004	N/A
	1,2,4-Trichlorobenzene	0.0127	N/A	0.0279	N/A	N/A	N/A	N/A	N/A	0.003	N/A	0.007	N/A
	1,1,1-Trichloroethane	0.00392	N/A	0.0101	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	1,1,2-Trichloroethane	0.00392	N/A	0.0101	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Trichloroethylene	0.00392	N/A	0.0101	N/A	N/A	N/A	N/A	N/A	0.001	N/A	0.003	N/A
	Vinyl Chloride	0.0194	N/A	0.0500	N/A	N/A	N/A	N/A	N/A	0.005	N/A	0.013	N/A
	Enterococci ¹	N/A		N/A		35		130		35		130	
	pH	6.0 SU (min)		9.0 SU (max)		N/A		N/A		6.0 SU (min)		9.0 SU (max)	
201	Flow	N/A		N/A		N/A		N/A		Report, MGD		Report, MGD	
	Chemical Oxygen Demand	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	200
	Oil and Grease	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15
301	Flow	N/A		N/A		N/A	N/A	N/A	N/A	0.030 MGD		0.030 MGD	
	Total Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.08	N/A	0.17	N/A
	Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	0.02	N/A
	1,2-Dibromoethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	0.14	N/A
	1,2-Dichloroethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	0.14	N/A

¹ Units of measure are colony forming units (CFU) or most probable number (MPN) per 100 mL.

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		Daily Avg		Daily Max		Daily Avg		Daily Max		Daily Avg		Daily Max	
		lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L
002, 003, 004, & 005	Flow	N/A		N/A		N/A	N/A	N/A	N/A	Report, MGD		Report, MGD	
	Chemical Oxygen Demand	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	200
	Oil and Grease	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15
	pH	6.0 SU (min)		9.0 SU (max)		N/A	N/A	N/A	N/A	6.0 SU (min)		9.0 SU (max)	



2322 COUNTY ROAD 229
FREEPORT, TX 77541

March 20, 2024

FEDEX

Executive Director
Applications Review and Processing Team (MC148)
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, Texas 78753

ChampionX Freeport
TPDES Wastewater Permit Renewal Application
TPDES Permit No. WQ0001806000

Dear Executive Director,

Enclosed is an application to renew the Texas Pollutant Discharge Elimination System (TPDES) Permit Number WQ0001806000, issued to ChampionX Freeport.

The primary purpose of this application is the renewal of the existing permit. Outfall 002 will continue to be active and used in extreme, rare storm conditions. Outfalls 003, 004, and 005 will remain in the permit and continue to be inactive. The TCEQ will be notified in writing if these outfalls are reactivated.

The permit renewal application is being submitted electronically alongside a mailed hard copy version. It consists of a table of contents, the Administrative Section, the Technical Report Section, the Worksheet Sections and Associated Attachments. A check for the required permit application fee of \$1,215 will be sent directly to the Financial Administration Division of the TCEQ. This fee is applicable to a minor facility subject to EPA categorical standards.

As a note, updated lab analysis for the renewal application was completed and included in the Attachments. The final analysis was received the second week of March and the application was completed thereafter.

Please contact Andy Slater at (979) 239-5880 if there are any questions concerning this application.

Sincerely,

Jijoy Gopalakrishnan
Plant Manager

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ChampionX Freeport

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Miscellaneous Attachments

Attachment 12 UV Light for Enterococci Information

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ INDUSTRIAL WASTEWATER PERMIT APPLICATION

INDUSTRIAL ADMINISTRATIVE REPORT

Complete and submit this checklist with the application.

APPLICANT: ChampionX Freeport

PERMIT NUMBER: WQ0001806000

Indicate if each of the following items is included in your application.

	Y	N		Y	N
Administrative Report 1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 8.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Administrative Report 1.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Worksheet 9.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SPIF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 10.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Core Data Form	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 11.0	<input type="checkbox"/>	<input type="checkbox"/>
Technical Report 1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 11.1	<input type="checkbox"/>	<input type="checkbox"/>
Worksheet 1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 11.2	<input type="checkbox"/>	<input type="checkbox"/>
Worksheet 2.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Worksheet 11.3	<input type="checkbox"/>	<input type="checkbox"/>
Worksheet 3.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Original USGS Map	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Worksheet 3.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Affected Landowners Map	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Worksheet 3.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Landowner Disk or Labels	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Worksheet 3.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Flow Diagram	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Worksheet 4.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site Drawing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Worksheet 4.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Original Photographs	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Worksheet 5.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Solids Management Program	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Worksheet 6.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water Balance	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Worksheet 7.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

For Commission Use Only:

Segment Number: _____ County: _____ Expiration Date: _____

Proposed/Current Permit Number: _____ Region: _____

INDUSTRIAL ADMINISTRATIVE REPORT 1.0

The following information **is required** for **all** applications—renewals, new, and amendments.

1. TYPE OF APPLICATION AND FEES (Instructions, Page 21)

Permit No.: WQ0001806000

EPA ID No.: TX0008761

- | | |
|--|--|
| <input type="checkbox"/> New TPDES permit | <input type="checkbox"/> New TLAP permit |
| <input type="checkbox"/> Major Amendment with Renewal | <input type="checkbox"/> Major Amendment without Renewal |
| <input checked="" type="checkbox"/> Renewal of existing permit | <input type="checkbox"/> Stormwater only discharge |
| <input type="checkbox"/> Minor Amendment to permit | <input type="checkbox"/> Minor modification to permit |

If applying for an **amendment** or modification of a permit, please describe the request in detail.

Please indicate by a check mark the amount submitted for the application fee:

EPA Classification	New	Major Amendment (With or Without Renewal)	Renewal Only	Minor Amendment/ Minor Modification
Minor facility not subject to EPA categorical effluent guidelines (<i>40 CFR Parts 400-471</i>)	<input type="checkbox"/> \$350	<input type="checkbox"/> \$350	<input type="checkbox"/> \$315	<input type="checkbox"/> \$150
Minor facility subject to EPA categorical effluent guidelines (<i>40 CFR Parts 400-471</i>)	<input type="checkbox"/> \$1,250	<input type="checkbox"/> \$1,250	<input checked="" type="checkbox"/> \$1,215	<input type="checkbox"/> \$150
Major facility	N/A *	<input type="checkbox"/> \$2,050	<input type="checkbox"/> \$2,015	<input type="checkbox"/> \$450

* All facilities are designated as minors until formally classified as a major by EPA.

Payment Information:Mailed Check or Money Order Number:

Check or Money Order Amount: \$1,215

Named Printed on Check or Money Order:

EPAY Voucher Number: 582EA000601735

Copy of Voucher Enclosed? ☒ Yes

Attachment: [Click here to enter text](#)

2. APPLICANT INFORMATION (Instructions, Pages 21-22)

a. Facility Owner

(Owner of the facility must apply for the permit.)

What is the Legal Name of the entity (applicant) applying for this permit?

ChampionX LLC

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may [search for your CN](http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch) on the TCEQ website at

<http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch>

CN: 602898751

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in 30 TAC § 305.44.

First/Last Name: Mr. Jijoy Gopalakrishnan

Title: Plant Manager

Credential: N/A

b. Co-applicant Information

What is the Legal Name of the co-applicant applying for this permit?

N/A

(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may [search for your CN](http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch) on the TCEQ website at

<http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch>:

CN: N/A

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in 30 TAC § 305.44.

First/Last Name: N/A

Title: N/A

Credential: N/A

Provide a brief description of the need for a co-permittee:

N/A

c. Core Data Form

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of Administrative Report 1.0.

Attachment: 1

3. APPLICATION CONTACT INFORMATION (Instructions, Page 22)

If the TCEQ needs additional information regarding this application, who should be contacted?

a. First/Last Name: Ms. Marcy Putnam Credential: N/A
Organization Name: ChampionX Freeport Title: SH&E Specialist II
Mailing Address: P.O. Box 2167
City: Freeport State: TX ZIP Code: 77541
Phone No.: 979-239-5858 Ext.: N/A Fax No.: N/A
E-mail Address: marcy.putnam@championx.com
Check one or both: ☐ Administrative Contact ☒ Technical Contact

b. First/Last Name: Mr. Andy Slater Credential: N/A
Organization Name: ChampionX Freeport Title: SH&E Superintendent
Mailing Address: P.O. Box 2167
City: Freeport State: TX ZIP Code: 77541
Phone No.: 979-239-5880 Ext.: Fax No.:
E-mail Address: abslater@ecolab.com
Check one or both: ☒ Administrative Contact ☐ Technical Contact

Attachment: N/A

4. PERMIT CONTACT INFORMATION (Instructions, Page 22)

Provide two names of individuals that can be contacted throughout the permit term.

a. First/Last Name: Ms. Marcy Putnam Credential: N/A
Organization Name: ChampionX Freeport Title: SH&E Specialist II
Mailing Address: P.O. Box 2167
City: Freeport State: TX ZIP Code: 77541
Phone No.: 979-239-5858 Ext.: N/A Fax No.: N/A
E-mail Address: marcy.putnam@championx.com

b. First/Last Name: Mr. Andy Slater Credential: N/A
Organization Name: ChampionX Freeport Title: SH&E Superintendent
Mailing Address: P.O. Box 2167
City: Freeport State: TX ZIP Code: 77451
Phone No.: 979-239-5880 Ext.: Fax No.:
E-mail Address: ablslater@ecolab.com

Attachment: N/A

5. BILLING CONTACT INFORMATION(Instructions, Page 22)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to permits in effect on September 1 of each year. The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (using form TCEQ-20029).

First/Last Name: Mr. Andy Slater

Credential: N/A

Organization Name: ChampionX Freeport

Title: SH&E Superintendent

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone No.: 979-239-5880

Ext.: N/A

Fax No.: N/A

E-mail Address: abslater@ecolab.com

6. DMR/MER CONTACT INFORMATION (Instructions, Pages 22-23)

Provide the name and complete mailing address of the person delegated to receive and submit Discharge Monitoring Reports (EPA 3320-1) or Monthly Effluent Reports.

First/Last Name: Ms. Marcy Putnam

Credential: N/A

Organization Name: ChampionX Freeport

Title: SH&E Specialist II

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone No.: 979-239-5858

Ext.: N/A

Fax No.: N/A

E-mail Address: marcy.putnam@championx.com

You can [submit DMR data](https://www.tceq.texas.gov/field/netdmr/netdmr.html) on the TCEQ website at <https://www.tceq.texas.gov/field/netdmr/netdmr.html>. Establish an electronic reporting account with the permit number.

7. NOTICE INFORMATION (Instructions, Pages 23-24)

a. Individual Publishing the Notices

First/Last Name: Mr. Andy Slater

Credential: N/A

Organization Name: ChampionX Freeport

Title: SH&E Superintendent

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone No.: 979-239-5880

Ext.: N/A

Fax No.: N/A

E-mail Address: abslater@ecolab.com

b. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☐ E-mail Address:

☐ Fax No.:

☒ Regular Mail:

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone No.: 979-239-5880

Ext.: N/A

Fax: N/A

c. Contact in the Notice

First/Last Name: Mr. Andy Slater

Credential: N/A

Organization Name: ChampionX Freeport

Title: SH&E Superintendent

Phone No.: 979-239-5880

Ext.: N/A E-mail: abslater@ecolab.com

d. Public Place Information

If the facility or outfall is located in more than one county, a public viewing place for each county must be provided.

Public building name: Brazoria County Library – Freeport Branch

Location within the building: N/A

Physical Address of Building: 410 Brazosport Blvd.

City: Freeport

County: Brazoria

Contact Name: [REDACTED]

Phone No.: 979-233-3622

Ext.: N/A

e. Bilingual Notice Requirements:

This information **is required** for **new, major amendment, and renewal applications**. It is not required for minor amendment or minor modification applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are required.

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

☒ Yes ☐ No

If **no**, publication of an alternative language notice is not required; **skip to** Item 8 (REGULATED ENTITY AND PERMITTED SITE INFORMATION.)

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?
- ☒ Yes ☐ No
3. Do the students at these schools attend a bilingual education program at another location?
- ☐ Yes ☒ No
4. Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC §89.1205(g)?
- ☐ Yes ☒ No
5. If the answer is yes to question 1, 2, 3, or 4, public notices in an alternative language are required. Which language is required by the bilingual program? Spanish

8. REGULATED ENTITY AND PERMITTED SITE INFORMATION (Instructions Pages 24-26)

If the site of your business is part of a larger business site, a Regulated Entity Number (RN) may already be assigned for the larger site. Use the RN assigned for the larger site. [Search the TCEQ's Central Registry](http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch) at <http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch> to determine the RN or to see if the larger site may already be registered as a regulated site:

If the site is found, provide the assigned Regulated Entity Number and provide the information for the site to be authorized through this application below. The site information for this authorization may vary from the larger site information.

TCEQ issued Regulated Entity Number (RN): **RN** 102185717

a. State/TPDES Permit No.: WQ0001806000

Expiration Date: 07/01/2024

EPA Identification No. (TPDES Permits only): TX 0008761

b. Name of project or site (the name known by the community where located): ChampionX Freeport

c. Is the location address of the facility in the existing permit the same?

☒ Yes ☐ No

d. If the facility is located in Bexar, Comal, Hays, Kinney, Medina, Travis, Uvalde, or Williamson County, additional information concerning protection of the Edwards Aquifer may be required.

e. Owner of treatment facility: ChampionX Freeport

Ownership of Facility: ☐ Public ☒ Private ☐ Both ☐ Federal

f. Owner of land where treatment facility is or will be:

First/Last Name: ChampionX Freeport

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone No.: 979-238-5880

E-mail Address: abslater@ecolab.com

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years. In some cases, a lease may not suffice - see instructions.

Attachment: N/A

g. Owner of effluent disposal site:

First/Last Name: N/A

Mailing Address:

City: State: ZIP Code:

Phone No.: E-mail Address:

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years.

Attachment: N/A

h. Owner of sewage sludge disposal site:

First/Last Name: N/A

Mailing Address:

City: State: ZIP Code:

Phone No.: E-mail Address:

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years.

Attachment:

(This information is required only if authorization is sought in the permit for sludge disposal on property owned or controlled by the applicant.)

9. DISCHARGE/ DISPOSAL INFORMATION (Instructions, Pages 26-28)

a. Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

b. Provide an **original** full size USGS Topographic Map with all required information. Indicate by a check mark that the following information is provided.

- | | |
|--|--|
| <input checked="" type="checkbox"/> Applicant's property boundary | <input type="checkbox"/> Effluent disposal site boundaries |
| <input checked="" type="checkbox"/> Treatment facility boundaries | <input type="checkbox"/> New and future construction |
| <input checked="" type="checkbox"/> Labeled point(s) of discharge and highlighted discharge route(s) | <input checked="" type="checkbox"/> One-mile radius and three-miles downstream information |
| <input type="checkbox"/> Sewage sludge disposal site | <input checked="" type="checkbox"/> All ponds |

c. Is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No Note: ChampionX is awaiting a sludge press so they can dispose of filter cake to the local landfill.

If **no**, or a new permit application, please give an accurate description:

N/A

d. Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☒ Yes ☐ No

If **no**, or a new or amendment permit application, provide an accurate description:

e. City nearest the outfall(s): Freeport

f. County in which the outfalls(s) is/are located: Brazoria

g. Outfall Latitude: See Attachment # 3

Longitude:

h. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☐ Yes ☒ No

If **yes**, indicate by a check mark if:

☐ Authorization granted ☐ Authorization pending

For **new and amendment** applications, provide copies of letters that show proof of contact and the approval letter upon receipt.

Attachment: N/A

i. For all applications involving an average daily discharge of 5 MGD or more, provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge.

N/A

j. For TLAPs, is the location of the effluent disposal site in the existing permit accurate?

☐ Yes ☐ No

If **no**, or a new or amendment permit application, provide an accurate description:

N/A

k. City nearest the disposal site: N/A

l. County in which the disposal site is located: N/A

m. Disposal Site Latitude: Longitude: N/A

- n. For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

N/A

- o. For **TLAPs**, please identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained:

N/A

10. MISCELLANEOUS INFORMATION (Instructions, Pages 28-29)

- a. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐

Yes

☒

No

List each person formerly employed by the TCEQ who represented your company and was paid for service regarding the application:

- b. Do you owe any fees to the TCEQ?

☐

Yes

☒

No

If **yes**, provide the following information:

Account number:

Amount past due:

- c. Do you owe any penalties to the TCEQ?

☐

Yes

☒

No

If **yes**, please provide the following information:

Enforcement order number:

Amount past due:

11. SIGNATURE PAGE (Instructions, Page29)

Permit Number: WQ00001806000

Applicant: ChampionX Freeport

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Jijoy Gopalakrishnan

Signatory title: Plant Manager

Signature: _____

(Use blue ink)

Date: 03/18/2024

Subscribed and Sworn to before me by the said JIJAY GOPALAKRISHNAN

on this 18 day of March, 2024.

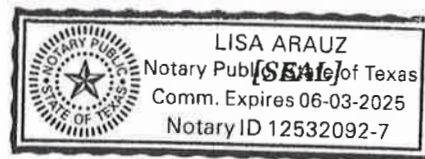
My commission expires on the 06 day of 03, 2025.

Lisa Arauz

Notary Public

Brazoria

County, Texas



If co-applicants are necessary, each entity must submit an original, separate signature page.

INDUSTRIAL ADMINISTRATIVE REPORT 1.1 Note: Not Applicable

The following information is required for new and amendment applications.

1. AFFECTED LANDOWNER INFORMATION (Instructions, Pages 30-32)

- a. Indicate by a check mark that the landowners map or drawing, with scale, includes the following information, as applicable.
- ☐ The applicant's property boundaries
 - ☐ The facility site boundaries within the applicant's property boundaries
 - ☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone
 - ☐ The property boundaries of all landowners surrounding the applicant's property (Note: if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)
 - ☐ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream
 - ☐ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge
 - ☐ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides
 - ☐ The boundaries of the effluent disposal site (for example, irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property
 - ☐ The property boundaries of all landowners surrounding the applicant's property boundaries where the effluent disposal site is located
 - ☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners surrounding the applicant's property boundaries where the sewage sludge land application site is located
 - ☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (for example, sludge surface disposal site or sludge monofill) is located
- b. Indicate by a check mark in which format the landowners list is submitted:
- ☐ Readable/Writeable CD
 - ☐ Four sets of labels
- c. ☐ Indicate by a check mark that a separate list with the landowners' names and mailing addresses cross-referenced to the landowners map has been provided.
- d. Provide the source of the landowners' names and mailing addresses:
- e. As required by *Texas Water Code § 5.115*, is any permanent school fund land affected by this application?
- ☐ Yes
 - ☐ No

- f. If **yes**, provide the location and foreseeable impacts and effects this application has on the land(s):

--

2. ORIGINAL PHOTOGRAPHS (Instructions, Page 32)

Provide original ground level photographs. Indicate with checkmarks that the following information is provided.

- ☐ At least one original photograph of the new or expanded treatment unit location
- ☐ At least two photographs of the existing/proposed point of discharge and as much area downstream (photo 1) and upstream (photo 2) as can be captured. If the discharge is to an open water body (e.g., lake, bay), the point of discharge should be in the right or left edge of each photograph showing the open water and with as much area on each respective side of the discharge as can be captured.
- ☐ At least one photograph of the existing/proposed effluent disposal site
- ☐ A plot plan or map showing the location and direction of each photograph

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING INDUSTRIAL TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: ____Renewal ____Major Amendment ____Minor Amendment ____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

____ Texas Historical Commission

____ U.S. Fish and Wildlife

____ Texas Parks and Wildlife Department

____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 33)

The SPIF must be completed as a separate document. The TCEQ will mail a copy of the SPIF to each agency as required by the TCEQ agreement with EPA. If any of the items are not completely addressed or further information is needed, you will be contacted to provide the information before the permit is issued. Each item must be completely addressed.

Do not refer to a response of any item in the permit application form. Each attachment must be provided with this form separately from the administrative report of the application. The application will not be declared administratively complete without this form being completed in its entirety including all attachments.

The following applies to all applications:

1. Permittee: ChampionX Freeport

2. Permit No. WQ00 01806000

EPA ID No. TX 0008761

3. Address of the project (location description that includes street/highway, city/vicinity, and county):
2322 County Road 229, Freeport. TX 77541

4. Provide the name, address, phone and fax number of an individual that can be contacted to answer specific questions about the property.

First/Last Name: Mr. Andy Slater

Credential: N/A

Organization Name: ChampionX Freeport

Title: SH&E Superintendent

Mailing Address: P.O Box 2167

City: Freeport

State: TX

ZIP Code: 77541

Phone: 979-239-5880

Fax: 979-233-6767

E-mail Address: abslater@ecolab.com

5. List the county in which the facility is located: Brazoria
6. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

N/A

7. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in *30 TAC Chapter 307*). If known, please identify the classified segment number.

See SPIF Attachment

8. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report).
9. Provide original photographs of any structures 50 years or older on the property.
10. Does your project involve any of the following? Check all that apply.

- ☐ Proposed access roads, utility lines, construction easements
- ☐ Visual effects that could damage or detract from a historic property's integrity
- ☐ Vibration effects during construction or as a result of project design
- ☐ Additional phases of development that are planned for the future
- ☐ Sealing caves, fractures, sinkholes, other karst features
- ☐ Disturbance of vegetation or wetlands

11. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

See SPIF Attachment

12. Describe existing disturbances, vegetation, and land use:

See SPIF Attachment

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

13. List construction dates of all buildings and structures on the property:

N/A

14. Provide a brief history of the property, and name of the architect/builder, if known.

N/A

WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- Do not mail this form with the application form.
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, Texas 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, Texas 78753

Fee Code: WQP Waste Permit No: WQ0001806000

1. Check or Money Order Number:
2. Check or Money Order Amount: \$1,215
3. Date of Check or Money Order:
4. Name on Check or Money Order:

5. APPLICATION INFORMATION

Name of Project or Site: ChampionX Freeport

Physical Address of Project or Site: 2322 CR 229 Freeport, TX 77541

If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space

[See Attachment 14 for ePay Voucher Information](#)

ATTACHMENT 1

INDIVIDUAL INFORMATION Note: Not Applicable

1. Individual information (Instructions, Page 34)

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss):

Full legal name (first, middle, last):

Driver's License or State Identification Number:

Date of Birth:

Mailing Address:

City, State, and Zip Code:

Phone Number:

Fax Number:

E-mail Address:

CN:

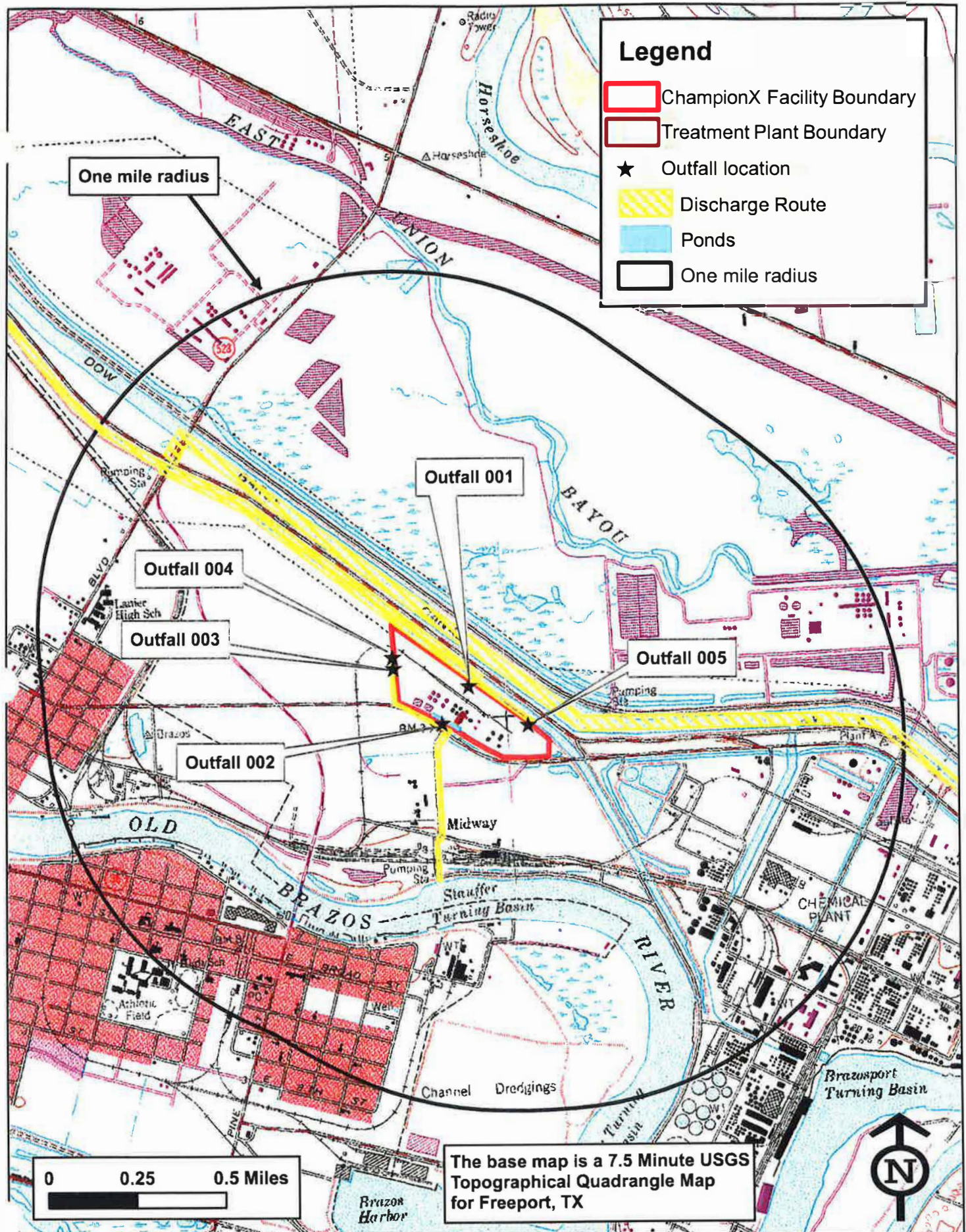
For Commission Use Only:

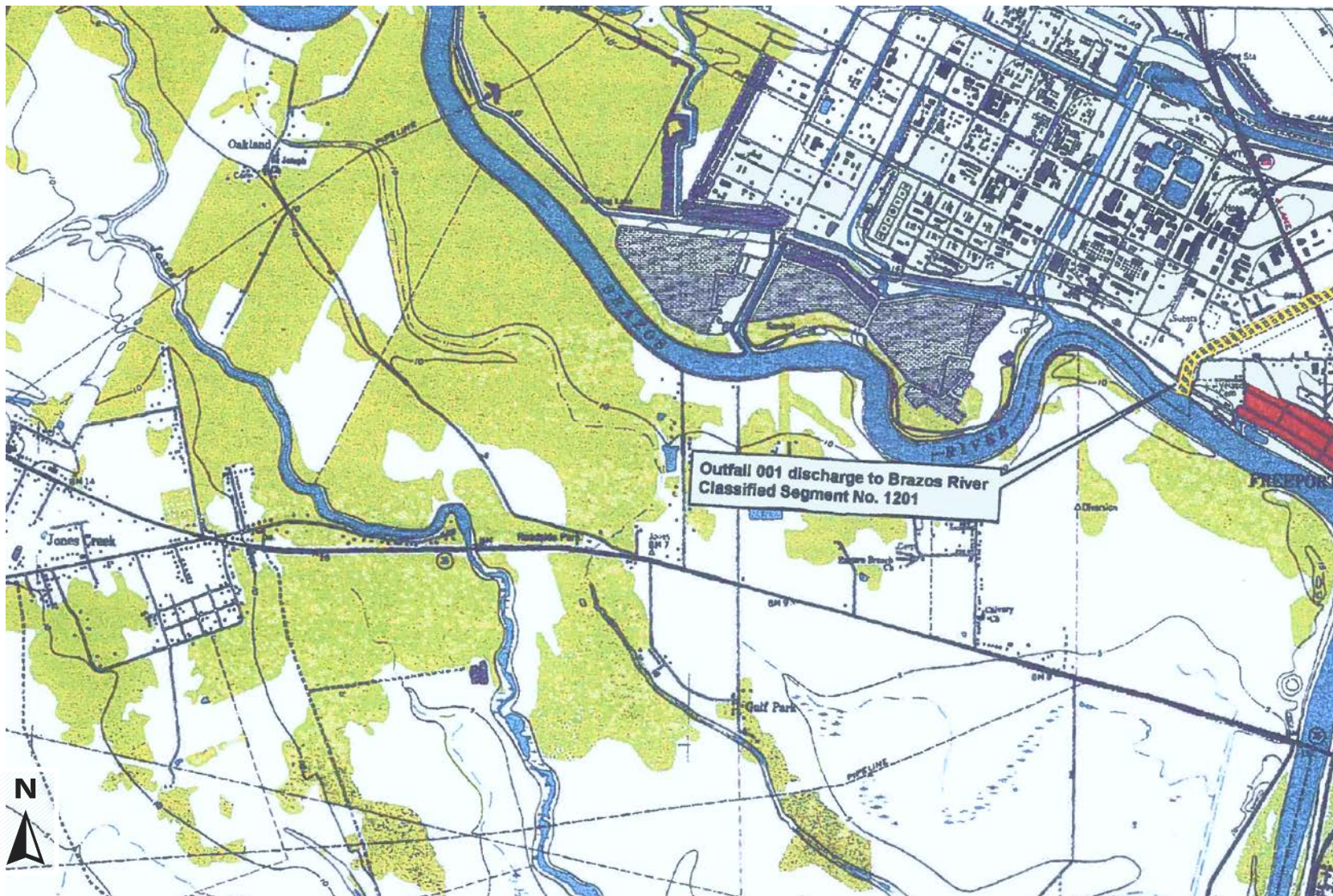
Customer Number:

Regulated Entity Number:

Permit Number:

**SPIF
ATTACHMENT**





LEGEND



Discharge Route

CHAMPIONX

ChampionX Freeport

TPDES Permit No. WQ0001806000

Scale: 1:24000

Attachment SPIF Map

Jones Creek Quadrangle
7.5 Minute USGS
Topographical Map

TECHNICAL REPORT 1.0

INDUSTRIAL

This application form is for an industrial wastewater discharge authorization only. Your facility may need additional authorizations from the TCEQ Waste Permitting Division or the TCEQ Air Permitting Division.

The following information is required for **all TPDES** and **TLAP** renewal, new, and amendment applications.

1. FACILITY/SITE INFORMATION (Instructions, Pages 35-36)

- a. Describe the type of activity and general nature of your business.

The facility uses both Oxyalkylation and Conventional Reaction/Blend processes to produce a wide variety of materials used in oil field applications. The production facility started construction in 1988 and operation in 1990. Full production started in 1991. The production for 2023 was 134.6 million pounds.

- b. Describe the wastewater-generating processes.

The process wastewater generated at the facility is treated in an on-site activated carbon biological treatment unit. A wastewater flow schematic is included as Attachment 6. The wastewater is collected in lined, concrete process sumps equipped with stainless steel inner tanks. Sources of process wastewater include process condensate, process equipment/area wash water, flare seal water, water contained in raw materials, laboratory wastewater, and potentially contaminated storm water that is collected within the plant's curbed storage and process areas. Domestic treatment 101 and 202 co-mingle to discharge from Outfall 001. Formeldahyde and oxy condensate are sent off-site for disposal. Since operations are conducted in batch mode, the generation of wastewater is not continuous. The wastewater is pumped to Tank 211 (TK-211) which is a 158,000 gallon wastewater equalization holding tank. This tank is used to equalize the flow to the wastewater treatment unit.

- c. Provide a list of raw materials, major intermediates, and products handled at your facility.

Materials List

Raw Materials	Intermediate Products	Final Products
See Attachment #4		

d. Attach a facility map (drawn to scale) with the following information:

- Production areas, maintenance areas, materials-handling areas, and waste-disposal areas
- The location of each unit of the wastewater treatment plant including the location of wastewater collection sumps, impoundments, and outfalls (also include locations of sampling points if significantly different from outfall locations)

Attachment: #5

e. Is this a new permit application for an existing facility?

☐ Yes ☒ No

If **yes**, provide background discussion below.

f. Is the treatment facility/disposal site located above the 100-year frequency flood level?

☒ Yes ☐ No

List source(s) used to determine 100-year frequency flood plain:

FEMA Flood Insurance Rate Map #48039C0780I, dated November 17, 1993

If **no**, provide the elevation of the 100-year frequency flood plain and describe what protective measures are in use or planned to be used to prevent flooding of the treatment facility/disposal area.

g. For new or amendment permit applications, will any construction operations result in a discharge of fill material into a water in the state?

☐ Yes ☐ No

If **no**, proceed to Item 2.

h. If **yes** to the above question, has the applicant applied for a U.S. Army Corps of Engineers 404 Dredge and Fill permit?

☐ Yes ☐ No

If **yes**, provide the permit number:

If **no**, provide the approximate date you anticipate submitting your application to the Corps:

2. TREATMENT SYSTEM (Instructions, Page 36)

- a. List any physical, chemical, or biological treatment process that you use for the treatment of wastewater at your facility. Include a description of each treatment process, starting with initial treatment and finishing with the outfall/point of disposal.

The PACT Model 55 package treatment system used at Champion X, Freeport, Texas, is a factory fabricated continuous flow system consisting of biological oxidation, carbon adsorption, clarification, and sludge storage sized to treat 7 gpm of industrial wastewater. Wastewater is pumped to the PACT aeration tank where virgin powdered carbon and nutrients are added. In the aeration tank, the wastewater is aerated in the presence of up to 15,000 mg/l biomass, powdered activated carbon and inert material. The mixed liquor from the aeration tank flows to a circular clarifier where the solids are allowed to settle. Liquid cationic polymer is added to the clarifier influent to aid in solids settling. Clarifier underflow solids are recycled back to the aeration tank on a continuous basis to maintain the required mixed liquor solids concentration. The spent carbon and excess biomass produced are removed from the systems by pumping a portion of the clarifier underflow recycle stream to the aerated sludge storage tank. The aerated sludge storage tank is sized to hold approximately 10 days of sludge production and offers the capability of thickening the sludge by gravity settling and decanting supernatant. A froth spray system consisting of a submersible pump mounted on the clarifier and stainless steel nozzles which are mounted along one side of the aeration tank provide control of any foaming that may occur. A new UVHydro-Optic light system was put in for Enterococci disinfection in November 2023. Details are in Attachment 12 and water process mapping. The treated wastewater is discharged via Internal Outfall 101 and then through Final Outfall 001.

- b. Attach a flow schematic with a water balance showing each treatment unit and all sources of water and wastewater flow into the treatment plant and to each outfall/point of disposal.

Attachment: #6

3. IMPOUNDMENTS (Instructions, Pages 36-39)

Do you use or plan to use any wastewater lagoons, ponds, or impoundments?

☐ Yes ☒ No

If **yes**, complete **Item 3.a** for **existing** impoundments and **Items 3.a-3.h** for **new or proposed** impoundments. If **no**, proceed to Item 4.

Please note: Surface impoundments may also require additional authorizations from the TCEQ Waste Permit Division.

- a. Provide the following information in the table provided:

Use Designation: Indicate the appropriate use designation for each pond: Treatment (**T**), Disposal (**D**), Containment (**C**), or Evaporation (**E**).

Associated Outfall Number: If a discharge occurs from the impoundments, designate the outfall associated with the impoundment.

Liner Type: If the impoundments are lined to comply with specifications outlined for 1) a compacted clay liner (C), 2) an in-situ clay liner (I), or 3) a synthetic/plastic/rubber liner (S), indicate the liner type with the appropriate letter designation (**see instructions for further detail on liner specifications**). If not, provide a reference to the attachment that provides a description of the alternate liner and any additional technical information necessary for an evaluation.

Dimensions: Provide the dimensions, freeboard, surface area, and storage capacity of the impoundments. For impoundments with irregular shapes, submit surface area (instead of length and width), the average depth, and the maximum depth below natural ground level.

Impoundment Information

Parameter	Pond #	Pond #	Pond #	Pond #
Use Designation: (T) (D) (C) or (E)				
Associated Outfall Number				
Liner Type (C) (I) or (S)				
Alt. Liner Attachment Reference				
Length (ft)				
Width (ft)				
Depth from Water Surface (ft)				
Avg Depth from Nat. Ground Level (ft)				
Max Depth from Nat. Ground Level (ft)				
Freeboard (ft)				
Surface Area (acres)				
Storage Capacity (gallons)				
Compliance with 40 CFR Chapter 257, Subpart D is required.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Impoundment Information

Parameter	Pond #	Pond #	Pond #	Pond #
Use Designation: (T) (D) (C) or (E)				
Associated Outfall Number				
Liner Type (C) (I) or (S)				
Alt. Liner Attachment Reference				
Length (ft)				
Width (ft)				
Depth from Water Surface (ft)				
Avg Depth from Nat. Ground Level (ft)				
Max Depth from Nat. Ground Level (ft)				
Freeboard (ft)				
Surface Area (acres)				
Storage Capacity (gallons)				
Compliance with 40 CFR Chapter 257, Subpart D is required.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

The following information (b - h) is required only for **new or proposed** impoundments.

b. Indicate if any of the following data was provided with the application:

- ☐ Compacted clay liner data
- ☐ Synthetic/plastic/rubber liner data
- ☐ In-situ clay liner data

Attachment: [link here to attach file](#)

c. Are there any leak detection systems or groundwater monitoring wells in place or planned?

- ☐ Yes
- ☐ No

If **yes**, attach information on the leak detection system for each pond and groundwater monitoring well data.

Attachment: [link here to attach file](#)

d. Is the bottom of the pond above the seasonal high water table in the shallowest waste-bearing zone?

- ☐ Yes
- ☐ No

If **no**, attach additional information describing the depth of the seasonal high water table in the shallowest waste-bearing zone in relation to the depth of the bottom of the new or proposed impoundment and how this may or may not impact groundwater.

Attachment: [link here to attach file](#)

e. Attach a USGS quadrangle map or a color copy of original quality and scale which accurately locates and identifies water supply wells and monitor wells within ½ mile radius of the impoundments

Attachment: [link here to attach file](#)

f. Attach copies of State Water Well Reports (driller's logs, completion data), and data on depths to groundwater for water supply wells including a description of how the depths to groundwater were obtained

Attachment: [link here to attach file](#)

g. For TLAP permit applications: Are new or proposed impoundment(s) and the land application disposal area are located in the same general area?

- ☐ Yes
- ☐ No

If **yes**, provide information for this item in Worksheet 3.0 (Item 5).

h. Attach information pertaining to the groundwater, soils, geology, etc. used to assess the potential for migration of wastes from the impoundments or the potential for contamination of groundwater or surface water.

Attachment: [link here to attach file](#)

4. OUTFALL/DISPOSAL METHOD INFORMATION (Instructions, Pages 39-40)

Complete the following tables to describe the location and wastewater discharge or disposal operations for each outfall for discharge operations and for each point of disposal for TLAP operations.

For TLAP permit applications: Indicate the disposal method and each individual irrigation area (I), evaporation pond (E), or subsurface drainage system (S) by providing the appropriate letter designation for the disposal method followed by a numerical designation for each disposal area in the space provided for "Outfall" designation (e.g. "E1" for evaporation pond 1, "I2" for irrigation area No. 2, etc.).

Outfall Latitude and Longitude

Outfall Number	Latitude-degrees	Latitude-minutes	Latitude-seconds	Longitude-degrees	Longitude-minutes	Longitude-seconds
001	28	57	35.26	95	20	9.48
002	28	57	30.46	95	20	12.9
101	28	57	35.26	95	20	9.48
201	28	57	34.4	95	20	9.76
301	28	57	34.54	95	20	9.95
003	28	57	38.27	95	20	19.32
004	28	57	37.21	95	20	19.29
005	28	57	27.99	95	19	59.31

Outfall Location Description

Outfall Number	Location Description
001	External Outfall located at the northern boundary of plant near Tank 722.
002	External Outfall located at the southern boundary of plant near Sump No. 5.
101	Internal Outfall located at the northern boundary of plant near Tank 722.
201	Internal Outfall located at the northern boundary of plant near Tank 722.
301	Internal Outfall located at northern boundary of plant near Tank 722.
003	External Outfall located at the western boundary of plant.
004	External Outfall located at the western boundary of plant.
005	External Outfall located at the northeast corner of plant near flare.

Description of Sampling Points (if different from Outfall location)

Outfall Number	Description of Sampling Point
001	Spigot northeast of TK-722.
002	None
003	None (stormwater—inactive)
004	None (stormwater—inactive)
005	None (stormwater - inactive)
101	Spigot immediately north of Wastewater Treatment Plant and east of Tk-211 and west of 201 spigot.
201	Spigot northeast of TK-722.

Outfall Number	Description of Sampling Point
301	Outfall is inactive (recovered groundwater)

Outfall Flow Information – Permitted and Proposed

Outfall Number	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)
001	Report	Report	Report	Report
002	Variable	Variable	Variable	Variable
101	.0236	.050	.0236	.050
201	Variable	Variable	Variable	Variable
301	0.030	0.030	Variable	Variable
003	Variable	Variable	Variable	Variable
004	Variable	Variable	Variable	Variable
005	Variable	Variable	Variable	Variable

Outfall Discharge – Method and Measurement

Outfall Number	Pumped Discharge? Y/N	Gravity Discharge? Y/N	Type of Flow Measurement Device Used
001	Y	N	Orifice Plate
002	Y	N	Estimated
101	Y	N	Orifice Plate
201	Y	N	Estimated
301	Y	N	Orifice Plate
003	Y	N	Estimated
004	Y	N	Estimated
005	Y	N	Estimated

Outfall Discharge – Flow Characteristics

Outfall Number	Intermittent Discharge? Y/N	Seasonal Discharge? Y/N	Continuous Discharge? Y/N	Discharge Duration (hours/day)	Discharge Duration (days/month)	Discharge Duration (months/year)
001	Y	N	N	24	30.5	12
002	Y	N	N	Variable	Variable	Variable
101	Y	N	N	24	30.5	12
201	Y	N	N	Variable	Variable	Variable
301	Y	N	N	Variable	Variable	Variable
003	Y	N	N	Variable	Variable	Variable
004	Y	N	N	Variable	Variable	Variable
005	Y	N	N	Variable	Variable	Variable

Wastestream Contributions

Outfall No.: 001

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Treated Process Area Wastewater	.018	18
Treated Potentially Contaminated Stormwater	.002	2
Treated Laboratory Process Wastewater	.0014	1
Treated Water in Raw Materials	.00095	1
Treated Sanitary Wastewater	.001	1
Non-Contaminated Stormwater including Cooling Tower Blowdown and Non-Contact Steam Condensate	.075	76

Outfall No.: 002

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Stormwater	Variable	100%

Outfall No.: 101

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Treated Process Area Wastewater	.018	77
Treated Potentially Contaminated Stormwater	.002	9
Treated Laboratory Process Wastewater	.00144	6
Treated Water in Raw Materials	.00095	4
Treated Sanitary Wastewater	.001	4

Additional Outfall wastestream contributions included as **Attachment: # 7**

5. BLOWDOWN AND ONCE-THROUGH COOLING WATER DISCHARGES (Instructions, Pages 40-41)

a. Does your facility use any cooling towers or boilers that discharge blowdown or other wastestreams to the outfall(s)?

☒ Yes ☐ No

b. Does your facility discharge once-through cooling water to the outfall(s)?

☒ Yes ☐ No

c. If **yes** to either Item a **or** b, attach the appropriate SDS with the following information for each chemical additive.

- Manufacturers Product Identification Number
- Product use (e.g., biocide, fungicide, corrosion inhibitor, etc.)
- Chemical composition including CASRN for each ingredient
- Classify product as non-persistent, persistent, or bioaccumulative
- Product or active ingredient half-life
- Frequency of product use (e.g., 2 hours/day once every two weeks)
- Product toxicity data specific to fish and aquatic invertebrate organisms
- Concentration of whole product in wastestream (if above item is for whole product)
- Concentration of active ingredient in wastestream (if above item is for active ingredient)

Please provide a summary attachment of this information in addition to the submittal of the SDS for each specific wastestream and the associated chemical additives and specify which outfalls are affected.

Attachment: # 8

d. Cooling Towers and Boilers

Cooling Towers and Boilers

Type of Unit	Number of Units	Dly Avg Blowdown (gallons/day)	Dly Max Blowdown (gallons/day)
Cooling Towers	1	8.460	28.800
Boilers	N/A	N/A	N/A

6. STORMWATER MANAGEMENT (Instructions, Page 41)

Are there any existing or proposed outfalls which discharge stormwater runoff commingled with other wastestreams?

☒ Yes ☐ No

If **no**, proceed to Item 7.

If **yes**, briefly describe the industrial processes and activities that occur outdoors or in some manner that may result in exposure of the materials to precipitation or runoff in areas where runoff is generated.

See Attachment #9

7. DOMESTIC SEWAGE, SEWAGE SLUDGE, AND SEPTAGE MANAGEMENT AND DISPOSAL (Instructions, Pages 41-42)

a. Please check the appropriate method(s) of domestic sewage and domestic sewage sludge treatment/disposal and complete Worksheet 5.0 or Item 7.b if directed to do so.

- ☐ Facility is connected to a wastewater treatment plant permitted to receive domestic sewage, or the domestic sewage is transported off-site to a permitted facility for treatment, disposal, or both. COMPLETE ITEM 7.b BELOW.
- ☐ Domestic sewage is disposed of by an on-site septic tank and drainfield system. COMPLETE ITEM 7.b BELOW.
- ☒ Both domestic and industrial treatment sludge ARE commingled prior to use or disposal.
- ☐ Industrial wastewater and domestic sewage are treated separately, and the respective sludge IS NOT commingled prior to sludge use or disposal. COMPLETE WORKSHEET 5.0 OF THIS APPLICATION.
- ☐ Facility is a POTW. COMPLETE WORKSHEET 5.0 OF THIS APPLICATION.
- ☐ Domestic sewage is not generated on-site.
- ☐ Other (e.g., portable toilets): Please provide a detailed description:

b. Provide the name and TCEQ, NPDES, or TPDES Permit No. of the waste-disposal facility which receives the domestic sewage/septage. If hauled by motorized vehicle, provide the name and TCEQ Registration No. of the hauler.

Domestic Sewage Plant/Hauler Name

Plant/Hauler Name	Permit/Registration No.
N/A	

8. IMPROVEMENTS OR COMPLIANCE/ENFORCEMENT REQUIREMENTS (Instructions, Page 42)

Is the permittee currently required to meet any implementation schedule for compliance or enforcement?

☐ Yes ☒ No

If **yes**, provide a brief summary of the requirements and a status update.

9. TOXICITY TESTING (Instructions, Pages 42-43)

Have any biological tests for acute or chronic toxicity been made on any of your discharges or on a receiving water in relation to your discharge within the last three years?

☐ Yes ☒ No

If **yes**, identify the tests and describe their purposes below. Please attach a copy of all tests performed that have not been previously sent to the TCEQ or the EPA.

Attachment: N/A

10. OFF-SITE/THIRD PARTY WASTES (Instructions, Page 43)

Do you receive wastes from off-site sources for any or all of the following: treatment in your facility, disposal on-site via land application, or discharge via a permitted outfall?

☐ Yes ☒ No

If **no**, proceed to Item 11.

If **yes**, provide responses to Items a, b, and c below.

a. Attach the following information to the application:

- List of wastes received
- Characterization of wastes received
- Volumes of each waste received
- Information on compatibility with on-site wastes
- Identified sources of wastes received
- Name and addresses of generators
- Description of the relationship of waste source(s) with your facility's activities

Attachment: N/A

b. Is wastewater from a TCEQ, NPDES, or TPDES permitted facility commingled with your wastewater after your final treatment and prior to discharge via your final outfall/point of disposal?

☐ Yes ☐ No

If **yes**, provide the name, address, and TCEQ, NPDES, or TPDES permit number of the contributing facility and a copy of any agreements or contracts relating to this activity.

Attachment: N/A

c. Is your facility a Publicly Owned Treatment Works (POTW) that accepts process wastewater from any Significant Industrial User (SIU) and has or is required to have an approved pretreatment program under the NPDES/TPDES program?

☐ Yes ☐ No

If **yes**, complete **Worksheet 6.0** of this application.

11. RADIOACTIVE MATERIALS (Instructions, Page 44)

a. Are radioactive materials mined, used, stored, or processed at this facility?

☐

Yes

☒

No

If **yes**, use the following table to provide the results of one analysis of your effluent for all radioactive materials that may be present. Provide results in picocuries per liter (pCi/L).

Radioactive Materials Mined, Used, Stored, or Processed

Radioactive Material	Concentration (pCi/L)

b. Do you have any knowledge or reason to believe that radioactive materials may be present in the discharge, including naturally occurring radioactive materials in the source waters or on the facility property?

☐

Yes

☒

No

If **yes**, use the following table to provide the results of one analysis of your effluent for all radioactive materials that may be present. Provide results in picocuries per liter (pCi/L). Do not include information provided in response to Item 11.a.

Radioactive Materials Present in the Discharge

Radioactive Material	Concentration (pCi/L)

12. COOLING WATER INTAKE STRUCTURES (Instructions, Pages 44-46)

a. The facility uses or proposes to use water for cooling purposes?

☒ Yes ☐ No

If **yes**, complete this item (12. Cooling Water Intake Structures); otherwise, stop here.

b. Cooling Water Supplier

1. Complete the following table with information regarding the Cooling Water Intake Structure(s) owner(s), operator(s), and location

Cooling Water Intake Structure(s) Owner(s), Operator(s), and Location

CWIS ID				
Owner	Dow Chemical Plant, Freeport, TX 77541			
Operator				
Latitude				
Longitude				

2. Cooling water is obtained from a Public Water Supplier (PWS)

☐ Yes ☒ No

If **yes**, provide the Public Water Supplier Registration No. for the entity providing cooling water in the space provided, and stop here.

- PWS Registration Number:

3. Cooling water is obtained from an Independent Supplier

☒ Yes ☐ No

If **no**, proceed to section c; otherwise, if **yes** provide the following:

- Independent Supplier's TPDES permit number:

If the Independent Supplier holds a TPDES Industrial Wastewater Permit, provide the permit number in the space provided. Otherwise enter N/A and continue.

- Independent Supplier's CWIS AIF (in MGD):

Enter the Independent Supplier's CWIS actual intake flow (AIF) in million gallons per day in the space provided, and continue.

- The facility uses or proposes to use less than 25% of the Independent Supplier's CWIS AIF for cooling purposes?

☒ Yes ☐ No

If **yes**, stop here. If **no**, proceed to section c.

c. 316(b) General Criteria

Compete all questions in this section unless otherwise directed.

1. The CWIS(s) have or will have a design intake flow of 2 MGD or greater

☐ Yes ☐ No

2. At least 25% of the total water withdrawn by the CWIS is used or will be used exclusively for cooling purposes on an annual average basis

☐ Yes ☐ No

3. The facility withdraws or proposes to withdraw water for cooling purposes from surface waters that meet the definition of Waters of the United States in *40 CFR § 122.2*

☐ Yes ☐ No

If **no**, provide an explanation of how the waterbody does not meet the definition of Waters of the United States in *40 CFR § 122.2* in the space provided. If additional space is needed for the explanation, include the information as an attachment to the application and provide the attachment number in the space instead.

Explanation:

If **yes** to all three questions in section c above, proceed to section d. If **no** to any of the questions in section c above the facility does not meet the minimum criteria to be subject to the full requirements of 316(b). Complete Worksheet 11.0, items 1(a), 1(b)(i-iii) and (vi), 2(b)(i), and 3(a) to allow for a determination based upon best professional judgement (BPJ).

d. Phase I vs Phase II Facilities

1. Existing facility (Phase II)

☐ Yes ☐ No

If **yes**, complete Worksheets 11.0 through 11.3, as applicable. Otherwise, continue.

2. New Facility – (Phase I)

☐ Yes ☐ No

If **yes**, continue.

3. Compliance track selection (For Phase I only; must choose one of the following)

☐ Track I - AIF greater than 2 MGD, but less than 10 MGD

If selected, include information required under *40 CFR §§ 125.86(b)(2)-(4)* as an attachment and complete Worksheet 11.0, items 2 and 3, and Worksheet 11.2.

☐ Track I - AIF greater than 10 MGD

If selected, include information required under *40 CFR § 125.86(b)* as an attachment and complete Worksheet 11.0, items 2 and 3, and Worksheet 11.2.

☐ Track II

If selected, include information required under *40 CFR § 125.86(c)* as an attachment and complete Worksheet 11.0, items 2 and 3, and Worksheet 11.2.

Attachment:

Note: Items 12, 13, and 14 are required only for **existing permitted** facilities.

13. MAJOR AMENDMENT REQUESTS (Instructions, Page 46)

Are you requesting a major amendment of an existing permit?

☐ Yes ☒ No

If **yes**, list each specific request and provide discussion on the scope of any requested permit changes. If necessary, provide supplemental information or additional data that will support the request.

14. MINOR MODIFICATION REQUESTS (Instructions, Page 47)

Are you requesting any minor modifications to the permit? Note: see the instructions for an exclusive list of changes considered as minor modifications.

☐ Yes ☒ No

If **yes**, list and discuss the requested changes.

15. MINOR AMENDMENT REQUESTS (Instructions, Page 47)

Are you requesting any minor amendments to the permit?

☐ Yes ☒ No

If **yes**, list and discuss the requested changes.

WORKSHEET 1.0

EPA CATEGORICAL EFFLUENT GUIDELINES

This worksheet is required for all applications for TPDES permits for discharges of wastewaters subject to EPA categorical effluent guidelines.

1. CATEGORICAL INDUSTRIES (Instructions, Pages 50-51)

Is your facility subject to any of the 40 CFR effluent guidelines outlined on page 52 of the instructions?

☒ Yes ☐ No

If **yes**, provide the appropriate information in the table below.

If **no**, this worksheet is not required.

40 CFR Effluent Guidelines

Industry	40 CFR Part
Organic Chemicals, Plastics and Synthetic Fibers	414

2. PRODUCTION/PROCESS DATA (Instructions, Page 51)

a. Production Data

Provide the appropriate data for effluent guidelines with production-based effluent limitations.

Production Data

Subcategory	Actual Quantity/Day	Design Quantity/Day	Units
N/A			

b. Organic Chemicals, Plastics, and Synthetic Fibers Manufacturing Data (40 CFR Part 414)

Provide each appropriate subpart and the percent of total production. Also provide the appropriate data for metal-bearing wastestreams as required in 40 CFR Part 414, Appendices A and B.

Percentages of Total Production

Subcategory	Percent of Total Production	Appendix A and B - Metal	Appendix A and B – Process
E (Thermosetting Resins)	13.5	N/A	N/A
F (Commodity Organic Chemicals)	20	N/A	N/A
G (Bulk Organic Chemicals)	46	N/A	N/A
H (Specialty Chemicals)	20.5	N/A	N/A

c. Refineries (40 CFR Part 419):

Provide the applicable subcategory and a brief justification.

N/A

3. PROCESS/NON-PROCESS WASTEWATER FLOWS (Instructions, Page 51)

Provide a breakdown of process wastewater flow(s) and non-process wastewater flow(s) as directed.

Process Flows – 25,590 gpd
Non Process Flows – 3,000 gpd

See Attachment #6

4. NEW SOURCE DETERMINATION (Instructions, Page 51)

Provide a list of wastewater-generating processes subject to effluent guidelines and the appropriate information.

Wastewater-generating Processes Subject to Effluent Guidelines

Process	EPA Guideline: Part	EPA Guideline: Subpart	Date Process/ Construction Commenced
E (Thermosetting Resins)	414	E	1988
F (Commodity Organic Chemicals)	414	F	1988
G (Bulk Organic Chemicals)	414	G	1988
H (Specialty Chemicals)	414	H	1988

WORKSHEET 2.0

POLLUTANT ANALYSES REQUIREMENTS

Worksheet 2.0 is **required** for applications submitted for a TPDES permit.


Worksheet 2.0 is **not required** for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater runoff.

1. LABORATORY ACCREDITATION (Instructions, Page 52)

Effective July 1, 2008, all laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification* with the following general exemptions:

- a. The laboratory is an in-house laboratory and is:
 1. periodically inspected by the TCEQ; or
 2. located in another state and is accredited or inspected by that state; or
 3. performing work for another company with a unit located in the same site; or
 4. performing pro bono work for a governmental agency or charitable organization.
- b. The laboratory is accredited under federal law.
- c. The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- d. The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review *30 TAC Chapter 25* for specific requirements. The following certification statement shall be signed and submitted with every application. See Instructions, Page 32, for a list of designated representatives who may sign the certification.

I, , certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*.

2. GENERAL TESTING REQUIREMENTS (Instructions, Pages 52-54)

Please read the general testing requirements in the instructions for important information about sampling, test methods, MALs, and averaging sample results.

3. SPECIFIC TESTING REQUIREMENTS (Instructions, Pages 54-66)

Table 1 and Table 2 (Instructions, Page 54)

Completion of Tables 1 and 2 is required for all external outfalls for new, renewal, and amendment applications.

Table 1 for Outfall No.: 001Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	Average (mg/L)
BOD (5-day)	2.79	U (2.0)	U (2.0)	2.73	1.38
CBOD (5-day)	2.28	U (2.0)	2.9	2.2	1.85
Chemical oxygen demand	22.0	97.0	48	118	71.25
Total organic carbon	24.1	3.76	5.13	25.6	14.65
Dissolved oxygen	6.43	6.01	9.58	9.16	7.79
Ammonia nitrogen	0.092	0.038	0.013	0.071	0.054
Total suspended solids	4.63	12.6	U (2.0)	2.53	5.19
Nitrate nitrogen	U (0.03)	0.0781	0.0154	0.0114	0.02
Total organic nitrogen	U (0.50)	U (0.50)	0.87	U (0.50)	0.23
Total phosphorus	0.0340	U	U	U	0.0085
Oil and grease	2.61	2.33	U (2.00)	1.86	1.70
Total residual chlorine	U	U	U	U	<0.10
Total dissolved solids	96.0	270	124	302	198
Sulfate	7.24	36.9	15.6	33.4	23.29
Chloride	8.97	59.4	29.9	50.9	37.29
Fluoride	U	1.62	.0982	4.12	1.68
Total alkalinity (mg/L as CaCO ₃)	37.8	213	54.1	369	168.48
Temperature (°F)	55.04	66.92	76.64	68	66.65
pH (standard units)	6.80	7.94	7.62	7.99	7.59

Table 2 for Outfall No.: 001Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Average (µg/L)	MAL (µg/L)
Aluminum, total	239	43.6	249	46.3	145.15	2.5
Antimony, total	U	1.08	U	0.756	0.5	5
Arsenic, total	1.54 J	0.766	0.861	0.449	0.904	0.5
Barium, total	43.5	34.6	28.5	57.4	41.0	3
Beryllium, total	U	U	U	U	<0.5	0.5
Cadmium, total	0.08 J	U	U (0.077)	0.08 J	0.04	1
Chromium, total	1.27 J	0.406 J	0.871	0.654	0.800	3
Chromium, hexavalent	U	U	U	U	U	3
Chromium, trivalent	1.00 Jn	1.04 J	U (0.251)	U (0.251)	0.354	N/A
Copper, total	4.52	2.25	4.43	2.82	3.51	2
Cyanide, available	ND	ND	ND	ND	< 2/10	2/10
Lead, total	See Attachment	0.349	U (0.120)	U (0.120)	2.11	0.5
Mercury, total	0.00453	U	U	U	0.0011	0.005/0.0005
Nickel, total	2.84	1.02 J	2.01 J	1.28 J	1.79	2
Selenium, total	U	U	U	U	<5	5
Silver, total	0.071 J	U	1.01	U	<0.5	0.5
Thallium, total	U	U	U	U	<0.5	0.5
Zinc, total	25.7	25.3	41.1	30.5	30.65	5.0

TABLE 3 (Instructions, Page 54).

Completion of Table 3 is required for all external outfalls which discharge process wastewater.

Partial completion of Table 3 is required for all external outfalls with non-process wastewater discharges.

For discharges of stormwater runoff commingled with other wastestreams, complete Table 3 as instructed

Table 3 for Outfall No.: 001

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Samp. 1 (µg/L)*	Samp. 2 (µg/L)*	Samp. 3 (µg/L)*	Samp. 4 (µg/L)*	Avg. (µg/L)*	MAL (µg/L)*
Acrylonitrile	U	U	U	U	<50	50
Anthracene	U	U	U	U	<10	10
Benzene	U	U	U	U	<10	10
Benzidine	U	U	U	U	<50	50
Benzo(a)anthracene	U	U	U	U	<	5
Benzo(a)pyrene	U	U	U	U	<5	5
Bis(2-chloroethyl)ether	U	U	U	U	<10	10
Bis(2-ethylhexyl)phthalate	U	U	U	U (0.808)	<0.808	10
Bromodichloromethane [Dichlorobromomethane]	U	U	U	U	<10	10
Bromoform	U	U	U	U	<10	10
Carbon tetrachloride	U	U	U	U	<2	2
Chlorobenzene	U	U	U	U	<10	10
Chlorodibromomethane [Dibromochloromethane]	U	U	U	U	<10	10
Chloroform	U	U	U (0.6)	U (0.6)	<0.6	10
Chrysene	U	U	U	U	<5	5
m-Cresol [3-Methylphenol]	U	U	U	U	<10	10
o-Cresol [2-Methylphenol]	U	U	U	U	<10	10
p-Cresol [4-Methylphenol]	U	U	U	U	<10	10
1,2-Dibromoethane	U	U	U	U	<10	10
m-Dichlorobenzene [1,3-Dichlorobenzene]	U	U	U	U	<10	10
o-Dichlorobenzene [1,2-Dichlorobenzene]	U	U	U	U	<10	10
p-Dichlorobenzene [1,4-Dichlorobenzene]	U	U	U	U	<10	10
3,3'-Dichlorobenzidine	U	U	U	U	<5	5
1,2-Dichloroethane	U	U	U	U	<10	10
1,1-Dichloroethene [1,1-Dichloroethylene]	U	U	U	U	<10	10
Dichloromethane [Methylene chloride]	U	U	U	U	<20	20
1,2-Dichloropropane	U	U	U	U	<10	10
1,3-Dichloropropene [1,3-Dichloropropylene]	U	U	U	U	<10	10
2,4-Dimethylphenol	U	U	U	U	<10	10

Pollutant	Samp. 1 (µg/L)*	Samp. 2 (µg/L)*	Samp. 3 (µg/L)*	Samp. 4 (µg/L)*	Avg. (µg/L)*	MAL (µg/L)*
Di-n-Butyl phthalate	U	U	U	U	<10	10
Ethylbenzene	U	U	U	U	<10	10
Fluoride	U	U	U	U	<	500
Hexachlorobenzene	U	U	U	U	<5	5
Hexachlorobutadiene	U	U	U	U	<10	10
Hexachlorocyclopentadiene	U	U	U	U	<10	10
Hexachloroethane	U	U	U	U	<20	20
Methyl ethyl ketone	U	U	U	U	<50	50
Nitrobenzene	U	U	U	U	<10	10
N-Nitrosodiethylamine	U	U	U	U	<20	20
N-Nitroso-di-n-butylamine	U	U	U	U	<20	20
Nonylphenol	U	U	U	U	<333	333
Pentachlorobenzene	U	U	U	U	<20	20
Pentachlorophenol	U	U	U	U	<5	5
Phenanthrene	U	U	U	U	<10	10
Polychlorinated biphenyls (PCBs) (**)	U	U	U	U	<0.2	0.2
Pyridine	U	U	U	U	<20	20
1,2,4,5-Tetrachlorobenzene	U	U	U	U	<20	20
1,1,2,2-Tetrachloroethane	U	U	U	U	<10	10
Tetrachloroethene [Tetrachloroethylene]	U	U	U	U	<10	10
Toluene	U	U	U	U	<10	10
1,1,1-Trichloroethane	U	U	U	U	<10	10
1,1,2-Trichloroethane	U	U	U	U	<10	10
Trichloroethene [Trichloroethylene]	U	U	U	U	<10	10
2,4,5-Trichlorophenol	U	U	U	U	<50	50
TTHM (Total trihalomethanes)	U	U	U (0.5)	U (0.5)	<0.5	10
Vinyl chloride	U	U	U	U	<10	10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

TABLE 4 (Instructions, Page 55

Partial completion of Table 4 (only those pollutants which are required by the conditions specified below) **is required** for each external outfall.

Completion of Table 4 **is not required** for internal outfalls.

a. Tributyltin

Is your facility an industrial/commercial facility which directly disposes of wastewater from the types of operations listed below or a domestic facility which receives wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, indicate all of the following criteria which apply and provide the appropriate testing results in the table below.

- ☐ Manufacturers and formulators of tributyltin or related compounds
- ☐ Painting of ships, boats and marine structures
- ☐ Ship and boat building and repairing
- ☐ Ship and boat cleaning, salvage, wrecking and scaling
- ☐ Operation and maintenance of marine cargo handling facilities and marinas
- ☐ Facilities engaged in wood preserving
- ☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. Enterococci

Does or will your facility discharge **directly** into **saltwater** receiving waters **and**:
Enterococci bacteria are expected to be present in the discharge based on facility processes?

☐ Yes ☒ No

Domestic wastewater is or will be discharged?

☒ Yes ☐ No

If **yes** to either question, provide the appropriate testing results in Table 4 below.

c. E. coli

Does or will your facility discharge **directly** into **freshwater** receiving waters **and**:
E. coli bacteria are expected to be present in the discharge based on facility processes?

☐ Yes ☒ No

Domestic wastewater is or will be discharged?

☒ Yes ☐ No

If **yes** to either question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: 001

Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	Average	MAL
Tributyltin (µg/L)	N/A	N/A	N/A	N/A	N/A	0.010
Enterococci (cfu or MPN/100 mL)	2& &\$	6F@	BRL	BRL		N/A
E. coli (cfu or MPN/100 mL)	&(%\$	>6F@	BRL	BRL		N/A

TABLE 5 (Instructions, Page 56)

Completion of Table 5 **is required** for all external outfalls which discharge process wastewater or other wastewaters which may contain pesticides or herbicides from a facility which manufactures or formulates pesticides or herbicides. Completion of Table 5 **is not required** for internal outfalls.

Does your facility manufacture or formulate pesticides or herbicides?

☐ Yes ☒ No

If **yes**, provide the appropriate testing results in Table 5.

Table 5 for Outfall No.: N/A

Samples are (check one): ☐ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	Average (µg/L)*	MAL (µg/L)*
Aldrin						0.01
Carbaryl						5
Chlordane						0.2
Chlorpyrifos						0.05
4,4'-DDD						0.1
4,4'-DDE						0.1
4,4'-DDT						0.02
2,4-D						0.7
Danitol [Fenprothrin]						—
Demeton						0.20
Diazinon						0.5/0.1
Dicofol [Kelthane]						1
Dieldrin						0.02
Diuron						0.090
Endosulfan I (<i>alpha</i>)						0.01
Endosulfan II (<i>beta</i>)						0.02
Endosulfan sulfate						0.1
Endrin						0.02
Guthion [Azinphos methyl]						0.1
Heptachlor						0.01
Heptachlor epoxide						0.01
Hexachlorocyclohexane (<i>alpha</i>)						0.05
Hexachlorocyclohexane (<i>beta</i>)						0.05
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]						0.05
Hexachlorophene						10
Malathion						0.1
Methoxychlor						2.0
Mirex						0.02
Parathion (ethyl)						0.1
Toxaphene						0.3
2,4,5-TP [Silvex]						0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 56)

Completion of Table 6 is required for all external outfalls but is not required for internal outfalls.

Table 6 for Outfall No.: 001

Samples are (check one): ☐ Composites ☒ Grabs

Pollutants	Believed Present	Believed Absent	Average Concentration (mg/L)	Maximum Concentration (mg/L)	No. of Samples	MAL (µg/L)*
Bromide	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.0685	0.229	4	400
Color (PCU)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.5	30	4	—
Nitrate-Nitrite (as N)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.052	0.164	4	—
Sulfide (as S)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.68	12.5	4	—
Sulfite (as SO ₃)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<5	<5	4	—
Surfactants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.0228	0.035	4	—
Boron, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.106	0.163	4	20
Cobalt, total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.0000873	0.000173	4	0.3
Iron, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.17	0.58	4	7
Magnesium, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.4	13.2	4	20
Manganese, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.010	0.0277	4	0.5
Molybdenum, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.0152	0.0396	4	1
Tin, total	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.00006	0.00015	4	5
Titanium, total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.00068	0.00147	4	30

* Indicate units if different from µg/L.

TABLE 7 (Instructions, Page 56)

Indicate any of the industrial categories applicable to your facility; otherwise, check the “N/A” box below. If GC/MS testing is required, indicate with an ‘x’ in the box provided that the testing results for the appropriate parameters are provided with the application.

☐ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
<input type="checkbox"/> Adhesives and Sealants		<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Aluminum Forming	467	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Auto and Other Laundries		<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Battery Manufacturing	461	<input type="checkbox"/> Yes	No	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Coal Mining	434	No	No	No	No
<input type="checkbox"/> Coil Coating	465	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Copper Forming	468	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Electric and Electronic Components	469	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Electroplating	413	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Explosives Manufacturing	457	No	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Foundries		<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Gum and Wood Chemicals - Subparts A,B,C,E	454	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No	No
<input type="checkbox"/> Gum and Wood Chemicals - Subparts D,F	454	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Inorganic Chemicals Manufacturing	415	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Iron and Steel Manufacturing	420	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Leather Tanning and Finishing	425	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Mechanical Products Manufacturing		<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Nonferrous Metals Manufacturing	421,471	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Ore Mining - Subpart B	440	No	<input type="checkbox"/> Yes	No	No
<input checked="" type="checkbox"/> Organic Chemicals Manufacturing	414	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
<input type="checkbox"/> Paint and Ink Formulation	446,447	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Pesticides	455	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Petroleum Refining	419	<input type="checkbox"/> Yes	No	No	No
<input type="checkbox"/> Pharmaceutical Preparations	439	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Photographic Equipment and Supplies	459	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Plastic and Synthetic Materials Manufacturing	414	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Plastic Processing	463	<input type="checkbox"/> Yes	No	No	No
<input type="checkbox"/> Porcelain Enameling	466	No	No	No	No
<input type="checkbox"/> Printing and Publishing		<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> Pulp and Paperboard Mills - Subpart C	430	<input type="checkbox"/> *	<input type="checkbox"/> Yes	<input type="checkbox"/> *	<input type="checkbox"/> Yes
<input type="checkbox"/> Pulp and Paperboard Mills - Subparts F, K	430	<input type="checkbox"/> *	<input type="checkbox"/> Yes	<input type="checkbox"/> *	<input type="checkbox"/> *
<input type="checkbox"/> Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> *	<input type="checkbox"/> *
<input type="checkbox"/> Pulp and Paperboard Mills - Subparts I, J, L	430	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> *	<input type="checkbox"/> Yes
<input type="checkbox"/> Pulp and Paperboard Mills - Subpart E	430	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> *
<input type="checkbox"/> Rubber Processing	428	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Soap and Detergent Manufacturing	417	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Steam Electric Power Plants	423	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No	No
<input type="checkbox"/> Textile Mills (Not Subpart C)	410	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	No
<input type="checkbox"/> Timber Products Processing	429	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Pages 56-57)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all external outfalls that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **is not required** for internal outfalls.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 001: Volatile Compounds

Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
Acrolein	<50	<50	4	50
Acrylonitrile	<50	<50	4	50
Benzene	<10	<10	4	10
Bromoform	<10	<10	4	10
Carbon tetrachloride	<2	<2	4	2
Chlorobenzene	<10	<10	4	10
Chlorodibromomethane	<10	<10	4	10
Chloroethane	<50	<50	4	50
2-Chloroethylvinyl ether	<10	<10	4	10
Chloroform	0.427	0.808	4	10
Dichlorobromomethane [Bromodichloromethane]	<10	<10	4	10
1,1-Dichloroethane	<10	<10	4	10
1,2-Dichloroethane	<10	<10	4	10
1,1-Dichloroethylene [1,1-Dichloroethene]	<10	<10	4	10
1,2-Dichloropropane	<10	<10	4	10
1,3-Dichloropropylene [1,3-Dichloropropene]	<10	<10	4	10
Ethylbenzene	<10	<10	4	10
Methyl bromide [Bromomethane]	<50	<50	4	50
Methyl chloride [Chloromethane]	<50	<50	4	50
Methylene chloride [Dichloromethane]	<20	<20	4	20
1,1,2,2-Tetrachloroethane	<10	<10	4	10
Tetrachloroethylene [Tetrachloroethene]	<10	<10	4	10
Toluene	<10	<10	4	10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	<10	<10	4	10
1,1,1-Trichloroethane	<10	<10	4	10
1,1,2-Trichloroethane	<10	<10	4	10
Trichloroethylene [Trichloroethene]	<10	<10	4	10
Vinyl chloride	<10	<10	4	10

Table 9 for Outfall No.: 001: Acid CompoundsSamples are (check one): ☐ Composites ☒ Grabs

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
2-Chlorophenol	<10	<10	4	10
2,4-Dichlorophenol	<10	<10	4	10
2,4-Dimethylphenol	<10	<10	4	10
4,6-Dinitro-o-cresol	<50	<50	4	50
2,4-Dinitrophenol	<50	<50	4	50
2-Nitrophenol	<20	<20	4	20
4-Nitrophenol	<50	<50	4	50
p-Chloro-m-cresol	<10	<10	4	10
Pentachlorophenol	<5	<5	4	5
Phenol	<10	<10	4	10
2,4,6-Trichlorophenol	<10	<10	4	10

Table 10 for Outfall No.: 001: Base/Neutral CompoundsSamples are (check one): ☐ Composites ☒ Grabs

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
Acenaphthene	<10	<10	4	10
Acenaphthylene	<10	<10	4	10
Anthracene	<10	<10	4	10
Benzidine	<50	<10	4	50
Benzo(a)anthracene	0.207	0.373	4	5
Benzo(a)pyrene	<5	<5	4	5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<10	<10	4	10
Benzo(ghi)perylene	<20	<20	4	20
Benzo(k)fluoranthene	<5	<5	4	5
Bis(2-chloroethoxy)methane	<10	<10	4	10
Bis(2-chloroethyl)ether	<10	<10	4	10
Bis(2-chloroisopropyl)ether	<10	<10	4	10
Bis(2-ethylhexyl)phthalate	0.67	1.45	4	10
4-Bromophenyl phenyl ether	<10	<10	4	10
Butylbenzyl phthalate	<10	<10	4	10
2-Chloronaphthalene	<10	<10	4	10
4-Chlorophenyl phenyl ether	<10	<10	4	10
Chrysene	<5	<5	4	5
Dibenzo(a,h)anthracene	<5	<5	4	5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<10	<10	4	10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<10	<10	4	10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<10	<10	4	10

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
3,3'-Dichlorobenzidine	<5	<5	4	5
Diethyl phthalate	<10	<10	4	10
Dimethyl phthalate	<10	<10	4	10
Di-n-butyl phthalate	<10	<10	4	10
2,4-Dinitrotoluene	<10	<10	4	10
2,6-Dinitrotoluene	<10	<10	4	10
Di-n-octyl phthalate	<10	<10	4	10
1,2-Diphenylhydrazine (as Azobenzene)	<20	<20	4	20
Fluoranthene	<10	<10	4	10
Fluorene	<10	<10	4	10
Hexachlorobenzene	<5	<5	4	5
Hexachlorobutadiene	<10	<10	4	10
Hexachlorocyclopentadiene	<10	<10	4	10
Hexachloroethane	<20	<20	4	20
Indeno(1,2,3-cd)pyrene	<5	<5	4	5
Isophorone	<10	<10	4	10
Naphthalene	<10	<10	4	10
Nitrobenzene	<10	<10	4	10
N-Nitrosodimethylamine	<50	<50	4	50
N-Nitrosodi-n-propylamine	<20	<20	4	20
N-Nitrosodiphenylamine	<20	<20	4	20
Phenanthrene	<10	<10	4	10
Pyrene	<10	<10	4	10
1,2,4-Trichlorobenzene	<10	<10	4	10

Table 11 for Outfall No.: 001: Pesticides

Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
Aldrin	<0.01	<0.01	4	0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	0.00175	0.00342	4	0.05
beta-BHC [beta-Hexachlorocyclohexane]	0.00116	0.00456	4	0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	0.00212	0.00446	4	0.05
delta-BHC [delta-Hexachlorocyclohexane]	0.00752	0.00505	4	0.05
Chlordane	<0.2	<0.2	4	0.2
4,4'-DDT	0.00261	0.0102	4	0.02
4,4'-DDE	<0.1	<0.1	4	0.1
4,4'-DDD	<0.1	<0.1	4	0.1
Dieldrin	0.00093	0.00364	4	0.02
Endosulfan I (alpha)	0.00691	0.0226	4	0.01
Endosulfan II (beta)	<0.02	<0.02	4	0.02

Pollutant	Average (µg/L)*	Maximum (µg/L)*	No. of Samples	MAL (µg/L)
Endosulfan sulfate	<0.1	<0.1	4	0.1
Endrin	0.00484	0.0191	4	0.02
Endrin aldehyde	<0.1	<0.1	4	0.1
Heptachlor	0.00158	0.0034	4	0.01
Heptachlor epoxide	0.000273	0.00105	4	0.01
PCB 1242	<0.2	<0.2	4	0.2
PCB 1254	<0.2	<0.2	4	0.2
PCB 1221	<0.2	<0.2	4	0.2
PCB 1232	<0.2	<0.2	4	0.2
PCB 1248	<0.2	<0.2	4	0.2
PCB 1260	<0.2	<0.2	4	0.2
PCB 1016	<0.2	<0.2	4	0.2
Toxaphene	<0.3	<0.3	4	0.3

* Indicate units if different from µg/L

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete Table 12 as directed. Table 12 is not required for internal outfalls. (Instructions, Pages 57-58)

a. Are any of the following compounds manufactured or used in a process at the facility?

☐ Yes ☒ No

If **yes**, indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility.

- | | | |
|--|--------------------|----------------|
| <input type="checkbox"/> 2,4,5-trichlorophenoxy acetic acid | (2,4,5-T) | CASRN 93-76-5 |
| <input type="checkbox"/> 2-(2,4,5-trichlorophenoxy) propanoic acid | (Silvex, 2,4,5-TP) | CASRN 93-72-1 |
| <input type="checkbox"/> 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate | (Erbon) | CASRN 136-25-4 |
| <input type="checkbox"/> 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate | (Ronnel) | CASRN 299-84-3 |
| <input type="checkbox"/> 2,4,5-trichlorophenol | (TCP) | CASRN 95-95-4 |
| <input type="checkbox"/> hexachlorophene | (HCP) | CASRN 70-30-4 |

Description:

b. Do you know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in your effluent?

☐ Yes ☒ No

If yes, provide a brief description of the conditions for its presence.

c. If you responded **yes** to either Item a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A

Samples are (check one): ☐ **Composites** ☐ **Grabs**

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	0.5					50
2,3,7,8-HxCDDs	0.1					50
1,2,3,4,6,7,8-HpCDD	0.01					50
2,3,7,8-TCDF	0.1					10
1,2,3,7,8-PeCDF	0.05					50
2,3,4,7,8-PeCDF	0.5					50
2,3,7,8-HxCDFs	0.1					50
2,3,4,7,8-HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					500
PCB 81	0.0003					500
PCB 126	0.1					500
PCB 169	0.03					500
Total						

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 as directed. Not required for internal outfalls. (Instructions, Pages 58-59)

- a. Are there any pollutants listed in the instructions (page 60) believed present in the discharge?

☒ Yes ☐ No

- b. Are there pollutants listed in Item 1.d. on page 1 of this technical report which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☒ Yes ☐ No

If you responded **yes** to **either** Item a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 001

Samples are (check one): ☐ Composites ☒ Grabs

[illegible]

WORKSHEET 4.0 RECEIVING WATERS

Outfall 001

This worksheet **is required** for all renewal, amendment, and new TPDES permit applications.

1. DOMESTIC DRINKING WATER SUPPLY (Instructions, Page 78)

Is there a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge?

☐ Yes ☒ No

If **yes**, identify owner of the drinking water supply, the distance and direction to the intake, and locate and identify the intake on the USGS map.

☐ Indicate with an 'x' in the box that the requested information is provided.

2. DISCHARGE INTO TIDALLY INFLUENCED WATERS (Instructions, Page 78)

a. Width of the receiving water at the outfall? N/A feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, indicate approximate distance and direction from outfall(s):

c. Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction to the grasses:

3. CLASSIFIED SEGMENT (Instructions, Page 78)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☒ No

If **yes, stop here**. It is not necessary to complete Items 4 and 5, and it is not necessary to complete Worksheet 4.1.

If **no**, complete Items 4 and 5.

4. DESCRIPTION OF IMMEDIATE RECEIVING WATERS (Instructions, Page 79)

Name of the immediate receiving waters: Dow Chemical Plant "A" Effluent Canal

a. Check the appropriate description of the receiving waters

- | | |
|--|---|
| <input type="checkbox"/> Lake or Pond | <input checked="" type="checkbox"/> Man-made Channel or Ditch |
| Surface area (acres): <u>1.111111111111111</u> | <input type="checkbox"/> Stream or Creek |
| Average depth of the entire water body (feet): <u>1.111111111111111</u> | <input type="checkbox"/> Freshwater Swamp or Marsh |
| Average depth of water body within a 500-foot radius of the discharge point (feet): <u>1.111111111111111</u> | <input type="checkbox"/> Tidal Stream, Bayou, or Marsh |
| | <input type="checkbox"/> Open Bay |
| | <input type="checkbox"/> Other: <u>1.111111111111111</u> |

If you checked "man-made channel or ditch" or "stream or creek" above, provide responses to items b - e below:

b. For existing discharges, check the description below that best characterizes the area upstream of the discharge.

For new discharges, check the description below that best characterizes the area downstream of the discharge.

- ☐ Intermittent (dry for at least one week during most years)
- ☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)
- ☒ Perennial (normally flowing)

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

- ☐ USGS flow records
- ☒ personal observation
- ☐ historical observation by adjacent landowner(s)
- ☐ others, specify: 1.111111111111111

c. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point:

N/A

d. Do the receiving water characteristics change within three miles downstream of the discharge? (e.g., natural or man-made dams, ponds, reservoirs, etc.)

- ☐ Yes ☒ No

If yes, discuss how:

1.111111111111111

- e. Provide general observations of the water body during normal dry weather conditions:

Normally flowing during normal dry weather conditions.

Date and time of observation: 10/11/23 @ 12:30 PM

Was water body influenced by stormwater runoff during observations?

☐ Yes ☒ No

5. GENERAL CHARACTERISTICS OF WATER BODY (Instructions, Page 79)

- a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by (check as appropriate):

☐ oil field activities
☐ agricultural runoff
☒ upstream discharges

☐ urban runoff
☐ septic tanks
☐ others, specify: [click here to enter text](#)

- b. Uses of water body observed or evidence of such uses (check as appropriate):

☐ livestock watering
☐ non-contact recreation
☐ domestic water supply

☐ contact recreation
☐ fishing
☐ industrial water supply
☐ irrigation withdrawal

☐ navigation
☐ picnic park activities
☐ others, specify: [click here to enter text](#)

- c. Check the description (only one) that best describes the aesthetics of the receiving water and the surrounding area:

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area: water clarity exceptional
☒ Natural Area: trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored
☐ Common Setting: not offensive, developed but uncluttered; water may be colored or turbid
☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

WORKSHEET 4.0 RECEIVING WATERS

Outfall 002

This worksheet **is required** for all renewal, amendment, and new TPDES permit applications.

1. DOMESTIC DRINKING WATER SUPPLY (Instructions, Page 78)

Is there a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge?

☐ Yes ☒ No

If **yes**, identify owner of the drinking water supply, the distance and direction to the intake, and locate and identify the intake on the USGS map.

☐ Indicate with an 'x' in the box that the requested information is provided.

2. DISCHARGE INTO TIDALLY INFLUENCED WATERS (Instructions, Page 78)

a. Width of the receiving water at the outfall? N/A feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, indicate approximate distance and direction from outfall(s):

c. Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction to the grasses:

3. CLASSIFIED SEGMENT (Instructions, Page 78)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☒ No

If **yes, stop here**. It is not necessary to complete Items 4 and 5, and it is not necessary to complete Worksheet 4.1.

If **no**, complete Items 4 and 5.

4. DESCRIPTION OF IMMEDIATE RECEIVING WATERS (Instructions, Page 79)

Name of the immediate receiving waters: Unnamed stormwater drainage ditch

a. Check the appropriate description of the receiving waters

☐ Lake or Pond

Surface area (acres): Click here to enter text.

Average depth of the entire water body
(feet): Click here to enter text.

Average depth of water body within a 500-
foot radius of the discharge point (feet):
Click here to enter text.

☒ Man-made Channel or Ditch

☐ Stream or Creek

☐ Freshwater Swamp or Marsh

☐ Tidal Stream, Bayou, or Marsh

☐ Open Bay

☐ Other: Click here to enter text.

If you checked "man-made channel or ditch" or "stream or creek" above, provide responses to items b - e below:

b. For existing discharges, check the description below that best characterizes the area upstream of the discharge.

For new discharges, check the description below that best characterizes the area downstream of the discharge.

☐ Intermittent (dry for at least one week during most years)

☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)

☒ Perennial (normally flowing)

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☐ USGS flow records

☒ personal observation

☐ historical observation by adjacent landowner(s)

☐ others, specify: Click here to enter text.

c. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point:

Old Brazos River Segment No. 1111

d. Do the receiving water characteristics change within three miles downstream of the discharge? (e.g., natural or man-made dams, ponds, reservoirs, etc.)

☐ Yes ☒ No

If yes, discuss how:

- e. Provide general observations of the water body during normal dry weather conditions:

Generally flowing during normal dry weather conditions.

Date and time of observation: 10/11/23 12:30 pm

Was water body influenced by stormwater runoff during observations?

☐ Yes ☒ No

5. GENERAL CHARACTERISTICS OF WATER BODY (Instructions, Page 79)

- a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by (check as appropriate):

<input type="checkbox"/> oil field activities	<input type="checkbox"/> urban runoff
<input type="checkbox"/> agricultural runoff	<input type="checkbox"/> septic tanks
<input checked="" type="checkbox"/> upstream discharges	<input type="checkbox"/> others, specify: Click here to enter text.

- b. Uses of water body observed or evidence of such uses (check as appropriate):

<input type="checkbox"/> livestock watering	<input type="checkbox"/> contact recreation	<input type="checkbox"/> navigation
<input type="checkbox"/> non-contact recreation	<input type="checkbox"/> fishing	<input type="checkbox"/> picnic park activities
<input type="checkbox"/> domestic water supply	<input type="checkbox"/> industrial water supply	<input type="checkbox"/> others, specify:
	<input type="checkbox"/> irrigation withdrawal	

- c. Check the description (only one) that best describes the aesthetics of the receiving water and the surrounding area:

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area: water clarity exceptional

☐ Natural Area: trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☒ Common Setting: not offensive, developed but uncluttered; water may be colored or turbid

☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

WORKSHEET 4.0 RECEIVING WATERS

Outfall 003 & 004

This worksheet **is required** for all renewal, amendment, and new TPDES permit applications.

1. DOMESTIC DRINKING WATER SUPPLY (Instructions, Page 78)

Is there a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge?

☐ Yes ☒ No

If **yes**, identify owner of the drinking water supply, the distance and direction to the intake, and locate and identify the intake on the USGS map.

☐ Indicate with an 'x' in the box that the requested information is provided.

2. DISCHARGE INTO TIDALLY INFLUENCED WATERS (Instructions, Page 78)

a. Width of the receiving water at the outfall? N/A feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, indicate approximate distance and direction from outfall(s):

c. Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction to the grasses:

3. CLASSIFIED SEGMENT (Instructions, Page 78)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☒ No

If **yes, stop here**. It is not necessary to complete Items 4 and 5, and it is not necessary to complete Worksheet 4.1.

If **no**, complete Items 4 and 5.

4. DESCRIPTION OF IMMEDIATE RECEIVING WATERS (Instructions, Page 79)

Name of the immediate receiving waters: Unnamed stormwater drainage ditch

a. Check the appropriate description of the receiving waters

☐ Lake or Pond

Surface area (acres): Click here to enter text.

Average depth of the entire water body (feet): Click here to enter text.

Average depth of water body within a 500-foot radius of the discharge point (feet): Click here to enter text.

☒ Man-made Channel or Ditch

☐ Stream or Creek

☐ Freshwater Swamp or Marsh

☐ Tidal Stream, Bayou, or Marsh

☐ Open Bay

☐ Other: Click here to enter text.

If you checked "man-made channel or ditch" or "stream or creek" above, provide responses to items b - e below:

b. For existing discharges, check the description below that best characterizes the area upstream of the discharge.

For new discharges, check the description below that best characterizes the area downstream of the discharge.

☒ Intermittent (dry for at least one week during most years)

☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)

☐ Perennial (normally flowing)

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☐ USGS flow records

☒ personal observation

☐ historical observation by adjacent landowner(s)

☐ others, specify: Click here to enter text.

c. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point:

Unnamed stormwater drainage ditch, Old Brazos River Segment No. 1111

d. Do the receiving water characteristics change within three miles downstream of the discharge? (e.g., natural or man-made dams, ponds, reservoirs, etc.)

☐ Yes ☒ No

If yes, discuss how:

- e. Provide general observations of the water body during normal dry weather conditions:

Generally flowing during normal dry weather conditions.

Date and time of observation: 10/11/23 12:30 pm

Was water body influenced by stormwater runoff during observations?

☐ Yes ☒ No

5. GENERAL CHARACTERISTICS OF WATER BODY (Instructions, Page 79)

- a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by (check as appropriate):

<input type="checkbox"/> oil field activities	<input type="checkbox"/> urban runoff
<input type="checkbox"/> agricultural runoff	<input type="checkbox"/> septic tanks
<input type="checkbox"/> upstream discharges	<input checked="" type="checkbox"/> others, specify: <u>stormwater runoff</u>

- b. Uses of water body observed or evidence of such uses (check as appropriate):

<input type="checkbox"/> livestock watering	<input type="checkbox"/> contact recreation	<input type="checkbox"/> navigation
<input type="checkbox"/> non-contact recreation	<input type="checkbox"/> fishing	<input type="checkbox"/> picnic park activities
<input type="checkbox"/> domestic water supply	<input type="checkbox"/> industrial water supply	<input type="checkbox"/> others, specify:
	<input type="checkbox"/> irrigation withdrawal	

- c. Check the description (only one) that best describes the aesthetics of the receiving water and the surrounding area:

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area: water clarity exceptional

☐ Natural Area: trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☒ Common Setting: not offensive, developed but uncluttered; water may be colored or turbid

☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

WORKSHEET 4.0 RECEIVING WATERS

Outfall 005

This worksheet **is required** for all renewal, amendment, and new TPDES permit applications.

1. DOMESTIC DRINKING WATER SUPPLY (Instructions, Page 78)

Is there a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge?

☐ Yes ☒ No

If **yes**, identify owner of the drinking water supply, the distance and direction to the intake, and locate and identify the intake on the USGS map.

☐ Indicate with an 'x' in the box that the requested information is provided.

2. DISCHARGE INTO TIDALLY INFLUENCED WATERS (Instructions, Page 78)

a. Width of the receiving water at the outfall? N/A feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☒ No

If **yes**, indicate approximate distance and direction from outfall(s):

c. Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If **yes**, provide the distance and direction to the grasses:

3. CLASSIFIED SEGMENT (Instructions, Page 78)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☒ No

If **yes, stop here**. It is not necessary to complete Items 4 and 5, and it is not necessary to complete Worksheet 4.1.

If **no**, complete Items 4 and 5.

4. DESCRIPTION OF IMMEDIATE RECEIVING WATERS (Instructions, Page 79)

Name of the immediate receiving waters: Unnamed stormwater drainage ditch

a. Check the appropriate description of the receiving waters

☐ Lake or Pond

Surface area (acres): Click here to enter text.

Average depth of the entire water body
(feet): Click here to enter text.

Average depth of water body within a 500-
foot radius of the discharge point (feet):
Click here to enter text.

☒ Man-made Channel or Ditch

☐ Stream or Creek

☐ Freshwater Swamp or Marsh

☐ Tidal Stream, Bayou, or Marsh

☐ Open Bay

☐ Other: Click here to enter text.

If you checked "man-made channel or ditch" or "stream or creek" above, provide responses to items b - e below:

b. For existing discharges, check the description below that best characterizes the area upstream of the discharge.

For new discharges, check the description below that best characterizes the area downstream of the discharge.

☒ Intermittent (dry for at least one week during most years)

☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)

☐ Perennial (normally flowing)

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☐ USGS flow records

☒ personal observation

☐ historical observation by adjacent landowner(s)

☐ others, specify: Click here to enter text.

c. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point:

N/A

d. Do the receiving water characteristics change within three miles downstream of the discharge? (e.g., natural or man-made dams, ponds, reservoirs, etc.)

☐ Yes ☒ No

If yes, discuss how:

- e. Provide general observations of the water body during normal dry weather conditions:

Generally flowing during normal dry weather conditions.

Date and time of observation: 10/11/23 12:30 pm

Was water body influenced by stormwater runoff during observations?

☐ Yes ☒ No

5. GENERAL CHARACTERISTICS OF WATER BODY (Instructions, Page 79)

- a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by (check as appropriate):

<input type="checkbox"/> oil field activities	<input type="checkbox"/> urban runoff
<input type="checkbox"/> agricultural runoff	<input type="checkbox"/> septic tanks
<input type="checkbox"/> upstream discharges	<input checked="" type="checkbox"/> others, specify: <u>stormwater runoff</u>

- b. Uses of water body observed or evidence of such uses (check as appropriate):

<input type="checkbox"/> livestock watering	<input type="checkbox"/> contact recreation	<input type="checkbox"/> navigation
<input type="checkbox"/> non-contact recreation	<input type="checkbox"/> fishing	<input type="checkbox"/> picnic park activities
<input type="checkbox"/> domestic water supply	<input type="checkbox"/> industrial water supply	<input type="checkbox"/> others, specify:
	<input type="checkbox"/> irrigation withdrawal	

- c. Check the description (only one) that best describes the aesthetics of the receiving water and the surrounding area:

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area: water clarity exceptional

☐ Natural Area: trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☒ Common Setting: not offensive, developed but uncluttered; water may be colored or turbid

☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

WORKSHEET 7.0

STORMWATER RUNOFF

This worksheet is required for all TPDES permit applications requesting individual permit coverage for discharges of stormwater runoff.

1. APPLICABILITY (Instructions, Page 87)

Do discharges from any of the proposed or existing outfalls consist of stormwater runoff only or stormwater runoff and any of the listed non-stormwater discharges on page 88 of the Instructions?

☒ Yes ☐ No

If **yes**, proceed as directed.

If **no**, stop here.

2. STORMWATER OUTFALL COVERAGE (Instructions, Page 88)

Indicate which type of authorization covers or is proposed to cover discharges from each stormwater outfall.

Authorization coverage

Outfall	Authorized Under MSGP	Authorized Under Individual Permit
002	<input type="checkbox"/>	<input checked="" type="checkbox"/>
003	<input type="checkbox"/>	<input checked="" type="checkbox"/>
004	<input type="checkbox"/>	<input checked="" type="checkbox"/>
005	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

If you have indicated that **all** existing or proposed stormwater outfalls are authorized under the MSGP, **stop here**.

If you have indicated that you are seeking authorization for any stormwater outfall under an individual permit, **proceed as directed**.

The following information **is required** for each outfall that discharges stormwater for which you are seeking individual authorization under this permit application.

3. SITE MAP (Instructions, Page 88)

Attach a site map or maps (drawn to scale) of the entire facility with the following information.

Attachment: #5 & #10

- the location of each stormwater outfall to be covered by the permit
- an outline of the drainage area that is within the facility's boundary and that contributes stormwater to each outfall to be covered by the permit
- connections or discharge points to municipal separate storm sewer systems
- locations of all structures (e.g. buildings, garages, storage tanks)
- structural control devices that are designed to reduce pollution in stormwater runoff
- process wastewater treatment units (including ponds)
- bag house and other air treatment units exposed to precipitation or runoff
- landfills; scrapyards; surface water bodies (including wetlands)
- vehicle and equipment maintenance areas
- physical features of the site that may influence stormwater runoff or contribute a dry weather flow
- locations where spills or leaks of reportable quality (as defined in *30 TAC § 327.4*) have occurred during the three years before this application was submitted to obtain coverage under an individual permit
- processing areas, storage areas, material loading/unloading areas, and other locations where significant materials are exposed to precipitation or runoff

☒ Indicate with an 'x' in the box that all the above information was provided on the facility site map(s).

4. FACILITY/SITE INFORMATION (Instructions, Pages 88-89)

- a. Provide the area of impervious surface and the total area drained by each outfall that discharges stormwater for which you are seeking individual authorization under this permit application.

Impervious Surfaces

Outfall	Area of Impervious Surface (include units)	Total Area Drained (include units)
The entire perimeter of the plant at Champion X Freeport is diked to minimize flooding and contamination of stormwater run-off. Stormwater Outfall 003 and 004 are inactive. During dry weather and most rain conditions, Stormwater Outfalls 002 and 005 are also inactive. In rare storm conditions, the stormwater may be pumped over a concrete dike to the drainage ditches and then thru Outfalls 002 or 005.		

- b. Provide the following local area rainfall information and the source of the information. Wettest

month: May 2023

Average rainfall for wettest month (total inches): 8.66"

25-year, 24-hour rainfall (inches): 10 inches

Source: National Weather Service, NOAA

- c. Provide an inventory, or list, of materials currently handled at the facility that may be exposed to precipitation.

See Attachment #11

- d. Provide narrative descriptions of the industrial processes and activities involving the materials in the above-listed inventory that occur outdoors or in some manner that may result in exposure of the materials to precipitation or runoff.

Drainage from potentially chemically contaminated process areas is controlled as follows: all potentially chemically contaminated process areas are routed through drains to chemical sumps A, B, C, D, E, F, G, H, J or K. These sumps have automatic level controls and are pumped to the wastewater system feed tank TK-211. The water from the chemical sump (depending on spill type and volume) can either be stopped at the sump and evacuated to another container, or be allowed to enter the treatment process. Under some severe storm conditions, each sump can be pumped completely to TK-211.

Drainage from low contamination process areas is controlled as follows: all low contamination process areas are routed through trenches and ditches to stormwater sumps 1, 2, 3, 4, 5, 6, or 7. These sumps have automatic level controls and are pumped to the stormwater tank TK-722. Before pumping the contents of TK-722, the tank is circulated, sampled and analyzed for pH and TOC. Under some severe storm conditions, it may be necessary to bypass TK-722 and discharge directly through internal Outfall 201 (then to Outfall 001). In severe rare storm conditions, the stormwater may also be pumped over a concrete dike to the drainage ditches through Outfall 002 and Outfall 005.

- e. Describe any best management practices and controls that you are using to prevent or effectively reduce pollution in stormwater discharges from the facility.

The entire perimeter of the plant at Champion X Freeport, is diked to minimize flooding and contamination of stormwater runoff.

All storage tanks for raw materials, intermediates, and finished products that are liquids at ambient conditions are located inside concrete lined floored areas with secondary containment. Non-process areas are kept clean and free of pollutants. Equipment/Area washdown water is treated and discharged through Internal Outfall 101 and eventually through Outfall 001. Before draining any tank containments, a sample is taken and analyzed for pH and TOC. If the results exceed the SW limits, they route the containments to TK-211.

During dry weather periods and under most rain conditions, Outfall 002, 003, 004, and 005 are normally are inactive. Drainage from low contamination process areas is controlled as follows: all low contamination process areas are routed through trenches and ditches to stormwater sumps 1-7. These sumps have automatic level controls and are pumped to the storm water tank TK-722. Before allowing containments to TK-722, contents are sampled and analyzed with visuals. Before pumping the contents of TK-722, the tank is circulated and then sampled and analyzed for pH and TOC. Under some severe storm conditions, it may be necessary to bypass TK-722 and discharge directly through Internal Outfall 201 (then to Outfall 001).

4e (continued)

During periods of extremely heavy rainfall conditions, the stormwater may also be pumped over a concrete dike to the drainage ditches through Outfall 002, 003, 004, and 005. Champion X analyzes storm water runoff for COD, TOC, and pH to ensure permit exceedances do not occur before discharge.

On-site chemicals used for wastewater treatment and additives for the cooling tower are stored in areas with secondary containment.

Secondary containment areas are isolated through the use of valves which are kept closed. Water within secondary containment is visually inspected before opening the valves and releasing the water. Water which shows evidence of contamination is treated and disposed of properly.

The Spill Prevention, Control, and Countermeasures (SPCC) Plan for the facility contains additional details and best management practices used to prevent and control spills related to oil and/or oil products. All material storage locations are regularly inspected for leaks and spills. In the event of a release, immediate containment and cleanup is conducted. A copy of the current SPCC Plan can be provided upon request. In addition to the measures described above for preventing discharge of oil, the facility uses the service of a 24-hr emergency response contractor to assist in control and clean-up of any spill that is beyond the capability of plant personnel and equipment available.

5. POLLUTANT ANALYSIS (Instructions, Pages 89-91)

- a. Complete Table 17 as directed on page 90 of the Instructions.

Table 17 Pollutant Analysis for Outfall No.: Note: Outfalls 003 and 004 are inactive. No sampling conducted at Outfall 002 and 005 since they are activated only in extreme rare storm conditions.

Pollutant	Grab Sample* Maximum (mg/L)	Composite Sample** Maximum (mg/L)	Grab Sample* Average (mg/L)	Composite Sample** Average (mg/L)	Number of Storm Events Sampled	MAL (mg/L)
pH (standard units)	(max)	—	(min)	—		—
Total suspended solids						—
Chemical oxygen demand						—
Total organic carbon						—
Oil and grease						—
Arsenic, total						0.0005
Barium, total						0.003
Cadmium, total						0.001
Chromium, total						0.003
Chromium, trivalent						—
Chromium, hexavalent						0.003
Copper, total						0.002
Lead, total						0.0005
Mercury, total						0.000005
Nickel, total						0.002
Selenium, total						0.005
Silver, total						0.0005
Zinc, total						0.005

- * Taken during first 30 minutes of storm event
- ** Flow-weighted composite sample

b. Complete Table 18 as directed on pages 90-92 of the Instructions.

Table 18 Pollutant Analysis for Outfall No.: [link here to enter text](#)

Pollutant	Grab Sample* Maximum (mg/L)	Composite Sample** Maximum (mg/L)	Grab Sample* Average (mg/L)	Composite Sample** Average (mg/L)	Number of Storm Events Sampled

- * Taken during first 30 minutes of storm event
- ** Flow-weighted composite sample

6. STORM EVENT DATA (Instructions, Page 91)

Provide the following data for the storm event(s) which resulted in the maximum values for the analytical data submitted:

Date of storm event: [link here to enter text](#)

Duration of storm event (minutes): [link here to enter text](#)

Total rainfall during storm event (inches): [link here to enter text](#)

Number of hours between beginning of storm measured and end of previous measurable rain event (hours): [link here to enter text](#)

Maximum flow rate during rain event (gallons/minute): [link here to enter text](#)

Total stormwater flow from rain event (gallons): [link here to enter text](#)

Provide a description of the method of flow measurement or estimate: [link here to enter text](#)

ADDITIONAL WORKSHEETS **NOT APPLICABLE** TO FACILITY



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Public Notice Verification Form
Notice of Receipt of Application and Intent to Obtain Permit
(NORI)
Water Quality Permit

All applicants must complete this page.

Applicant Name: ChampionX LLC

Site or Facility Name: ChampionX Freeport

Water Quality Permit Number: WQ0001806000

Regulated Entity Number: RN 102185717 Customer Number: CN 602898751

PUBLIC VIEWING LOCATION

I certify that a copy of the complete water quality application, and all revisions, were placed at the following public place for public viewing and copying. I understand that the copy will remain available at the public place from the 1st day of publication of the NORI until the end of the designated comment period. I further understand that the copy will be updated with any revisions to the application.

Name of Public Place: Brazoria County Library System - Freeport Branch

Address of Public Place: 410 Brazosport Blvd., Freeport, TX 77541

Applicant or Applicant Representative Signature: _____

Title: _____ Date: _____



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Public Notice Verification Form
Notice of Receipt of Application and Intent to Obtain Permit
(NORI)
Water Quality Permit

Complete this page only if you are required to publish in an alternative language and are not able to do so.

Applicant Name: ChampionX LLC

Site or Facility Name: ChampionX Freeport

Water Quality Permit Number: WQ0001806000

Regulated Entity Number: RN 102185717 Customer Number: CN 602898751

ALTERNATIVE LANGUAGE EXEMPTION

I certify that I have conducted a diligent search for a newspaper or publication of general circulation in both the municipality and county in which the facility is located or proposed to be located and was unable to publish the notice in the required alternative language because:

- ☒ A newspaper or publication could not be found in any of the alternative languages in which notice is required.
- ☐ The publishers of the newspapers listed below refused to publish the notice as requested, and another newspaper or publication in the same language and of general circulation could not be found in the municipality or county in which the facility is located or proposed to be located.

Newspaper Name:

Language:

Applicant or Applicant Representative Signature: _____

Title: _____ Date: _____

ATTACHMENTS

ATTACHMENT 1

AR1.0 – 2c
Core Data Form



TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)		
<input type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input checked="" type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input checked="" type="checkbox"/> Other	
2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN 602898751		RN 102185717

SECTION II: Customer Information

4. General Customer Information		5. Effective Date for Customer Information Updates (mm/dd/yyyy)	
<input type="checkbox"/> New Customer		<input checked="" type="checkbox"/> Update to Customer Information	
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)		<input type="checkbox"/> Change in Regulated Entity Ownership	
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).			
6. Customer Legal Name (If an individual, print last name first: eg: Doe, John)		If new Customer, enter previous Customer below:	
ChampionX LLC			
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
943806	3000018355	361520480	
11. Type of Customer:	<input checked="" type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Other:	
12. Number of Employees		13. Independently Owned and Operated?	
<input type="checkbox"/> 0-20 <input checked="" type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
14. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following:			
<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Owner & Operator			
<input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:			
15. Mailing Address:	2322 County Road 229		
City	Freeport	State	TX
ZIP	77541	ZIP + 4	
16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable)	
18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)	
(979) 239-5800		(979) 233-6767	

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If 'New Regulated Entity' is selected below this form should be accompanied by a permit application)	
<input type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input checked="" type="checkbox"/> Update to Regulated Entity Information	
The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC.)	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
ChampionX Freeport	

23. Street Address of the Regulated Entity: (No PO Boxes)	2322 County Road 229						
	City	Freeport	State	TX	ZIP	77541	ZIP + 4
24. County	Brazoria						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:							
26. Nearest City				State		Nearest ZIP Code	
27. Latitude (N) In Decimal:			28. Longitude (W) In Decimal:				
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		
29. Primary SIC Code (4 digits)		30. Secondary SIC Code (4 digits)		31. Primary NAICS Code (5 or 6 digits)		32. Secondary NAICS Code (5 or 6 digits)	
2899				325199			
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)							
Industrial Organic Chemicals							
34. Mailing Address:							
		City	Freeport	State	TX	ZIP	77542
						ZIP + 4	
35. E-Mail Address:							
36. Telephone Number		37. Extension or Code			38. Fax Number (if applicable)		
(979) 239-5800					(979) 233-6767		

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

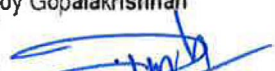
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input type="checkbox"/> Edwards Aquifer	<input checked="" type="checkbox"/> Emissions Inventory Air	<input checked="" type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input checked="" type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input checked="" type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

SECTION IV: Preparer Information

40. Name:				41. Title:			
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address				
() -		() -					

SECTION V: Authorized Signature

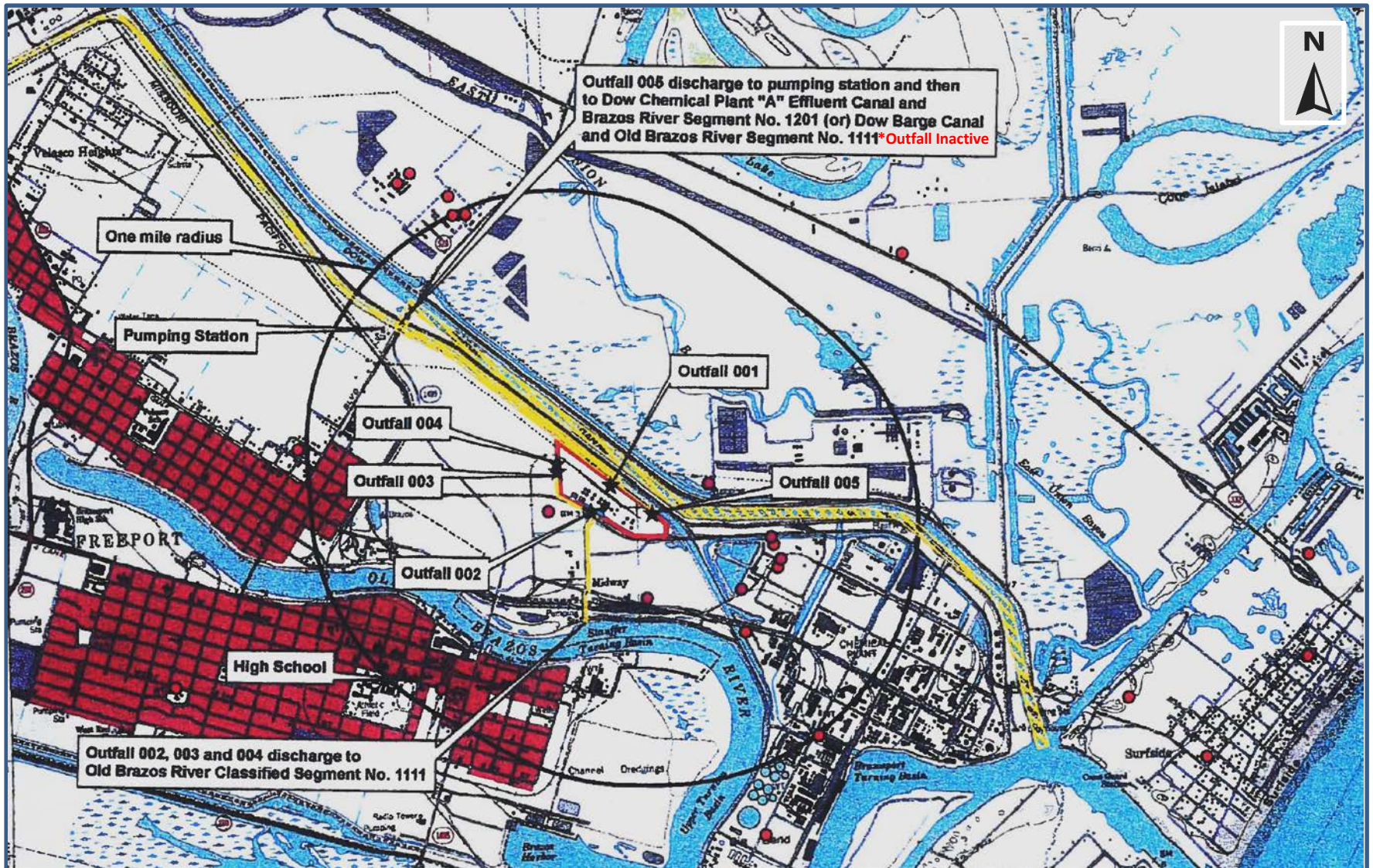
46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	ChampionX Freeport	Job Title:	Plant Manager
Name(In Print):	Jijoy Gopalakrishnan	Phone:	(979) 239-5811
Signature:		Date:	03/15/2024









ATTACHMENT 2

MAPS

AR1.0 – 9b
USGS Topographic
Quadrangle Map



LEGEND

- | | | | |
|---|------------------------------|---|---------------------------|
|  | Champion X Facility Boundary |  | One Mile Radius |
|  | Treatment Plant Boundary |  | Outfall Location |
|  | Discharge Route |  | Monitoring Wells |
|  | Ponds |  | Public Water Supply Wells |

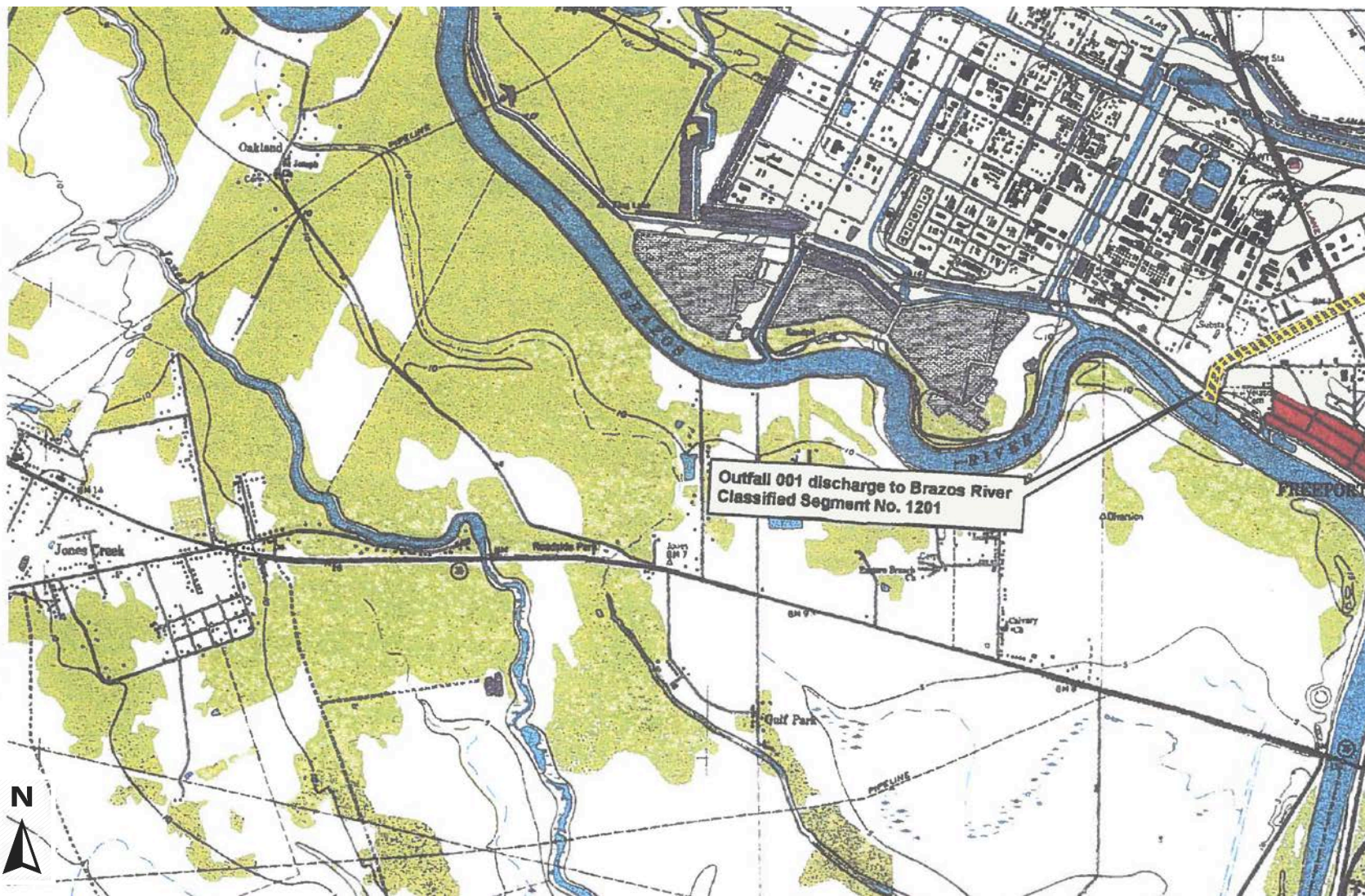
Note: Outfall 005 is now Inactive

CHAMPIONX

ChampionX Freeport
TPDES Permit No. WQ0001806000

Scale: 1:24000
Attachment SPIF Map

Freeport Quadrangle
7.5 Minute USGS
Topographical Map



LEGEND



Discharge Route

CHAMPIONX

ChampionX Freeport

TPDES Permit No. WQ0001806000

Scale 1:24000

Attachment 2

Jones Creek Quadrangle
7.5 Minute USGS
Topographical Map

ATTACHMENT 3

AR1.0 – 9g
Discharge Information

Attachment 3
Relating to question - AR 1.0 – 9g
Discharge Information

9g. Outfall Latitude & Longitude:

Outfall	Latitude	Longitude
001	28° 57' 35.26"	95° 20' 9.48"
002	28° 57' 30.46"	95° 20' 12.9"
101	28° 57' 35.26"	95° 20' 9.48"
201	28° 57' 34.4"	95° 20' 9.76"
301	28° 57' 34.54"	95° 20' 9.95"
003	28° 57' 38.27"	95° 20' 19.32"
004	28° 57' 37.21"	95° 20' 19.29"
005	28° 57' 27.99"	95° 19' 59.31"

ATTACHMENT 4

TR1.0 – 1c

List of Raw Materials,
Intermediates and Products

Attachment 4

Relating to question TR 1.0-1c

List of Raw Materials, Intermediates and products

2023 CHEMICAL NAME	CAS NUMBER
(2-Ethylhexyl)(hydrogenated tallowalkyl) methylamine	Unknown
1,2,4-Trimethylbenzene	95-63-6
Diethylenetriamine-PO-Polymer	29380-50-5
Aziridine-ethylenediamine polymer	25987-06-8
Propoxylated Ethylenediamine	25214-63-5
1-(2-Hydroxyethyl)-2-Tall Oil-2-Imidazoline	61791-39-7
2,4-Toluene-Diisocyanate	584-84-9
2-Ethylhexanol	104-76-7
Reaction Product of EO - 4-Nonylphenol - HCHO Resin and EO - PO and Poly(Acrylic Acid)	185529-31-1
N-Methylpyrrolidone	872-50-4
PHENOL, 4,4'-(1-METHYLETHYLIDENE)BIS-, POLYMERWITH (CHLOROMETHYL)OXIRANE, METHYLOXIRANE AND OXIRANE	68123-18-2
4-Hydroxy-2,2,6,6-Tetramethylpiperidyl-1-Oxyl	2226-96-2
4-Nonylphenol - Formaldehyde Resin	31605-35-3
4-Tert-Butylphenol - 4-Nonylphenol - Formaldehyde Resin	67905-95-7
4-Tert-Butylphenol - Formaldehyde Resin	25085-50-1
Acetaldehyde	75-07-0
Acetic Acid	64-19-7
Alcohols, C10-16	67762-41-8
Ethoxylated C10-16 Alcohols	68002-97-1
ALCOHOLS, C16-18, DISTN. RESIDUES	68603-17-8
C9-C11 Alcohols (iso-)	68526-85-2
Alcohols, C9-11-iso-, C10-rich, ethoxylated propoxylated	154518-36-2
C12-C15 Alcohol	63393-82-8
Alcohols, C7-C9-Iso, C8-Rich	68526-83-0
C11-C14 Alcohols	68526-86-3
Heavy Straight-Run Naphtha	64741-41-9
AMINES, COCO ALKYLDMETHYL, N-OXIDES	61788-90-7
Mono-Coco Alkyl-Amine	61788-46-3
Coco Alkyldimethyl Amines	61788-93-0
Aminoethylethanolamine	111-41-1
Light Aromatic Naphtha	64742-95-6
Polyethylene Imine	9002-98-6
Modified polyethyleneimine	26658-46-8
Benzaldehyde	100-52-7
Benzene	71-43-2
Benzene (C14-C30) Alkylate	68855-24-3
Tert-Butyl Perbenzoate	614-45-9
C10-C16 Alkylbenzenesulfonic Acid	68584-22-5
Benzenesulfonic Acid, C15-30-Alkyl Derivatives, Sodium Salt	78330-12-8
Potassium Dodecylbenzenesulphonate	27177-77-1
Benzyl Chloride	27177-77-1
Benzyl-Dimethyl-Dodecyl-Ammonium Chloride	139-07-1
Benzyl-Dimethyl-Hexadecyl-Ammonium Chloride	122-18-9
Benzyl-Dimethyl-Tetradecyl-Ammonium Chloride	139-08-2
Betaines, C10-16-alkyl(2-hydroxy-3-sulfopropyl)dimethyl	72869-77-3
Bisphenol A diglycidyl ether-bisphenol A copolymer	25036-25-3
Branched 4-Nonylphenol	84852-15-3
2-Butoxyethanol	111-76-2
Butyl Acrylate	141-32-2
Butanol	71-32-2
C12-C14 Tert-Alkyl Primary Amine	68955-53-3
C(14-18) Alkyl Alcohols	67762-30-5
C9-13-Neo-Fatty Acids, Potassium Salts	92044-83-2
C9-C11 Alcohols	66455-17-2

Carbon Disulfide	75-15-0
Carbon Activated	7440-44-0
Castor Oil	8001-79-4
Cetyl Alcohol	36653-82-4
Cumene	98-82-8
Cyclic dimethylsiloxane tetramer	556-67-2
Dodecamethylcyclohexasiloxane	540-97-6
Decamethyl cyclopentasiloxane	541-02-6
Decane	124-18-5
Decyl alcohol	112-30-1
Di(2-Ethylhexyl) Sodium Sulfosuccinate	577-11-7
Diesel Fuel No. 2	68476-34-6
Diethanolamine	111-42-2
Diethylamine	109-89-7
Diethylenetriamine	111-40-0
Diethylene Glycol	111-46-6
Diethylene Glycol Monobutyl Ether	112-34-5
Diethylene Glycol Monoethyl Ether	111-90-0
Dimethylamine	124-40-3
Dinonylphenol	1323-65-5
DINONYLPHENOL-FORMALDEHYDE-NONYLPHENOL COPOLYMER	63494-86-0
Dipotassium Fluorescein	6417-85-2
Dipropylene Glycol	25265-71-8
Disodium Dodecyl-Oxybis(Benzenesulfonate)	28519-02-0
Disodium Oxybis(Dodecylbenzenesulfonate)	25167-32-2
Ditallow Alkyl Amines	68783-24-4
2,6-Di-tert-Butyl-4-Methylphenol	128-37-0
Lauryl Alcohol	112-53-8
Benzenesulfonic acid, dodecyl-, branched	68411-32-5
Dodecylbenzenesulphonic Acid	27176-87-0
Dodecylphenol	27193-86-8
Oxyalkylated alkyl alcohol	78330-23-1
EO-PO- C14-18 Alcohols	68154-98-3
Diethyl-Hydroxyl-Amine	3710-84-7
EDC - Ammonia Condensation Product	29320-38-5
Ethanol	64-17-5
Monoethanolamine Hydrochloride	2002-24-6
Ethoxylated 4-Nonylphenol	26027-38-3
Ethoxylated 4-Nonylphenol - Formaldehyde Resin	30846-35-6
EO - 4-Tert-Amylphenol - HCHO Resin	63428-93-3
EO - 4-Tert-Butylphenol - 4-Nonylphenol - HCHO Resin	68171-44-8
Ethoxylated Alcohol	66455-15-0
Ethoxylated C11 Alcohol	34398-01-1
Ethoxylated C12-C14 alcohol (7 moles EO)	68439-50-9
Ethoxylated Alcohol	68131-39-5
Ethoxylated Castor Oil	61791-12-6
Ethoxylated Di-sec-butylphenol	53964-94-6
Ethoxylated Nonylphenol	9016-45-9
EO - PO - 4-Nonylphenol - HCHO Resin	63428-92-2
EO - PO - 4-Tert-Butylphenol - 4-Nonylphenol - HCHO Resin	68188-99-8
Ethoxylated Propoxylated Glycerine	9082-00-2
Ethoxylated Tall Oil	61791-00-2
Ethoxylated Tallow Alkyl Amine	61791-26-2
Ethoxylated Tridecanol	24938-91-8
Ethoxylated Undecyl Alcohol	127036-24-2
Ethoxylated, Propoxylated Hexadecanol	9087-53-0
Ethoxylated, propoxylated nonylphenol, dinonylphenol formaldehyde resin	68133-21-1
Ethylbenzene	100-41-4
Ethylenediamine	107-15-3

Ethylene dichloride-ammonia polymer, reaction prod with carbon disulfide and sodium hydroxide	428833-03-8
Ethylene Glycol	107-21-1
Ethylene Oxide	75-21-8
Ethylene Oxide - Propylene Oxide Copolymer	'9003-11-6
Ethylene oxide-propylene oxide copolymer monodecyl ether	37251-67-5
Piperazine Bottoms	68910-05-4
C18 Unsaturated Fatty Acid Dimer	61788-89-4
Polyethylene Glycol Di(Tall Oil Acid Ester)	61791-01-3
Tall Oil Acid, Potassium Salt	61790-44-1
Formaldehyde	50-00-0
FORMALDEHYDE, POLYMER WITH 4-(1,1-DIMETHYLETHYL)PHENOL AND OXIRANE	30704-63-3
EO - PO - 4-Tert-Butylphenol - HCHO Resin	30704-64-4
Oxyalkylate	68140-83-0
NONYLPHENOL-FORMALDEHYDE COPOLYMER	9040-65-7
Formaldehyde, polymers with branched 4-nonylphenol, ethylene oxide and propylene oxide	153795-76-7
Gas oils, petroleum, light vacuum	64741-58-8
Glycerine	56-81-5
Heavy Catalytic Reformed Naphtha	64741-68-0
Heavy Aromatic Naphtha	64742-94-5
Hexahydro-1,3,5-Trimethyl-S-Triazine	108-74-7
Hexahydro-1,3,5-Tris(2-Hydroxyethyl)-S-Triazine	'4719-04-4
Hexanol, Branched and Linear	68526-79-4
Hexyl alcohol	111-27-3
Olefin-Rich C12-C30 Hydrocarbon	68911-05-7
Hydrochloric Acid	7647-01-0
Hydrogen Peroxide	7722-84-1
Hydrotreated Heavy Naphtha	64742-48-9
Petroleum distillates, hydrotreated light	64742-47-8
Isobutanol	78-83-1
Isopropyl alcohol	67-63-0
Kerosene	8008-20-6
Light Aromatic Naphtha	64742-95-6
Magnesium Chloride	7786-30-3
1,3,5-Trimethylbenzene	108-67-8
Methanesulfonic Acid	75-75-2
Sodium methoxide	124-41-4
Methoxypropylamine	5332-73-0
Methyl alcohol	67-56-1
Methyl Isobutyl Ketone	108-10-1
Monoethanolamine	141-43-5
Monomethylamine	74-89-5
Myristyl Alcohol	112-72-1
Naphthalene	91-20-3
N-Coco Alkyl-1,3-Propylenediamine	61791-63-7
Nonene, hydroformylation products, high boiling	68526-90-9
Octyl alcohol	111-87-5
Ethoxylated Octylphenol	9036-19-5
Olefin-Rich C14-C30 Hydrocarbon	68514-35-2
Oleic Acid	112-80-1
Monooleylamine	112-90-3
Oxalic Acid, Dihydrate	6153-56-6
Paraformaldehyde	30525-89-4
Petroleum	2228-84-0
Phenol	108-95-2
4-Sec-Butylphenol	99-71-8
Di-sec-butylphenol	31291-60-8
Phenothiazine	92-84-2
Phosphoric Acid	7664-38-2
Ethoxylated branched C11-14, C13-rich alcohols, phosphates	78330-24-2

Phosphorous Acid	10294-56-1
FATTY ACIDS, C18-UNSATD., DIMERS, POLYMERS WITH DIETHYLENE GLYCOL	68552-01-2
Poly(Dimethylsiloxane)	63148-63-9
Dodecylphenol, ethoxylated	9014-92-0
Ethoxylated Isodecyl Alcohol	61827-42-7
polyethyleneglycol tridecyl ether phosphate	`2610-03-3
Polyethylene Glycol	25322-68-3
Polypropylene Glycol	25322-69-4
Potassium Hydroxide	1310-58-3
Potassium Acetate	127-08-2
DDBSA Branched, Potassium Salt	68953-99-1
Potassium Sulphate	7778-80-5
Terpene Hydrocarbons, By-Product	68956-56-9
Tripropylene Glycol	24800-44-0
Propylene Glycol	57-55-6
Propylene Oxide	75-56-9
Quaternary ammonium compound, (2-ethylhexyl)(hydrogenated tallowalkyl) dimethyl, me sulfates	308074-31-9
Reaction Product of EO - PO and EPON	68036-95-3
Reaction Product of EO - PO and TDI	9052-50-0
Reaction Product of EO - PO - Glycerine and TDI	57516-88-8
Oxyalkylated epoxide polymer	36484-54-5
Reaction Product of Silica and Poly(Dimethylsiloxane)	67762-90-7
Distillates, (Petroleum), hydrotreated heavy naphthenic	64742-52-5
Silica	7631-86-9
Sodium Hydroxide	1310-73-2
Sodium carbonate	497-19-8
Sodium Chloride	7647-14-5
Sodium Sulfate	7757-82-6
Sodium Sulphide	1313-82-2
Ethoxylated Sorbitan Monolaurate	9005-64-5
Sorbitol	50-70-4
Stearyl Alcohol	112-92-5
Nonylphenol	25154-52-3
4-Tert-Butylphenol	98-54-4
Sulfamic Acid	5329-14-6
Sulfuric Acid	7664-93-9
Tall Oil	8002-26-4
Tall Oil Fatty Acid	61790-12-3
N-Tallow Alkyl-1,3-Propylenediamine	61791-55-7
Mono-Tallow Alkyl-Amine	61790-33-8
4-Tert-Amylphenol	80-46-6
Tetrapropylene-Benzene	25265-78-5
Toluene	108-88-3
2,6-Toluene-Diisocyanate	91-08-7
Triethanolamine	102-71-6
Triethanolamine Tri(Phosphate Ester), Sodium Salt	68171-29-9
Triethylenetetramine	112-24-3
Trimethylamine	75-50-3
EO-PO Copolymer, Ether with Trimethylolpropane	52624-57-4
Trisodium phosphate	7601-54-9
Undecanol, branched and linear	128973-77-3
Undecanol	112-45-5
Fatty acids, C9-13-neo-	68938-07-8
Water	7732-18-5
Xylene	1330-20-7
2-Hydroxyethyliminobis(methylene phosphoric acid), Ethanolamine Salt	unknown
Modified polyethyleneimine	unknown
Proprietary component, Dow Chemical , Accent 1130	unknown
Amines, C12-14-Tert-Alkyl, Phosphates (1:1)	unknown

Didodecylphenol	25402-47-7
Diethylene Pentamine Acrylic Acid Copolymer	unknown
Ditertamylphenol	120-95-6
Ditertamylphenol	25231-47-4
Epon Resin (Phenol, 4,4'-(1-Methylethylidene)Bis-,Polymer With (Chloromethyl)Oxirane)	25088-38-6
Ethanaminium, N,N,N-Trimethyl-2-[(1-Oxo-2-Propenyl)Oxy]-, Chloride, Polymer With 2-Propenamide	69418-26-4
Ethoxylated Nonylphenol-Benzaldehyde Polymer	unknown
Heavy Aromatic Distillates	67891-79-6
Hexahydro-1,3,5-Tris(2-Hydroxyethyl)-S-Triazine	1029-71-3
Hydrotreated Middle Distillate	64742-46-7
Nonylphenol-Benzaldehyde Polymer	unknown
Oxirane, Methyl-, Polymer with Oxirane	2594-62-8
Propoxylated 4-Tert-Butylphenol - 4-Nonylphenol - Formaldehyde Resin	unknown
Proprietary Hydroxyethylated Polyethyleneimine	unknown
p-toluenesulfonic acid monohydrate	6192-52-5
Sodium Salt of Phosphonomethylated Diamine	unknown
Sorbitan, Monostearate, Polyoxyethylene Derivs	9005-67-8
Substituted Ethoxyethylamine Phosphate, Ethanolamine Salt	unknown
Thiosulfuric Acid (H2S2O3), Diammonium Salt	7783-18-8
Trimethylbenzene	25551-13-7
Utylphenols	60083-44-5

ATTACHMENT 5

TR1.0 – 1d

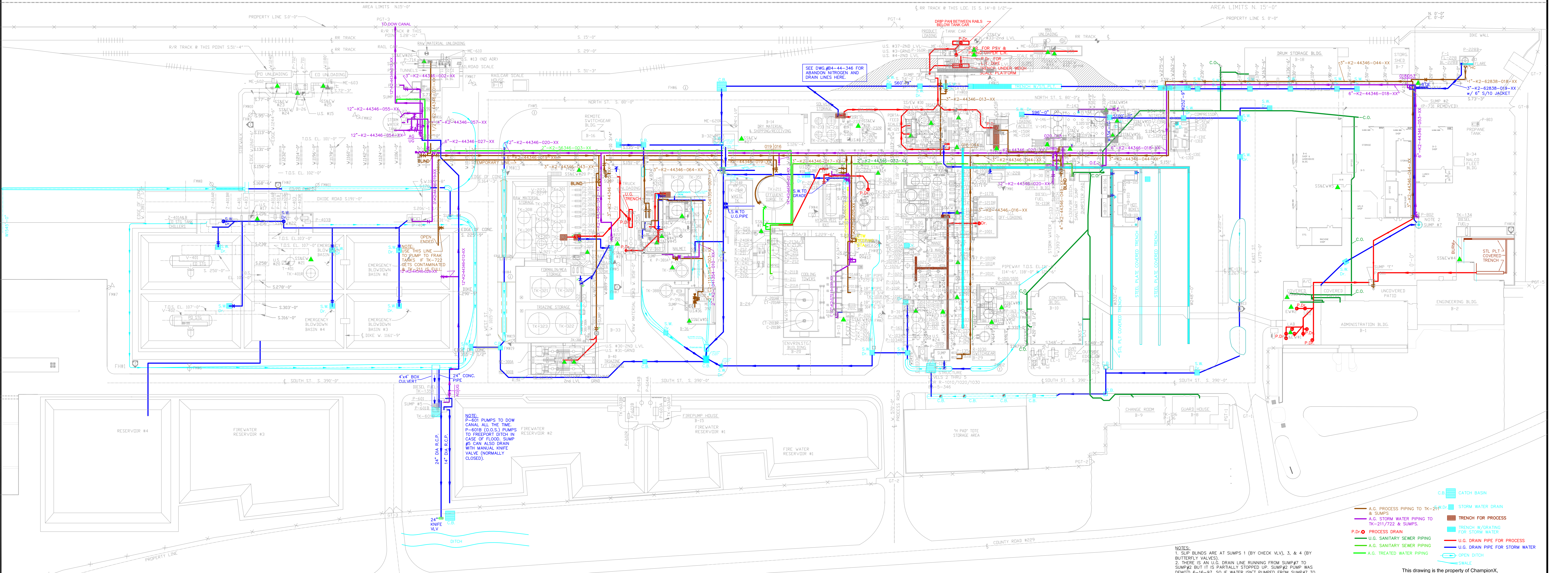
Maps of Production, Maintenance,
Materials Handling and Waste Disposal Areas

represented on

E.H.&S. Freeport Facility Map

Drawing B0-7-346


Drawing: B0-25

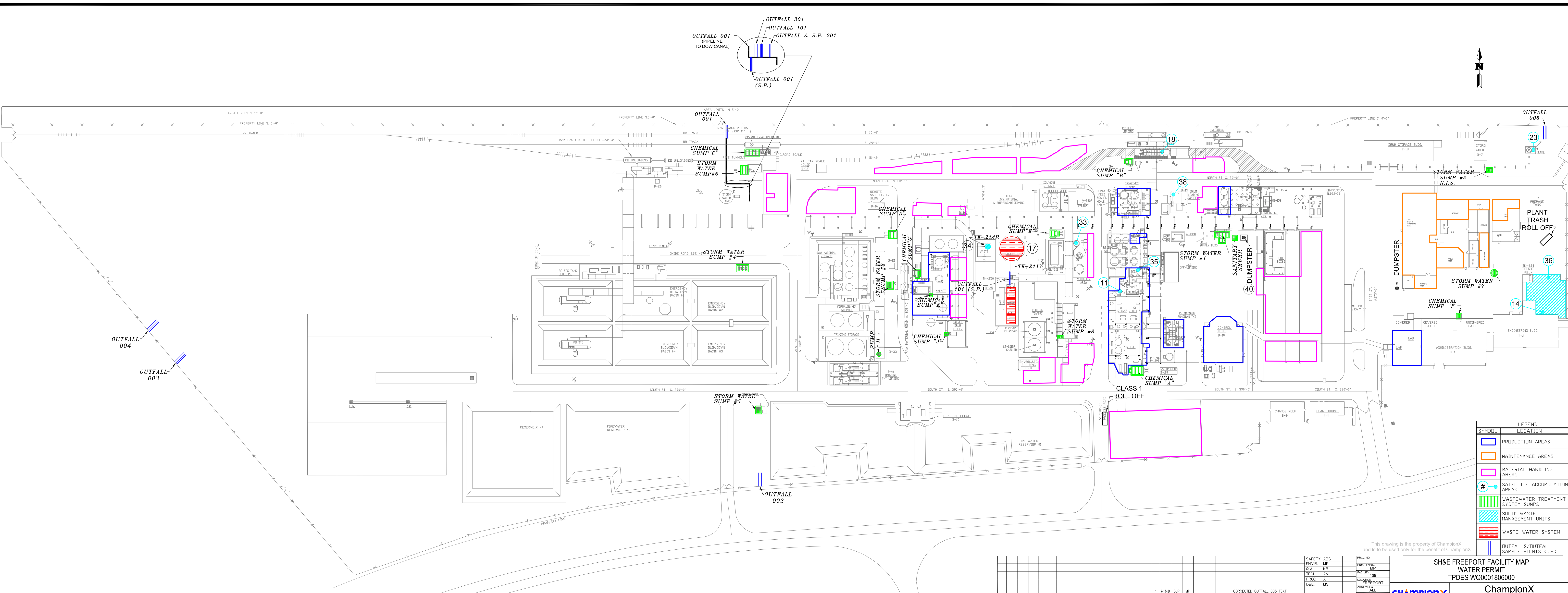


NOTES:
1. SUMP BUNDS ARE AT SUMPS 1 (BY CHECK VLV), 3, & 4 (BY BUTTERFLY VALVES).
2. THERE IS AN U.G. DRAIN LINE RUNNING FROM SUMP#7 TO SUMP#2 BUT IT IS PARTIALLY STOPPED UP. SUMP#2 PUMP WAS DEMO'D 6-16-97, SO IF WATER ISN'T PUMPED FROM SUMP#7 TO TK-722, IT WILL NOT FLOW THRU THE U.G. DRAIN LINE.

This drawing is the property of ChampionX, and is to be used only for the benefit of ChampionX.

B0-7-346
LEFT HALF

			10	12-17-16	SLR	AJ/BMD	M1354	NALMET EXPANSION. ADD SUMPS J & K.	15	7-19-20	SLR	TF	INSTALL STORM WATER LINE FROM LINE FROM SUMP 7 TO SUMP 1 W/ 2 GATE VALVES.	SAFETY	ABS	FROM: MP	346	<div>S. P. L. E. S. LOT PLAN STORM WATER DRAINS & COLLECTION</div> <div>ChampionX</div> <div>Plant 105 2322 CR 229 Freeport, Texas 77541</div>
			9	5-20-15	SLR	AS	M1245	ADDED SWALE IN TK-322/323 DIKE FOR DRAINAGE	14	7-19-20	SLR	MP	FIELD VERIFICATION OF FIELD U.G. LINES AND CIVIL & PIPING DWGS FOR SUMP#7 & #2	ENVIR.	MP	184	ANDY SLATER	
B0-7A-346	REF.DWGS FOR DETAILS, ELEVATIONS & NOTES.		8	2-5-16	SLR	BMD	M1315	OXY PKG TANKS PROJECT V-145/146	11	7-19-20	SLR	MP	UPDATE PLOT PLAN AND ADD MISSING CATCH BASIN IN COMPRESSORS CURBED AREA.	TECH.	AH	105	LOCUST CREEKPORT	
B2-169-999	CONTAINMENT AREAS DRAINAGE DETAILS SHT 3		7	11-23-15	SLR	JED	M131-60	SUMP G CONTAINMENT PUMP	13	2-18-16	SLR	MP	ADDED U.G. DRAIN LINE BY NALMET TO REPLACE DITCH & NEW CATCH BASINS.					
B2-168-999	CONTAINMENT AREAS DRAINAGE DETAILS SHT 2		6	7-1-14	SLR	RWC	M1245	TRIAZINE PHASE 2. TK-322 & TK-323.	12	1-15-16	SLR	AJ	M1354	CREATE CONTAINMENT FOR & MOVE HOT BOXES				
B2-167-999	CONTAINMENT AREAS DRAINAGE DETAILS SHT 1		5	9-15-12	SLR	BMD	M1112	V-117 TRIAZINES PROJ. ADD TK-320 & TK-321	11	2-18-16	SLR	SA						
DRAWING NO.		DESCRIPTION	NO.	DATE	DRN BY	ENGR	PROJECT NO.	DESCRIPTION	NO.	DATE	DRN BY	ENGR	PROJECT NO.	DESCRIPTION	NAME	DATE	SCALE	
REFERENCE DRAWINGS			REVISIONS											APPROVALS		DRAWING DIRECTORY		
																G:\ACADIB0		
																S02		
																B0-7-346		
																REV.		



LEGEND	
SYMBOL	LOCATION
	PRODUCTION AREAS
	MAINTENANCE AREAS
	MATERIAL HANDLING AREAS
	SATELLITE ACCUMULATION AREAS
	WASTEWATER TREATMENT SYSTEM SUMPS
	SOLID WASTE MANAGEMENT UNITS
	WASTE WATER SYSTEM
	OUTFALLS/OUTFALL SAMPLE POINTS (S.P.)

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SAFETY	ABS	PROJ. NO.	
ENVR.	MP	PROJ. ENGR.	MP
Q.A.	KB	FACILITY	105
TECH.	AM	LOCATION	FREEPORT
PROD.	AH	ZONE/AREA	ALL
I.&E.	MS	DRAWING	SLR

NO.	DATE	DRN BY	ENGR.	PROJECT NO.	DESCRIPTION
1	5-13-24	SLR	MP		CORRECTED OUTFALL 005 TEXT.
0	1-31-24	SLR	MP		CREATED DRAWING IN CAD.

NAME	DATE	DATE	DATE
		1-31-24	

APPROVALS	SCALE	DRAWING DIRECTORY
	0'-288"=20'-0"	G:\ACAD\B0

SH&E FREEPORT FACILITY MAP
WATER PERMIT
TPDES WQ0001806000

ChampionX
Plant 105 2322 CR 229 Freeport, Texas 77541

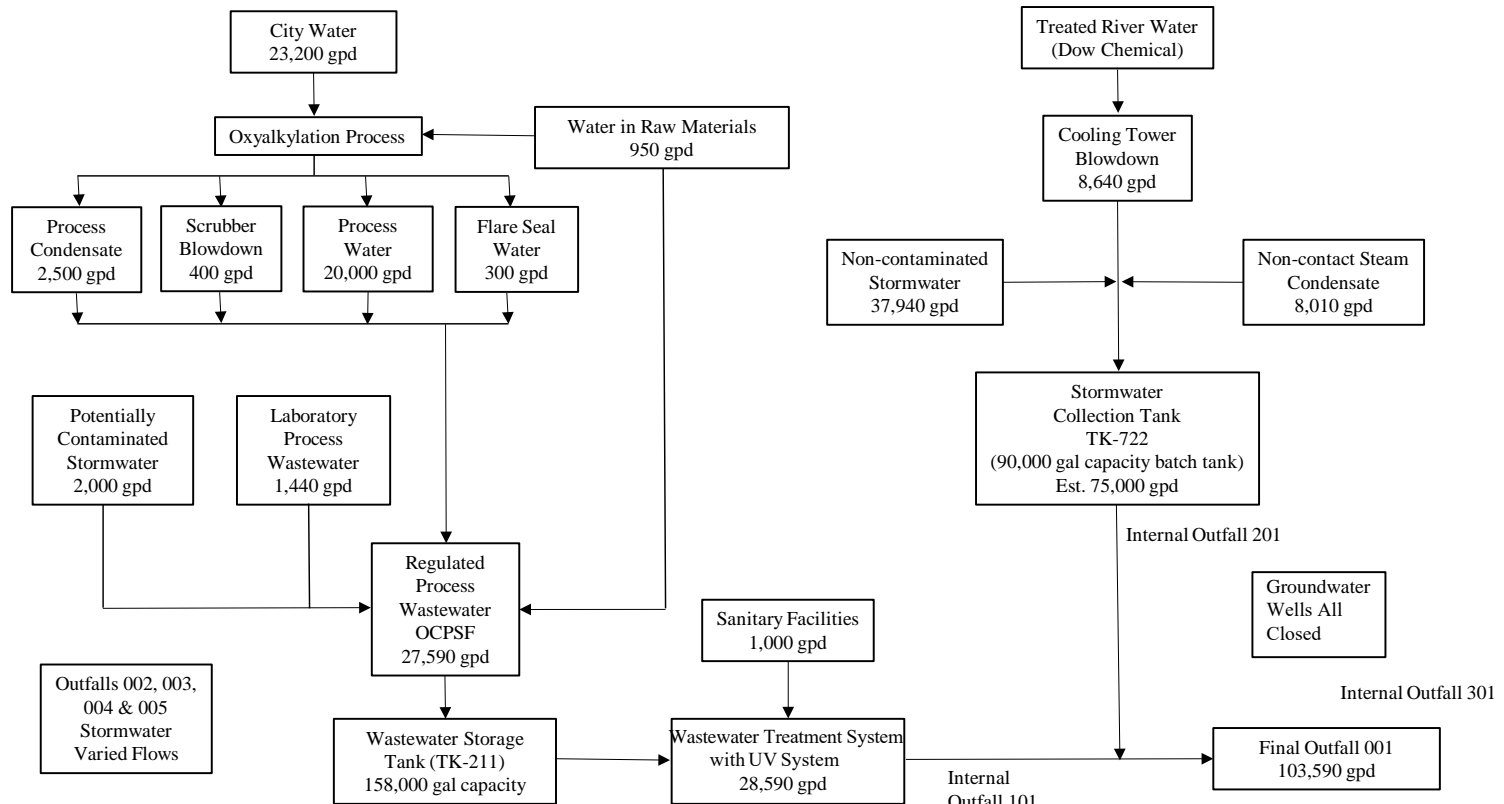
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ATTACHMENT 6

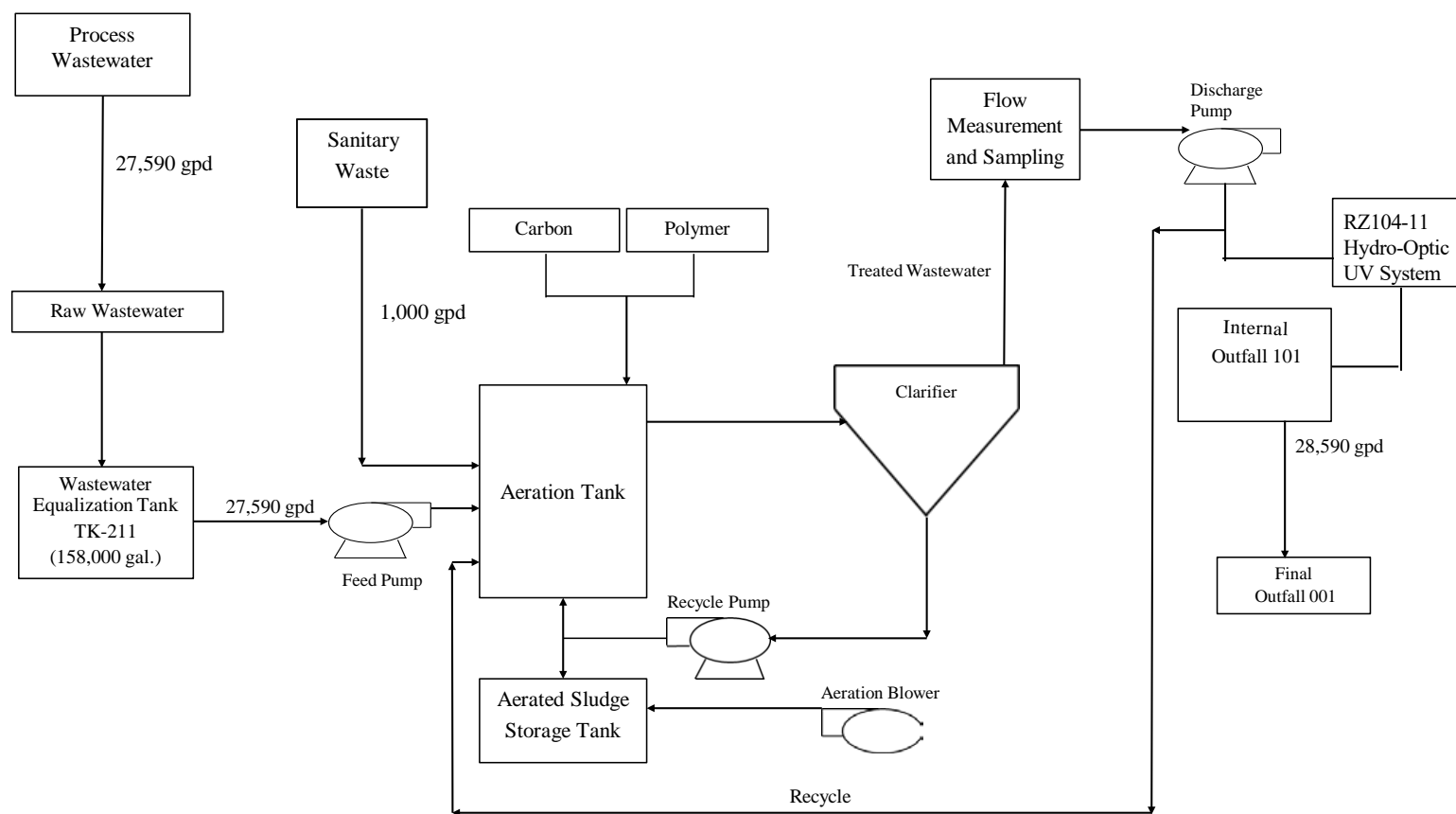
TR1.0 – 2b

Wastewater Flow Schematic and
Water Flow Balance

Attachment 6
Relating to question – TR1.0-2b
Water Flow Balance



Attachment 6
Relating to question – TR1.0-2b
Water Flow Schematic Diagram



ATTACHMENT 7

TR1.0 – 4

Additional Outfall

Wastestream Contributions

Attachment 7
TR1.0 – 4
Additional Outfall
Wastestream Contributions

Outfall No.: 201

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Non-Contaminated Stormwater	.2904	94
Non-Process Cooling Tower Blowdown	.00864	3
Non-Contact Steam Condensate	.00801	3

Outfall No.: 301

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Recovered groundwater	0.00	0
Note: This outfall is inactive		

Outfall No.: 003

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Stormwater (normally no flow)	Variable	100

Outfall No.: 004

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Stormwater (normally no flow)	Variable	100
Note: This outfall is inactive		

Outfall No.: 005

Contributing Wastestreams	Volume (MGD)	% of Total Flow
Stormwater (normally no flow)	Variable	100

ATTACHMENT 8

TR1.0 – 5c
SDS

SAFETY DATA SHEET

STABREX™ ST70

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : STABREX™ ST70

Other means of identification : Not applicable.

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630) 305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC


Issuing date : 09/11/2019

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4
Acute toxicity (Inhalation) : Category 4
Skin corrosion : Category 1
Serious eye damage : Category 1

GHS Label element

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : Harmful if swallowed or if inhaled
Causes severe skin burns and eye damage.

Precautionary Statements : **Prevention:**
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

SAFETY DATA SHEET

STABREX™ ST70

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical Name	CAS-No.	Concentration: (%)
Sodium Bromide	7647-15-6	9.23
Sodium Hypochlorite	7681-52-9	6.36
Sodium Chloride	7647-14-5	1 - 5
Sodium Hydroxide	1310-73-2	1 - 5

Section: 4. FIRST AID MEASURES

- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
- In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention.
- Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
- Notes to physician : Treat symptomatically.
- Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : None known.
- Specific hazards during firefighting : Not flammable or combustible.
- Special protective equipment for firefighters : Use personal protective equipment.
- Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

SAFETY DATA SHEET

STABREX™ ST70

Section: 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : This product is toxic to fish and other aquatic organisms. It is not to be used in circumstances that would cause or allow it to enter lakes, streams, ponds, estuaries, oceans or other waters in contravention of federal or provincial regulatory requirements. DO NOT discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. The requirements of applicable laws should be determined before using the product.
- Methods and materials for containment and cleaning up : Clean-up methods - small spillage Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Clean-up methods - large spillage For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

Section: 7. HANDLING AND STORAGE

- Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation. Mixing this product with acid or ammonia releases chlorine gas.
- Conditions for safe storage : Do not store near acids. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
- Suitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Polyethylene, Polypropylene, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use., HDPE (high density polyethylene), Neoprene, PVC, Polyurethane, Chlorosulfonated polyethylene rubber, Fluoroelastomer
- Unsuitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Brass, Buna-N, EPDM, Stainless Steel 316L, Stainless Steel 304, 100% phenolic resin liner, Epoxy phenolic resin, Mild steel

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Sodium Hypochlorite	7681-52-9	STEL	2 mg/m3	AIHA WEEL

SAFETY DATA SHEET

STABREX™ ST70

Sodium Hydroxide	1310-73-2	Ceiling	2 mg/m3	ACGIH
		Ceiling	2 mg/m3	NIOSH REL
		TWA	2 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles
Face-shield

Hand protection : Wear the following personal protective equipment:
butyl-rubber
Neoprene gloves
Nitrile rubber
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Combined particulates and inorganic gas/vapour type

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : light yellow

Odour : odourless

Flash point : Not applicable.

pH : 13.0

Odour Threshold : no data available

Melting point/freezing point : -8.2 °C, ASTM D-1177

Initial boiling point and boiling range : no data available

Evaporation rate : no data available

Flammability (solid, gas) : no data available

Upper explosion limit : no data available

Lower explosion limit : no data available

Vapour pressure : 7.7 mm Hg, (25 °C), ASTM D 2879-86,
27 mm Hg, (46 °C), ASTM D 2879-86,

SAFETY DATA SHEET

STABREX™ ST70

Relative vapour density	: no data available
Relative density	: 1.305 - 1.380, (25 °C), ASTM D-1298
Density	: 11.0 - 11.3 lb/gal
Water solubility	: completely soluble
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: 7 mPa.s
Viscosity, kinematic	: no data available
Molecular weight	: no data available
VOC	: 0 %, EPA Method 24

Section: 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Mixing this product with acid or ammonia releases chlorine gas.
Conditions to avoid	: Avoid extremes of temperature. Heat and light which can accelerate decomposition. Freezing temperatures.
Incompatible materials	: None known.

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	: Causes serious eye damage.
Skin	: Causes severe skin burns.
Ingestion	: Harmful if swallowed. Causes digestive tract burns.
Inhalation	: Harmful if inhaled. May cause nose, throat, and lung irritation.
Chronic Exposure	: Health injuries are not known or expected under normal use.

Experience with human exposure

SAFETY DATA SHEET

STABREX™ ST70

Eye contact : Redness, Pain, Corrosion
Skin contact : Redness, Pain, Corrosion
Ingestion : Corrosion, Abdominal pain
Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : LD50 rat: 1,500 mg/kg
Acute inhalation toxicity : no data available
Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Skin corrosion/irritation : Species: rabbit
Result: 7.9
Method: Draize Test
Test substance: Similar Product
Serious eye damage/eye irritation : Species: rabbit
Result: Corrosive
Method: Draize Test
Test substance: Similar Product
Respiratory or skin sensitization : no data available
Carcinogenicity : no data available
Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available
Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : Toxic to aquatic life.

Product

Toxicity to fish : LC50 Oncorhynchus mykiss (rainbow trout): 4.5 mg/l
Exposure time: 96 hrs
Test substance: Product
LC50 Cyprinodon variegatus (sheepshead minnow): 16 mg/l
Exposure time: 96 hrs
Test substance: Product

SAFETY DATA SHEET

STABREX™ ST70

LC50 Pimephales promelas (fathead minnow): 8.3 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Oncorhynchus mykiss (rainbow trout): 1.3 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Cyprinodon variegatus (sheepshead minnow): 8 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Pimephales promelas (fathead minnow): 3.6 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Pimephales promelas (fathead minnow): 7.1 mg/l
Exposure time: 48 hrs
Test substance: Product

NOEC Pimephales promelas (fathead minnow): 5.0 mg/l
Exposure time: 48 hrs
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : LC50 Daphnia magna (Water flea): 4.3 mg/l
Exposure time: 48 hrs
Test substance: Product

LC50 Mysid Shrimp (Mysidopsis bahia): 27 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Ceriodaphnia dubia: 1.6 mg/l
Exposure time: 48 hrs
Test substance: Product

EC50 Daphnia magna (Water flea): 4.2 mg/l
Exposure time: 48 hrs
Test substance: Product

NOEC Daphnia magna (Water flea): 2.2 mg/l
Exposure time: 48 hrs
Test substance: Product

NOEC Mysid Shrimp (Mysidopsis bahia): 13 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Ceriodaphnia dubia: 0.63 mg/l
Exposure time: 48 hrs
Test substance: Product

Toxicity to algae : LC50 Green Algae (Pseudokirchneriella subcapitata, previously Selenastrum capricornutum): 3.66 mg/l
Exposure time: 72 hrs

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Test substance: Product

NOEC Green Algae (*Pseudokirchneriella subcapitata*,
previously *Selenastrum capricornutum*): 2.5 mg/l

Exposure time: 72 hrs

Test substance: Product

Toxicity to fish (Chronic toxicity) : EC25 / IC25: 3.34 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

LOEC: 5 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

NOEC: 2.5 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC25 / IC25: 15.6 mg/l
Species: *Ceriodaphnia dubia*
Test substance: Product
Test Type: 3 Brood

NOEC: 2.5 mg/l
Species: *Ceriodaphnia dubia*
Test substance: Product
Test Type: 3 Brood

LOEC: 5.0 mg/l
Species: *Ceriodaphnia dubia*
Test substance: Product
Test Type: 3 Brood

NOEC: 20.0 mg/l
Species: *Ceriodaphnia dubia*
Test substance: Product
Test Type: 3 Brood

LOEC: 40.0 mg/l
Species: *Ceriodaphnia dubia*
Test substance: Product
Test Type: 3 Brood

Persistence and degradability

Chemical Oxygen Demand (COD): 89,900 mg/l

Biochemical Oxygen Demand (BOD): This material is an oxidizing biocide and is not expected to persist in the environment.

SAFETY DATA SHEET

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Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	: <5%
Water	: 30 - 50%
Soil	: 30 - 50%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: : D002

Disposal methods : The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name	: SODIUM HYDROXIDE SOLUTION
Technical name(s)	:
UN/ID No.	: UN 1824
Transport hazard class(es)	: 8
Packing group	: II
Reportable Quantity (per	: 15,625 lbs

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STABREX™ ST70

package)
RQ Component : Sodium Hydroxide

Air transport (IATA)

Proper shipping name : SODIUM HYDROXIDE SOLUTION
Technical name(s) :
UN/ID No. : UN 1824
Transport hazard class(es) : 8
Packing group : II
Reportable Quantity (per package) : 15,625 lbs
RQ Component : Sodium Hydroxide

Sea transport (IMDG/IMO)

Proper shipping name : SODIUM HYDROXIDE SOLUTION
Technical name(s) :
UN/ID No. : UN 1824
Transport hazard class(es) : 8
Packing group : II

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPA Reg. No. : 1706-179

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Hydroxide	1310-73-2	1000	15625

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65

SAFETY DATA SHEET

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This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

Canadian Domestic Substances List (DSL)

Substances regulated under the Pest Control Products Act are exempt from CEPA New Substance Notification requirements.

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

Taiwan Chemical Substance Inventory

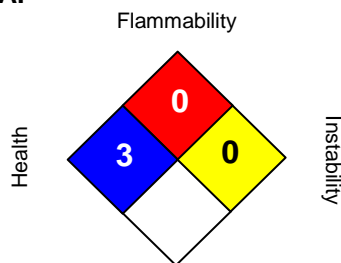
All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

SAFETY DATA SHEET

STABREX™ ST70

NFPA:



HMIS III:

HEALTH	3
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 09/11/2019
Version Number : 1.6
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

SAFETY DATA SHEET

3D TRASAR™ 3DT231

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 3D TRASAR™ 3DT231

Other means of identification : Not applicable.

Recommended use : COOLING WATER TREATMENT

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630) 305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 03/29/2021

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion : Category 1
Serious eye damage : Category 1

GHS Label element

Hazard pictograms :



Signal Word : Danger

Hazard Statements : Causes severe skin burns and eye damage.

Precautionary Statements : **Prevention:**
Wash skin thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Response:
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated clothing before reuse.

Storage:
Store locked up. Protect product from freezing.

Disposal:

SAFETY DATA SHEET

3D TRASAR™ 3DT231

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration: (%)
Phosphoric Acid	7664-38-2	1 - 5
Sulfuric Acid	7664-93-9	1 - 5
Substituted aromatic amine	Proprietary	1 - 5

Section: 4. FIRST AID MEASURES

In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
In case of skin contact	: Wash off immediately with plenty of water for at least 15 minutes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
If swallowed	: Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
If inhaled	: Remove to fresh air. Treat symptomatically. Get medical attention if symptoms occur.
Protection of first-aiders	: In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	: Treat symptomatically.
Most important symptoms and effects, both acute and delayed	: See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: None known.
Specific hazards during firefighting	: Not flammable or combustible.
Hazardous combustion products	: Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
Special protective equipment for firefighters	: Use personal protective equipment.

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3D TRASAR™ 3DT231

Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation. Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Conditions for safe storage : Keep away from strong bases. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Phosphoric Acid	7664-38-2	TWA	1 mg/m ³	ACGIH
		STEL	3 mg/m ³	ACGIH
		TWA	1 mg/m ³	NIOSH REL
		STEL	3 mg/m ³	NIOSH REL
		TWA	1 mg/m ³	OSHA Z1
Sulfuric Acid	7664-93-9	TWA (Thoracic particulate matter)	0.2 mg/m ³	ACGIH
		TWA	1 mg/m ³	NIOSH REL
		TWA	1 mg/m ³	OSHA Z1

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Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles
Face-shield

Hand protection : Wear the following personal protective equipment:
Standard glove type.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : clear

Odour : Organic

Flash point : Not applicable.

pH : 1.1

Odour Threshold : no data available

Melting point/freezing point : Freezing Point: -4.6 °C, ASTM D-1177

Initial boiling point and boiling range : no data available

Evaporation rate : no data available

Flammability (solid, gas) : Not applicable.

Upper explosion limit : no data available

Lower explosion limit : no data available

Vapour pressure : 9.60 hPa, (0 °C), ASTM D-2879,
30.7 hPa, (20 °C),
72 hPa, (37.8 °C),
180 hPa, (65.6 °C),

SAFETY DATA SHEET

3D TRASAR™ 3DT231

	706 hPa, (93.3 °C),
	1,010 hPa, (103.3 °C),
Relative vapour density	: no data available
Relative density	: 1.13, (15.5 °C),
Density	: 9.4 lb/gal
Water solubility	: no data available
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: 4.14 mPa.s (20 °C), Method: ASTM D-445
Viscosity, kinematic	: no data available
Molecular weight	: no data available
VOC	: no data available

Section: 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions to avoid	: Extremes of temperature
Incompatible materials	: Strong bases
Hazardous decomposition products	: In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	: Causes serious eye damage.
Skin	: Causes severe skin burns.
Ingestion	: Causes digestive tract burns.

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Inhalation : May cause nose, throat, and lung irritation.

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : Redness, Pain, Corrosion

Skin contact : Redness, Pain, Corrosion

Ingestion : Corrosion, Abdominal pain

Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 20.7 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : no data available

Skin corrosion/irritation : no data available

Serious eye damage/eye irritation : no data available

Respiratory or skin sensitization : no data available

Carcinogenicity

IARC **Group 1: Carcinogenic to humans**
Sulfuric Acid 7664-93-9

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Known to be human carcinogen
Sulfuric Acid 7664-93-9

Reproductive effects : no data available

Germ cell mutagenicity : no data available

Teratogenicity : no data available

STOT - single exposure : no data available

STOT - repeated exposure : no data available

Aspiration toxicity : no data available

Components

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Acute dermal toxicity : Phosphoric Acid
LD50 rabbit: > 2,000 mg/kg

Substituted aromatic amine
LD50 rabbit: > 10,000 mg/kg

Section: 12. ECOLOGICAL INFORMATION

Toxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Fathead Minnow: 2,387 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Fathead Minnow: 1,800 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Rainbow Trout: 758 mg/l
Exposure time: 96 h
Test substance: Product

NOEC Rainbow Trout: 500 mg/l
Exposure time: 96 h
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : LC50 Ceriodaphnia dubia: 2,208 mg/l
Exposure time: 48 hrs
Test substance: Product

LOEC Ceriodaphnia dubia: 1,800 mg/l
Exposure time: 48 hrs
Test substance: Product

Components

Toxicity to algae : Phosphoric Acid
EC50 Desmodesmus subspicatus (green algae): > 100 mg/l
Exposure time: 72 h

Substituted aromatic amine
EC50 algae: 15.4 mg/l
Exposure time: 72 h

Components

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Substituted aromatic amine
NOEC: 0.97 mg/l
Exposure time: 21 d

Persistence and degradability

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Total Organic Carbon (TOC) : 66,000 mg/l

Chemical Oxygen Demand (COD): 170,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	3,300 mg/l	

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	: <5%
Water	: 10 - 30%
Soil	: 70 - 90%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Disposal methods : Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

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Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID
UN/ID No. : UN 3264
Transport hazard class(es) : 8
Packing group : III
Reportable Quantity (per package) : 53,645 lbs
RQ Component : Sulfuric Acid

Air transport (IATA)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID
UN/ID No. : UN 3264
Transport hazard class(es) : 8
Packing group : III
Reportable Quantity (per package) : 53,645 lbs
RQ Component : Sulfuric Acid

Sea transport (IMDG/IMO)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Technical name(s) : PHOSPHORIC ACID, SULFURIC ACID
UN/ID No. : UN 3264
Transport hazard class(es) : 8
Packing group : III

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric Acid	7664-93-9	1000	53645

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric Acid	7664-93-9	1000	53645

SARA 311/312 Hazards : Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 302 : The following components are subject to reporting levels established by SARA Title III, Section 302:

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3D TRASAR™ 3DT231

Sulfuric Acid 7664-93-9

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Sulfuric Acid 7664-93-9 1 - 5 %

California Prop. 65

 **WARNING:** Cancer - www.P65Warnings.ca.gov

Sulfuric Acid 7664-93-9

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

United States TSCA Inventory

On or in compliance with the active portion of the TSCA inventory

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)

On the inventory, or in compliance with the inventory.

Japan. ENCS - Existing and New Chemical Substances Inventory

not determined

Korea. Korean Existing Chemicals Inventory (KECI)

On the inventory, or in compliance with the inventory.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

On the inventory, or in compliance with the inventory.

China Inventory of Existing Chemical Substances

On the inventory, or in compliance with the inventory.

Taiwan Chemical Substance Inventory

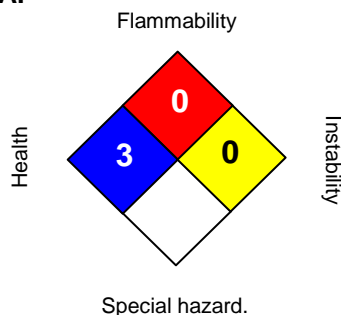
not determined

Section: 16. OTHER INFORMATION

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3D TRASAR™ 3DT231

NFPA:



HMIS III:

HEALTH	3
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 03/29/2021
Version Number : 1.6
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

Attachment 8
Relating to question TR-1.0-5c
List of SDS

Water Treatment Chemicals		
Chemical	Use	Supplier
Sulfuric Acid	Cooling Tower Treatment	Univar USA, Inc.
Bleach	Biocide	Jenkins, Ind.
Nalco® 3D TRASAR 3DT231	Cooling Tower Treatment	Nalco®

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Hypochlorite 10% sol.
DOCUMENT IDENTIFIER: 449500
SYNONYMS: Aquachlor, Bleach
CHEMICAL FAMILY NAME: Inorganic, salt
NFPA HAZARD RATINGS (H-F-R): 2-0-1
HMIS HAZARD RATINGS (H-F-R): 2-0-1
DISTRIBUTOR: Brenntag Southwest, Inc.
IN CASE OF EMERGENCY CALL: 1-800-424-9300

MSDS PREPARED BY: Brenntag Southwest, inc.
610 Fisher Road
Longview, TX 75604
(903) 759-7151

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENTS</u>	<u>CAS NUMBERS</u>	<u>Percent</u>
Sodium Hypochlorite	007681-52-9	10

Remainder consists of non-hazardous and/or other ingredients below reportable levels.
Trace impurities and additional material names not listed above may also appear in the Regulatory Information Section (Section 15) towards the end of the MSDS.
These materials may be listed for local "Right to Know" compliance and for other reasons.

3. HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW: DANGER! Corrosive! May cause burns to skin and eyes. May be harmful if swallowed or inhaled.

POTENTIAL HEALTH EFFECTS:

SKIN CONTACT: May cause moderate to severe irritation consisting of discomfort, itching, reddening and swelling.
Contact with the skin can cause chemical burns.

**SKIN
ABSORPTION:** No data available

EYES: Contact with the eyes causes redness, tearing, and blurred vision.
May cause burns to eyes.

INGESTION: Ingestion causes pain and inflammation of the mouth, gastrointestinal tract, and erosion of the mucous membranes.

INHALATION: Inhalation may cause irritation, burning sensation, coughing, wheezing, laryngitis, shortness of breath, or headache.
May cause lung damage/edema.

MEDICAL CONDITIONS AGGRAVATED:

No data available

This product does not contain any chemicals reportable under California Proposition 65.
Components found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT</u>	<u>NTP</u>	<u>IARC</u>	<u>OSHA</u>
Sodium Hypochlorite	N	N	N

4. FIRST AID MEASURES

SKIN CONTACT: Remove contaminated clothing and shoes.
Wash exposed areas with soap and water.
Call a physician if irritation persists.

EYE CONTACT: Flush eyes with water for at least 15 minutes.
Get immediate medical attention.

INGESTION: Do not induce vomiting. Give 1-2 glasses of water to dilute. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Do not give anything by mouth to an unconscious person.
Get immediate medical attention.

INHALATION: Remove to fresh air.
If breathing has stopped, give artificial respiration.
Get immediate medical attention.

**NOTES TO
PHYSICIAN:** No data available

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSIVE PROPERTIES

FLASH POINT:	Not applicable °F
FLASH POINT:	Not applicable °C
FLASH POINT METHOD:	Not applicable
LOWER FLAMMABILITY LIMIT:	Not available
UPPER FLAMMABILITY LIMIT:	Not available
AUTOIGNITION TEMPERATURE:	Not available °F, Not available °C
FLAMMABILITY CLASSIFICATION:	Not applicable
EXTING. MEDIA:	This product is not flammable. Use extinguishing media for surrounding fire.
FIRE FIGHTING:	Use water spray to disperse vapors and to provide protection for persons attempting to stop leak. Cool fire-exposed containers with water spray.
PROTECTIVE EQUIPMENT:	Use NIOSH-approved self-contained breathing apparatus and complete protective clothing when fighting chemical fires.
FIRE HAZARDS:	Closed containers of this product may explode when exposed to excessive heat. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Avoid contact with combustible materials. May ignite or explode on contact with combustible materials.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS:	Contain spill and ventilate area. Absorb on inert media and containerize for disposal.
LARGE SPILLS:	Contain spill and ventilate area. Permit only trained personnel wearing full protective equipment to enter the spill area. Collect the spill in a waste container or remove with a vacuum truck. Prevent spill from entering natural watercourses.

PROTECTIVE EQUIPMENT\ SPILL-RELEASE INSTRUCTIONS:

Do not use combustible absorbents. Wear complete protective clothing when cleaning up chemical spills. Spills and releases may have to be reported to federal and/or local authorities. See the Regulatory Information section (section 14) regarding reporting requirements.

7. HANDLING AND STORAGE

HANDLING: Avoid contact with skin, eyes, and clothing.

Avoid breathing product vapors and mists.

Do not take internally.

Wash thoroughly after handling this material.

Use this material only with adequate ventilation.

STORAGE: Keep container closed when not in use.

This material should be stored in a dry, cool place. Store in well-ventilated areas and at moderate temperatures.

Protect against physical damage.

The empty container is hazardous.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Good general ventilation (typically 10 air changes/hour) should be used. Ventilation rates should be matched to conditions. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

SKIN: Wear protective gloves made of neoprene or rubber.

EYE: Wear chemical safety goggles.

If engineering controls do not maintain airborne concentrations below recommended limits, wear a NIOSH-approved respirator for dusts and mists.

RESPIRATORY:

OTHER: Emergency showers, eyewash stations, and fire blankets should be accessible. Wear protective clothing.

EXPOSURE GUIDELINES:

INGREDIENT	ACGIH	ACGIH	OSHA	OSHA
	TLV	STEL	PEL	STEL
Sodium Hypochlorite	N/EST	N/EST	N/EST	N/EST

N/EST = Not established

See 29 CFR 1910.1000 (D) (2) and ACGIH "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices" booklet (Appendix C) for the determination of exposure limits for mixtures. Consult an industrial hygienist or similar professional to confirm that the calculated exposure limits are appropriate.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
APPEARANCE	Clear, pale yellow or green
ODOR:	Chlorine
SPECIFIC GRAVITY:	1.2
SOLUBILITY (IN WATER):	Complete
BOILING POINT (°F):	Not available
BOILING POINT (°C):	Not available
FREEZING POINT (°F):	Not available
FREEZING POINT (°C):	Not available
MELTING POINT (°F):	Not available
MELTING POINT (°C):	Not available
PRODUCT pH:	12-13
VAPOR PRESSURE:	17.5 @ 20 C
REFERENCE PRESSURE:	mm Hg
VAPOR DENSITY:	Not available
EVAPORATION RATE:	Not available
VISCOSITY:	Not available
% VOLATILES:	Not available

10. STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	Exposure to high temperatures should be minimized.
INCOMPATIBILITY:	Combustible materials Acids Amines Reducing agents Metals
DECOMPOSITION:	Oxides of chlorine
POLYMERIZATION WILL OCCUR:	No

11. TOXICOLOGICAL INFORMATION

IMMEDIATE EFFECTS:	May cause burns to skin and eyes. May be harmful if swallowed or inhaled. Irritation data: 10 mg eyes-rabbit moderate. Toxicity data: 1 gm/kg oral-woman TD Lo; 45 mg/kg intravenous-man TD Lo; 5800 mg/kg oral-mouse LD50; 140 mg/kg/9 weeks continuous-rat TD Lo.
CARCINOGENICITY:	No data available
MUTAGENICITY:	Mutation in microorganisms-Salmonella typhimurium 1 mg/plate (-S9); DNA repair-Escherichia coli 20 ug/disc; DNA damage-Escherichia coli 420 umol/L; phage inhibition capacity-Escherichia coli 103 ug/well; micronucleus test-non-mammalian species multiple 200 ppb; cytogenetic analysis-non-mammalian species multi 120 ug/L; cytogenetic analysis-human lymphocyte 100 ppm 24 hours; sister chromatid exchange-human embryo 149 mg/L; cytogenetic analysis-hamster lung 100 mg/L.
EPIDEMIOLOGY:	No data available
TERATOGENICITY:	No data available
REPRODUCTIVITY:	No data available
NEUROTOXICITY:	No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Fish toxicity: 94.0 ug/L 96 hours LC50 (mortality) CUTthroat trout (*Oncorhynchus clarki*). Invertebrate toxicity: 31.6 ug/L 7 hours IC50 (species diversity) Protozoan phylum (Protozoa). Algal toxicity: 90 ug/L 96 hours LC50 (mortality) Algae, phytoplankton, algal mat (Algae). Phytotoxicity: 230 ug/L 35 hours (biomass) Curles pondweed (*Potamogeton crispus*). Other toxicity: 2.1 ug/L 28 days (chlorophyl) Aquatic community (Aquatic community).

13. DISPOSAL CONSIDERATIONS

RCRA WASTE:	Yes
RCRA ID NUMBER:	D002 (If pH >12.5)
VOC CONTENT (lbs/gal):	Not applicable
Waste Disposal Procedure:	Discharge, treatment, or disposal may be subject to Federal, State, or Local laws. State and Local regulations and restrictions are complex and may differ from Federal disposal regulation. The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA Classification and the proper disposal method.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME:	Hypochlorite solutions (Sodium Hypochlorite)
D.O.T. HAZARD CLASS:	Class 8, No division Corrosive materials
DOT ID NUMBER:	UN 1791
DOT PACKING GROUP:	II
DOT RQ (lbs):	1000
CONTRIBUTING CHEMICAL:	Sodium Hypochlorite
OTHER:	Labels required: Corrosive
MARINE POLLUTANT:	No

OTHER REGULATORY INFORMATION

IMDG HAZARD CLASS: 8 - Corrosive materials

ICAO HAZARD CLASS: 8 - Corrosive

15. REGULATORY INFORMATION

FEDERAL REGULATIONS

TSCA (Toxic Substance Control Act): Yes
SECTION 311/312 HAZARD CLASS: Immediate (acute) health hazard

SARA TITLE III (Superfund Amendments and Reauthorization Act):

<u>INGREDIENTS</u>	<u>CAS NUMBERS</u>	<u>Section 313</u>	<u>Section 302</u>
Sodium Hypochlorite	007681-52-9	N	N

**WHMIS CLASSIFICATION
(CANADA):**

Class E

FOREIGN INVENTORY:

EINECS (European Inventory of Existing
Commercial Chemical Substances)
Canadian DSL (Domestic Substances List)

STATE RIGHT TO KNOW

CALIFORNIA PROP 65

This product does not contain any chemicals reportable under California Proposition 65.

MASSACHUSETTS SUBSTANCE LIST: Sodium Hypochlorite
NEW JERSEY SUBSTANCE LIST: Sodium Hypochlorite
**PENNSYLVANIA HAZARDOUS SUBSTANCE
LIST:** Sodium Hypochlorite

16. OTHER INFORMATION

CREATION DATE: 10/10/1997

REVISION DATE: 04/-1/2013

DISCLAIMER:

The information herein is presented in good faith and is believed to be correct as of the date hereof. However, Brenntag Southwest, Inc. makes no representation as to the completeness and accuracy thereof. Users must make their own determination as to the suitability of the product for their purposes prior to use. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature with respect to the product or to the information herein is made hereunder. Brenntag Southwest, Inc. shall in no event be responsible for any damages of whatsoever nature directly or indirectly resulting from the publication, or use of, or reliance upon the information contained herein.

EXPLANATION OF ABBREVIATIONS:

N/EST = Not Established

N/AP = Not Applicable

N/AV = Not Available

UNIVAR USA INC.
ISSUE DATE:2013-05-17
Annotation:

MSDS NO:CDS1741
VERSION:003 2013-05-17

COMPANY IDENTITY: Univar USA Inc.
PRODUCT IDENTITY: SULFURIC ACID 77 - 100%

SDS DATE: 05/17/2013
REPLACES: 07/29/2011

SAFETY DATA SHEET

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: SULFURIC ACID 77 - 100%
SDS NUMBER: CDS1741
NEW MSDS DATE: 07/29/2011
COMPANY IDENTITY: Univar USA Inc.
COMPANY ADDRESS: 17425 NE Union Hill Road
COMPANY CITY: Redmond, WA 98052
COMPANY PHONE: 1-425-889-3400
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)



SECTION 2. HAZARDS IDENTIFICATION

DANGER!!

EXPOSURE PREVENTION: AVOID ALL CONTACT!
PREVENT DISPERSION OF MISTS OR DUST!

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300s = Health, H400s = Environmental

H290 May be corrosive to metals.
H300 Fatal if swallowed.
H314 Causes severe skin burns and eye damage.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P223 Keep away from any possible contact with water, because of violent reaction & possible flash fire.
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do - Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#	EINECS#	WT %
Sulfuric Acid*	7664-93-9	231-639-5	77-100
Water	7732-18-5	231-791-2	0-23

TRACE COMPONENTS: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SEE SECTIONS 8, 11 & 12 FOR TOXICOLOGICAL INFORMATION.

COMPANY IDENTITY: Univar USA Inc.
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SDS DATE: 05/17/2013
REPLACES: 07/29/2011

SECTION 4. FIRST AID MEASURES

GENERAL ADVICE:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists, refer to Section 8 for specific personal protective equipment.

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. "Roll" eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

After high vapor exposure, remove to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. Breathing is difficult, give oxygen. If breathing has stopped, trained personnel should immediately begin artificial respiration. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If the heart has stopped, trained personnel should immediately begin cardiopulmonary resuscitation (CPR). Seek immediate medical attention. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. DO NOT INDUCE VOMITING. Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation).

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSION PREVENTIVE MEASURES

Not Applicable.

EXTINGUISHING MEDIA

Expect violent reaction with water. For small fires use dry chemical, carbon dioxide or halon. For large fires, flood fire area with water from a distance. Do not get solid stream of water on spilled material.

SPECIAL FIRE FIGHTING PROCEDURES

Water spray may be ineffective on fire but can protect fire-fighters & cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots). Use NIOSH approved positive-pressure self-contained breathing apparatus.

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SECTION 5. FIRE FIGHTING MEASURES (CONTINUED)

UNUSUAL EXPLOSION AND FIRE PROCEDURES

Noncombustible.

Reacts with most metals producing hydrogen which is extremely flammable & may explode. Applying to hot surfaces requires special precautions. Closed containers may explode if exposed to extreme heat.

SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PROTECTIVE EQUIPMENT

The proper personal protective equipment for incidental releases (such as: 1 liter of the product released in a well-ventilated area), use impermeable gloves (triple-gloves (rubber gloves and nitrile gloves, over latex gloves), goggles, face shield, and appropriate body protection. In the event of a large release, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard hat. Self-Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, select NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container. Keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with polypads or other suitable absorbent materials. If necessary, neutralize using suitable buffering material, (acid with soda ash or base with phosphoric acid), and test area with litmus paper to confirm neutralization. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13 - Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING

Use only with adequate ventilation. Do not get in eyes, on skin or clothing. Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse. NEVER pour water into this substance. When dissolving or diluting, always add it slowly to the water. To minimize static discharge when transferring, ensure electrical continuity by bonding and grounding all equipment. Use an inlet line diameter of at least 3.5 inches (8.9 centimeters) with a maximum flow rate of 1 meter/second.

STORAGE

Keep separated from strong oxidants, strong bases, combustible & reducing substances, metals, food & feedstuffs, incompatible materials. May be stored in stainless steel containers. See: Section 10, <Materials to Avoid>. Do not store above 49 C/120 F. Keep container tightly closed & upright when not in use to prevent leakage. Reacts with most metals producing hydrogen which is extremely flammable & may explode. Wear full face shield, gloves & full protective clothing when opening or handling. When empty, drain completely, replace bungs securely.

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SECTION 7. HANDLING AND STORAGE (CONTINUED)

BULK CONTAINERS:

All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

TANK CAR SHIPMENTS:

Tank cars carrying this product should be loaded and unloaded in strict accordance with tank-car manufacturer's recommendation and all established on-site safety procedures. Appropriate personal protective equipment must be used (see Section 8, Engineering Controls and Personal Protective Equipment.). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level, brakes must be set or wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tanks (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:

Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	EINECS#	TWA (OSHA)	TLV (ACGIH)
Sulfuric Acid*	7664-93-9	231-639-5	None Known	None Known
Water	7732-18-5	231-791-2	None Known	None Known

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS

Maintain airborne contaminant concentrations below exposure limits given above. If respiratory protection is needed, use only protection authorized in 29 CFR 1910.134, European Standard EN 149, or applicable State regulations. If adequate ventilation is not available or there is potential for airborne exposure above the exposure limits, a respirator may be worn up to the respirator exposure limitations, check with respirator equipment manufacturer's recommendations/limitations. For a higher level of protection, use positive pressure supplied air respiration protection or Self Contained Breathing Apparatus or if oxygen levels are below 19.5% or are unknown.

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS

Positive pressure, full-face piece Self Contained Breathing Apparatus; or positive pressure, full-face piece Self Contained Breathing Apparatus with an auxilliary positive pressure Self Contained Breathing Apparatus.

VENTILATION

LOCAL EXHAUST: Necessary MECHANICAL (GENERAL): Necessary
SPECIAL: None OTHER: None
Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

EYE PROTECTION:

Splash goggles or safety glasses. Face-shields are recommended when the operation can generate splashes, sprays or mists.

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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

HAND PROTECTION:

Wear appropriate impervious gloves for routine industrial use. Use impervious gloves for spill response, as stated in Section 6 of this SDS (Accidental Release Measures).

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

BODY PROTECTION:

Use body protection appropriate for task. Cover-all, rubber aprons, or chemical protective clothing made from impervious materials are generally acceptable, depending on the task.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash after each workshift & before eating, smoking or using the toilet. Promptly remove contaminated clothing. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE:	Oily Liquid, Water-White
ODOR:	None
ODOR THRESHOLD:	Not Available
pH (Neutrality):	0.0
MELTING POINT/FREEZING POINT:	-11 to -29 C / +12 to -20 F
BOILING RANGE (IBP,50%,Dry Point):	193 to 276 C / 380 to 529 F
FLASH POINT (TEST METHOD):	Not Applicable
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C	17.5
VAPOR DENSITY (air=1):	Not Applicable
GRAVITY @ 68/68F / 20/20C:	
SPECIFIC GRAVITY (Water=1):	1.70 to 1.84
POUNDS/GALLON:	14.2 to 15.3
WATER SOLUBILITY:	Complete
PARTITION COEFFICIENT (n-Octane/Water):	Not Available
AUTO IGNITION TEMPERATURE:	Not Applicable
DECOMPOSITION TEMPERATURE:	Not Available

SECTION 10. STABILITY & REACTIVITY

STABILITY

Stable but Reacts with most metals producing hydrogen which is extremely flammable & may explode.

CONDITIONS TO AVOID

Avoid alkalis. When diluting, always add acid to diluent. DON'T add diluent to acid.

MATERIALS TO AVOID

The substance is a strong acid, reacts violently with bases and is corrosive. Upon heating, irritating and toxic fumes are formed including sulfur oxides. The substance is a strong oxidant & reacts violently with combustible & reducing materials. Corrosive to most common metals forming flammable/explosive gas (hydrogen).

Sulfuric acid reacts violently with water & organic materials with much heat. Isolate from organics, chlorates, carbides, fulminates, picrates, metals. Fire risk on contact with organic materials and chemicals such as nitrates, carbides, and chlorates.

HAZARDOUS DECOMPOSITION PRODUCTS

Sulfur Oxides.

HAZARDOUS POLYMERIZATION

Will not occur.

UNIVAR USA INC.
ISSUE DATE:2013-05-17
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SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE HAZARDS

EYE & SKIN CONTACT:

Severe burns to skin, defatting, dermatitis.
Severe burns to eyes, redness, tearing, blurred vision.
Liquid can cause severe skin & eye burns. Wash thoroughly after handling.

INHALATION:

Severe respiratory tract irritation may occur. Vapor harmful.

SWALLOWING:

Harmful or fatal if swallowed.

SUBCHRONIC HAZARDS/CONDITIONS AGGRAVATED

CONDITIONS AGGRAVATED:

Persons with skin conditions should avoid use.

CHRONIC HAZARDS

CANCER, REPRODUCTIVE & OTHER CHRONIC HAZARDS:

Sulfuric Acid in the form of strong inorganic acid mists is known to cause cancer.

IRRITANCY OF PRODUCT: This product is irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: No component of this product is known to be a sensitizer.

MUTAGENICITY: This product is not reported to produce mutagenic effects in humans.

EMBRYOTOXICITY: This product is not reported to produce embryotoxic effects in humans.

TERATOGENICITY: This product is not reported to produce teratogenic effects in humans.

REPRODUCTIVE TOXICITY: This product is not reported to cause reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (such as: within the eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MAMMALIAN TOXICITY INFORMATION

Oral LD50 (Rats):	2140 mg/kg
Dermal LD50 (Rabbit):	Not Available
LC50 (Inhalation, Rats):	510 mg/m3 (4 hour exposure)
Skin effects (Rabbit):	Severe irritation
Eye effects (Rabbit):	Severe irritation
LD (adult human):	between 5 ml and 15 ml (concentrated sulfuric acid)

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SECTION 12. ECOLOGICAL INFORMATION

AQUATIC ANIMAL INFORMATION:

No aquatic environmental information is available on this product.
The substance is harmful to aquatic organisms.

MOBILITY IN SOIL

Mobility of this material has not been determined.

DEGRADABILITY

This product is completely biodegradable.

ACCUMULATION

Bioaccumulation of this product has not been determined.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste disposal requirements. Do not dispose of on land, in surface waters, or in storm drains. Waste should be recycled or disposed of in accordance with regulations. Large amounts should be collected for reuse or consigned to licensed hazardous waste haulers for disposal.
ALL DISPOSAL MUST BE IN ACCORDANCE WITH ALL FEDERAL, STATE, PROVINCIAL, AND LOCAL REGULATIONS. IF IN DOUBT, CONTACT PROPER AGENCIES. EPA CHARACTERISTIC: D002.

SECTION 14. TRANSPORT INFORMATION

> 1099 LB / 499 KG OF THIS PRODUCT IN 1 CONTAINER EXCEEDS THE "RQ" OF SULFURIC ACID.

DOT SHIPPING NAME: UN1830, Sulfuric acid, 8, PG-II
DRUM LABEL: (CORROSIVE)
IATA / ICAO: UN1830, Sulfuric acid, 8, PG-II
IMO / IMDG: UN1830, Sulfuric acid, 8, PG-II
EMERGENCY RESPONSE GUIDEBOOK NUMBER: 137



SECTION 15. REGULATORY INFORMATION

EPA REGULATION:

SARA SECTION 311/312 HAZARDS: Acute Health

All components of this product are on the TSCA list.

SARA Title III Section 313 Supplier Notification

This product contains the indicated <*> toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-To-Know Act of 1986 & of 40 CFR 372. This information must be included in all MSDSs that are copied and distributed for this material.

SARA TITLE III INGREDIENTS	CAS#	EINECS#	WT% (REG.SECTION)	RQ(LBS)
Sulfuric Acid	7664-93-9	231-639-5	77-100 (302,311,312,313)	1000

Any release equal to or exceeding the RQ must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR 302.6 and 40 CFR 355.40 respectively. Failure to report may result in substantial civil and criminal penalties. State & local regulations may be more restrictive than federal regulations.

UNIVAR USA INC.
ISSUE DATE:2013-05-17
Annotation:

MSDS NO:CDS1741
VERSION:003 2013-05-17

COMPANY IDENTITY: Univar USA Inc.
PRODUCT IDENTITY: SULFURIC ACID 77 - 100%

SDS DATE: 05/17/2013
REPLACES: 07/29/2011

SECTION 15. REGULATORY INFORMATION (CONTINUED)

SARA Title III Section 302 (Extremely Hazardous Substance List) : Sulfuric Acid.

CLEAN WATER ACT:

Sulfuric Acid is listed as a Hazardous Substance under the Clean Water Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65: WARNING: This product contains Sulfuric Acid, listed as "Strong inorganic acid mists contain", a chemical known to the state of California to cause cancer.

INTERNATIONAL REGULATIONS

The components of this product are listed on the chemical inventories of the following countries:

Australia (AICS), Canada (DSL, NDSL), China (IECSC), Europe (EINECS, ELINCS), Japan (METI/CSCL, MHLW/ISHL), South Korea (KECI), New Zealand (NZIoC), Philippines (PICCS), Switzerland (SWISS), Taiwan (NECSI), USA (TSCA).

CANADA: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

D1A: Material causing immediate and serious toxic effects (VERY TOXIC), (Sulfuric Acid)

D2B: Irritating to skin / eyes.

E: Corrosive Material.

SECTION 16. OTHER INFORMATION

HAZARD RATINGS:

HEALTH (NFPA): 3, HEALTH (HMIS): 3, FLAMMABILITY: 0, REACTIVITY: 2
(Personal Protection Rating to be supplied by user based on use conditions.)
This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating systems.

EMPLOYEE TRAINING

See Section 2 for Risk & Safety Statements. Employees should be made aware of all hazards of this material (as stated in this SDS) before handling it.

Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

Notice

Univar USA Inc. ("Univar") expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

ATTACHMENT 9

TR1.0 – 6

Stormwater Management

Attachment 9
Relating to - TR 1.0-6a
Stormwater Management

6. Briefly describe the industrial processes and activities that occur outdoors or in some manner that may result in exposure of the materials to precipitation or runoff in areas where runoff is generated.

Drainage from potentially chemically contaminated process areas is controlled as follows: all potentially chemically contaminated process areas are routed through drains to chemical sumps A, B, C, D, E, F, G, H, J or K. These sumps have automatic level controls and are pumped to the wastewater system feed tank TK-211. The water from the chemical sumps is treated in the wastewater treatment system. Leaks and spills that reach the chemical sump (depending on spill type and volume) can either be stopped at the sump and evacuated to another container, or be allowed to enter the treatment process. Under some severe storm conditions, each sump is pumped completely to TK-211. A sample is collected from all low contamination tank containments and then analyzed for pH and TOC prior to routing to TK-722. If results exceed stormwater permit limits, containment is routed to TK-211 and then to WWTU prior to discharge.

Drainage from low contamination process areas is controlled as follows: all low contamination process areas are routed through trenches and ditches to stormwater sumps 1, 2, 3, 4, 5, 6 or 7. These sumps have automatic level controls and are pumped to the stormwater tank TK-722. Before pumping the contents of TK-722, the tank is circulated, then sampled and analyzed for pH and TOC. Under some severe storm conditions, it may be necessary to bypass TK-722 and discharge directly through Internal Outfall 201 (then to Outfall 001). In severe rare storm conditions, the stormwater may also be pumped over a concrete dike to the drainage ditches through Outfall 002 and Outfall 005.

ATTACHMENT 10

WS7.0 – 3
Site Map

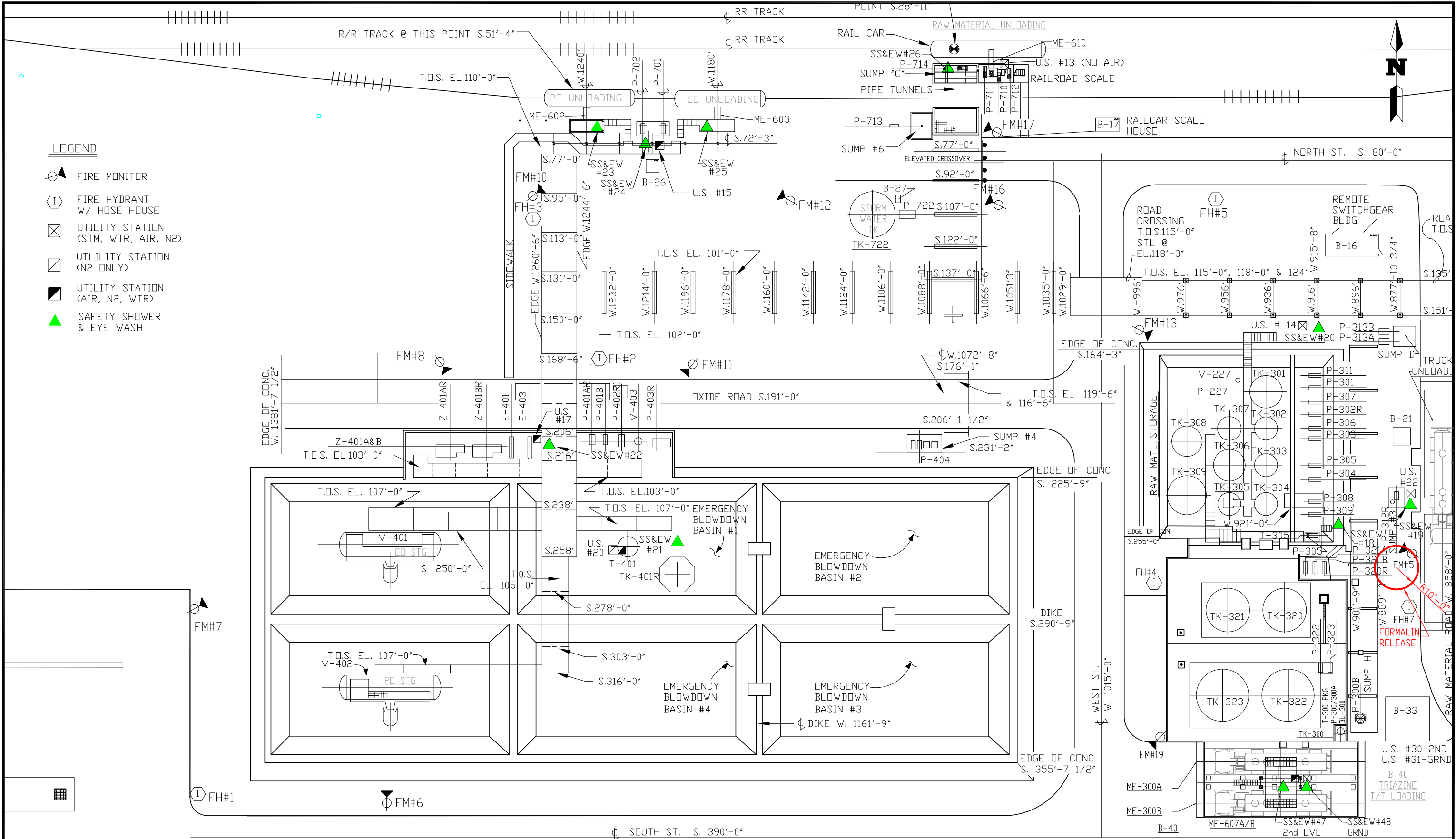
represented on

Plot Plan E.H.&S. Chemical &
Stormwater Drains & Collection
Drawing: B0-7-346

Plot Plan – Environmental
Zoomed In View
Drawing: B0-21A

LEGEND

- FIRE MONITOR
- FIRE HYDRANT W/ HOSE HOUSE
- UTILITY STATION (STM, WTR, AIR, N2)
- UTILITY STATION (N2 ONLY)
- UTILITY STATION (AIR, N2, WTR)
- SAFETY SHOWER & EYE WASH



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ATTACHMENT 11

WS7.0 – 4c

List of Materials Exposed to Precipitation

Attachment 11
Relating to questions – WS7.0 – 4c
List of Materials and Areas Exposed to Precipitation

Material	Purpose	Location	Likelihood of contact with storm water/ Describe reason/ Flow Direction.	Describe Material Management Practice
Tote Loading	Loading	Loading	Low/Leak/Chemical Sump	Dike or Curb
Tank Truck Loading	Loading	Loading	Low/Leak/Chemical Sump	Dike or Curb
Tote/Tank Trucks/ Drums Loading	Loading/ Unloading	Loading/ Unloading	Low/Leak/Stormwater Ditch	Dike or Curb
Raw Material Tank Truck Loading/Unloading	Loading/ Unloading	Loading/ Unloading	Low/Leak/Chemical Sump	Dike or Curb
Cooling Tower	Cooling Tower	Cooling Tower	Low/Leak/Chemical Sump	Dike or Curb
Process Area Including Oxyalkylate and Resin Reactors	Process Area	Process Area	Low/Leak/Chemical Sump	Dike or Curb
Finished Product/Solvent Area	Storage Area	Storage Area	Low/Leak/Chemical Sump	Dike or Curb
Oil Drum Storage	Oil Drum Storage	Concrete pad outside	Low/Leak/Chemical Sump	Dike or Curb
Drum Storage	Drum Storage	Warehouse	Low/Leak/Inside Containment	Drums Sealed
Resin Products	Storage Tank	TK-111	Low/Leak/Chemical Sump	Dike or Curb
Resin Products	Storage Tank	TK-112	Low/Leak/Chemical Sump	Dike or Curb
Resin Products	Storage Tank	TK-113	Low/Leak/Chemical Sump	Dike or Curb
Resin Products	Storage Tank	TK-114	Low/Leak/Chemical Sump	Dike or Curb
Intermediate	Storage Vessel	TK-115	Low/Leak/Chemical Sump	Dike or Curb
Intermediate	Storage Vessel	TK-116	Low/Leak/Chemical Sump	Dike or Curb
Intermediate	Storage Vessel	TK-117	Low/Leak/Chemical Sump	Dike or Curb
Premix (EPON)	Storage Tank	TK-119	Low/Leak/Chemical Sump	Dike or Curb
Resin Product	Storage Tank	TK-125	Low/Leak/Chemical Sump	Dike or Curb
Blend Product	Storage Tank	TK-126	Low/Leak/Chemical Sump	Dike or Curb
Diesel	Storage Tank	TK-133	Low/Leak/Firewater Pond	Dike or Curb
Diesel	Storage Tank	TK-134	Low/Leak/Chemical Sump	Dike or Curb
Diesel	Storage Tank	TK-135	Low/Leak/Chemical Sump	Dike or Curb
Effluent Surge	Storage Tank	TK-211	Low/Leak/Chemical Sump	Facility drainage and collection in ditches
Mixed Chemicals	Storage Tank	TK-214	Low/Leak/Chemical Sump	Dike or Curb
Process Scrubber Blowdown	Storage Tank	TK-221	Low/Leak/Chemical Sump	Dike or Curb
Raw Material/Solvent	Storage Tank	TK-231	Low/Leak/Chemical Sump	Dike or Curb
Isopropanol	Storage Tank	TK-232	Low/Leak/Chemical Sump	Dike or Curb
Isopropanol	Storage Tank	TK-233	Low/Leak/Chemical Sump	Dike or Curb
Isopropanol	Storage Tank	TK-234	Low/Leak/Chemical Sump	Dike or Curb
Blend Product	Storage Tank	TK-301	Low/Leak/Chemical Sump	Dike or Curb
Blend Product	Storage Tank	TK-302	Low/Leak/Chemical Sump	Dike or Curb
Solvent	Storage Tank	TK-303	Low/Leak/Chemical Sump	Dike or Curb
Solvent	Storage Tank	TK-304	Low/Leak/Chemical Sump	Dike or Curb
Butyl Phenol	Storage Tank	TK-305	Low/Leak/Chemical Sump	Dike or Curb

Material	Purpose	Location	Likelihood of contact with storm water/ Describe reason/ Flow Direction.	Describe Material Management Practice
Solvent	Storage Tank	TK-306	Low/Leak/Chemical Sump	Dike or Curb
Solvent	Storage Tank	TK-307	Low/Leak/Chemical Sump	Dike or Curb
Kerosene	Storage Tank	TK-308	Low/Leak/Chemical Sump	Dike or Curb
NonylPhenol	Storage Tank	TK-309	Low/Leak/Chemical Sump	Dike or Curb
Finished Product	Storage Tank	TK-350	Low/Leak/Chemical Sump	Dike or Curb
Finished Product	Storage Tank	TK-351	Low/Leak/Chemical Sump	Dike or Curb
Sulfuric Acid	Storage Tank	TK-401	Low/Leak/Chemical Sump	Dike or Curb
Diesel	Storage Tank	TK-601B	Low/Leak/Chemical Sump	Dike or Curb
Diesel	Storage Tank	TK-603A	Low/Leak/Chemical Sump	Dike or Curb
Diesel	Storage Tank	TK-603B	Low/Leak/Chemical Sump	Dike or Curb
Storm Water	Storage Tank	TK-722	Low/Leak/Chemical Sump	Dike or Curb
Product	Reactor	V-121	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-122	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-123	Low/Leak/Chemical Sump	Dike or Curb
Product	Reactor	V-124	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-145	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-146	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-161	Low/Leak/Chemical Sump	Dike or Curb
Product	Packaging Tank	V-162	Low/Leak/Chemical Sump	Dike or Curb
Intermediate	Vessel	V-163	Low/Leak/Chemical Sump	Dike or Curb
Intermediate	Vessel	V-164	Low/Leak/Chemical Sump	Dike or Curb
Ethylene Oxide	Storage Vessel	V-401	Low/Leak/Chemical Sump	Dike or Curb
Propylene Oxide	Storage Vessel	V-402	Low/Leak/Chemical Sump	Dike or Curb

ATTACHMENT 12

Hydro-Organic UV Light

Guide to the Atlantium Hydro-Optic UV System

RZ104 Series

All In One Control Module

For General Applications

Ultrasonic Cleaner Option

**Supported Electrical Voltage:
400/440/480VAC**

Document No. PE12A000E

June 2022



System and accessory specifications are subject to change without notice.

IMPORTANT NOTICE

It is strictly forbidden to alter/change the system hardware in any way.

Any change made without written permission from Atlantium shall void the warranty.



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Validations and certifications completed:



Revision History

Rev. #	Description	Date
001	AIO version based on previous Control Module versions. Removed old drawings. Added AIO conditionals. Added images for Connection Box cards. Unified electrical versions 400/440/480VAC.	Dec 2018
002	Unified files for General, Aquaculture, and Power Plant applications	Jan 2019
003	Added: Electrical requirements for locations with 440Y/254 VAC 3~ +PE 50/60HZ or 480Y/277 VAC 3~ +PE 50/60HZ	Mar 2019
004	Update to entire manual based on review by RNT Consulting Inc. to address gaps and provide clarifications Remove references to specific lamp numbers. Control software version AIO 2.1.1-B40 Application of EC180076/55/19; FCO180106	June 2020
005	Updated Modbus tables + Minor modifications008	July 2021
006	Logo changes	Nov 2021
007	Performance changes	Jan 2022
008	US performance - changes	June 2022



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1 Introduction

Congratulations on purchasing an Atlantium **RZ104 Series** Hydro-Optic UV Water Treatment System. This user guide provides you with clear guidelines for preparing the site for installation, correct installation and software configuration procedures, and a good understanding of all system functions for maximum benefit from your Atlantium Unit.

Atlantium systems are designed to provide applications for the following Industries:

- | | |
|--------------------|-----------------|
| ■ Aquaculture | ■ Bio-Pharma |
| ■ Fish Hatcheries | ■ Bottled Water |
| ■ Dairy | ■ Beverages |
| ■ Municipal | ■ Breweries |
| ■ Power Generation | ■ Aquariums |
| ■ Ultra Pure Water | ■ ...and more |
| ■ Marine | |

Patented Innovative Technology

- Features Hydro-Optic engineering that optimizes UV efficiency and enables uniform dose distribution
- Medium Pressure High Intensity lamps provide a UV dose in the 200 to 454 nm spectrum which is much broader than low pressure UV (which yields a dose in the 254 nm range only). UV exposure is effective in cold & warm water .
- Sustainable operation provides the security and reliability that the industry demands.
- Uses "total internal reflection" of UV light within the reaction chamber, enabling more effective treatment at a lower dose.
- Some enclosures/components as noted on the Atlantium main website under <https://atlantium.com/about.html> include:
 - Nema 4x rating for indoor and outdoor use, protection against windblown dust and rain, splashing water and hose directed water.
 - IP56 rating protection from limited dust ingress. Protected from high pressure water jets from any direction

Real-time Monitoring and Control

- The sophisticated data logging system enables traceability over time of all monitored data.
- It maintains a database and provides detailed analysis and reporting functions that can be used for trend analysis or proof of compliance.

Controlled Dose Delivery

- Monitoring & control software ensures that required UV dose is being delivered at all times.
- Dedicated UV Intensity Sensor (UVIS) for each lamp for real-time monitoring.
- Automatically adjusts lamp power based on real-time analyses of critical parameters such as water flow rate, lamp intensity and water Transmission to UV (UVT).
- A user-friendly interface displays the monitored data in real-time including the actual delivered dose as well as the other critical parameters, so you can verify that you are actually getting the dose that you need.

Lower Electrical Consumption

- Optimized light distribution, through Hydraulic and Fiber optic principles applied to the UV system design, enable:
- Optimized UV power and uniform dose distribution.
- Efficient use of power, with lower electrical consumption than low-pressure based UV systems.

Minimum Down Time

- True in-line system.
- Quick lamp replacement (4 minutes) and better safety.

Integrates with your Process Line

- Field proven installation.
- With no additional software, you can integrate the Atlantium system into your current process using Atlantium's customizable settings.
- Automatically generated reports at the push of a button for performance recording and traceability.

Efficiency and Easy Maintenance

- For maximum efficiency and dependable performance, the Atlantium system monitors the lamps for UV output, ensuring that a lamp is replaced only when absolutely needed.
- By following the easy preventive maintenance programs, you keep the system working at peak performance.
- The **Viewport** allows you to safely peek at what's going on inside.

For further information about Atlantium products and technologies, visit our website at <https://atlantium.com/>

1.1 Before You Begin

Before you begin using this product, or any installation or service operation, please read the following safety information:

- Attention to these warnings helps prevent personal injuries and damage.
- It is your responsibility to use the product in an appropriate manner.
- This product is designed for use solely indoors.
- You are responsible if the product is used for other than its designated purpose or in disregard of Atlantium instructions. Atlantium shall assume no responsibility in any way for such use of the product.
- The product must be used for its design purpose, based on its product documentation and within its performance limits.
- Using the product requires technical skills. It is therefore essential that only skilled and specialized staff or thoroughly trained personnel be allowed to use the product.
- Keep the basic safety instructions and the product documentation in a safe place and pass them on to the users.
- Applicable local or national safety regulations and rules for the prevention of accidents must be observed at all times.

1.2 Tags and Their Meaning

The following indicators are used in the product documentation to warn the reader about risks and dangers



DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



ATTENTION!

Indicates the possibility of incorrect operation which can result in damage to the product.



Indicates a hazardous situation involving electricity which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving Electrostatic Discharge (ESD), which, if not avoided, can result in damage to the product.



Indicates a hazardous situation involving UV light which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving a hot surface which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving working in an enclosure with moving parts, which if not avoided, can result in serious injury to the hands.



Indicates a hazardous situation involving mercury, a poisonous material which, if not avoided, can result in death or serious injury.



Indicates a hazardous situation involving caustic chemicals which, if not avoided, can result in death or serious damage.



Indicates that components or equipment are heavy and care is to be taken to avoid lifting incorrectly. Incorrect lifting can be dangerous to the personnel lifting and may result in dropping and damaging the components or equipment.



Indicates that components or materials to be discarded are classified as hazardous waste and must be disposed of appropriately.



Indicates information related to installation, safety or use of system.



2 About the RZ104 Series Systems

The Atlantium **RZ104 Series** System includes a chamber with one or more UV lamps, a plug-style Ballast Module for each lamp, and a **Control Module**. The quartz UV chamber takes advantage of **Total Internal Reflection** to reflect UV light back into the water to uniformly distribute the UV dose. Water flows unimpeded, resulting in low head-loss.

Specially-designed short (Arc length 95 mm / 3.74 inch) Medium Pressure High Intensity (MPHI) lamps are used. Enclosing the lamps within a thick quartz sleeve significantly reduces risk of breakage and its consequences. A UV Intensity Sensor (UVIS) provides continuous measurement of each lamp's output.

In addition, a UVT Analyzer reports and tracks the water transparency and a UV-proof viewport allows you to view the inner workings. An optional cleaning system cleans the surface of the quartz sleeves automatically.

2.1 The RZ104-11 Unit

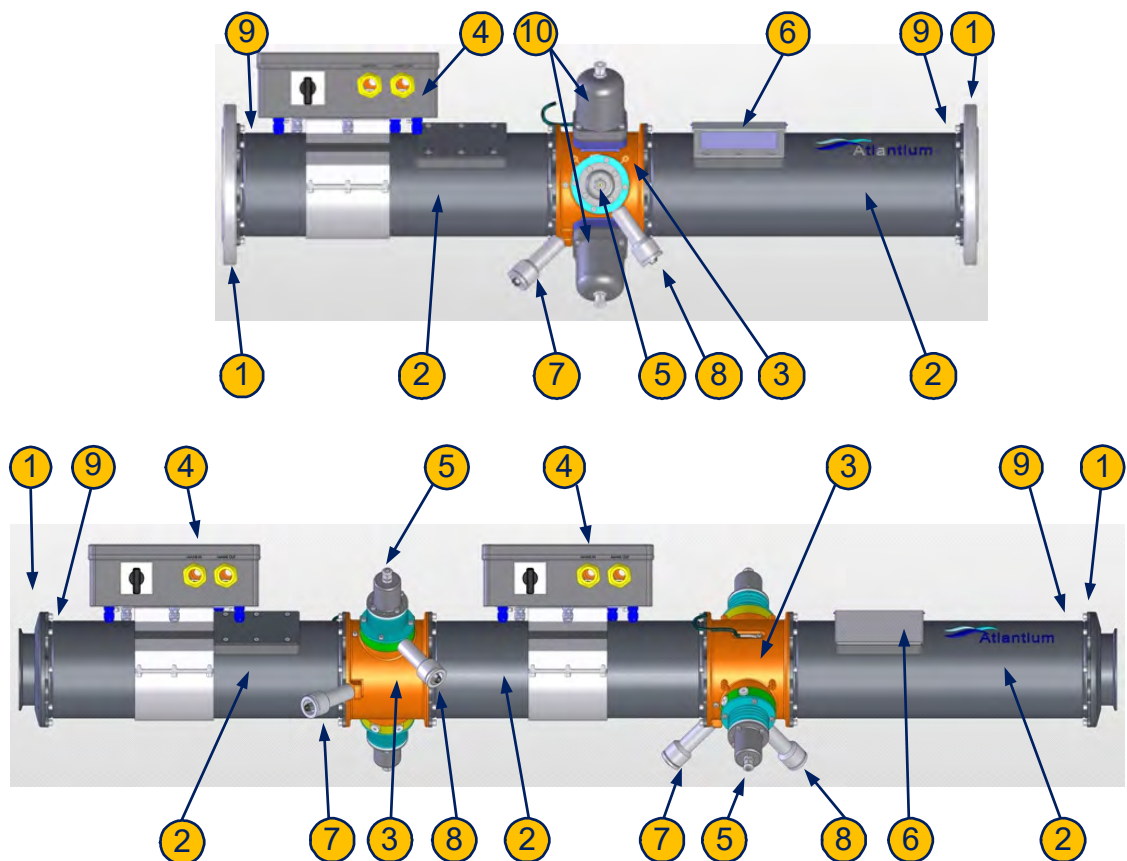


Figure 2-1:
04-11 (top) with ultrasonic cleaner, RZ104-12 (bottom) without cleaner

RZ1

Table 2-1: Components key



The designation of the unit is dependent on the number of UV lamps in the model supplied:

RZ104-11-1X where X= No. of lamps

e.g. **RZ104-11-12** refers to a 2-lamp model

Refer to the accompanying ICD files for full specifications.

#	Item	Description
1	Flange or Ferrule/Tri-Clamp interface	The unit connects to the facility piping via a flange interface as per customer order
2	Lamp Chamber	The chamber that holds the lamps and optional Cleaning system
3	Lamp Arc length (mm / inch): Lamp total length (arc + ceramic ends) (mm / inch):	Lamp encased in quartz tube assembly 95 / 3.74155 / 6.1 262.8 / 10.35322.8 / 12.7
4	Connection Box	The box that sits on top of each lamp unit and holds the electrical circuitry
5	Lamp connector	
6	Viewport	The UV-proof window that enables safe viewing of the interior of the working unit.
7	UVT Analyzer	The sensor that measures the UV transmittance through the water. Together with the UV Intensity sensor and the Control Module, it analyzes, tracks and reports the water quality.
8	UV Intensity Sensor	The sensor that measures the UV intensity in the Lamp chamber and feeds it to the real time dose calculation
9	Lifting strap area	The place designated to fit lifting straps to lift and transport the Unit
10	Ultrasonic Cleaning system	A sophisticated cleaning system for the quartz tube utilizing ultrasonics

2.2 RZ104 Series Interface Control Drawings (ICD)

For full specifications of the supplied system, consult the accompanying **ICD** files.

2.3 Atlantium System Footprint

The Atlantium system has a small, compact footprint that facilitates in-line installation in any process train.

Table 2-4: **RZ104-11/12** Physical Specifications

Item	Detail		
lamps RZ104-11 RZ104-12	1 2		
Atlantium Unit Construction Materials: Casing: Quartz Chamber:	Electro-polished Stainless steel 316 Optional**: Super-Duplex stainless steel UNS S32750 High grade fused silica (Quartz)		
Standard Pipe Flange Interface Options:	Flange		Ferrule/Tri-Clamp
	DIN2527 DN100 PIN16	ANSI B 16.5 4" 150lb	DIN 32676 DN100
Unit Length (mm / inch) RZ104-11 RZ104-12	1039 / 40.9 1565 / 61.62	1047 / 41.2 1573 / 61.92	1075 / 42.3 1601 / 63
Inner Ø Diameter (mm / inch)	100 / 3.94	101.6 / 4	100 / 3.9
Outer Ø Diameter (mm / inch)	220 / 8.66	228.6 / 90	119 / 4.7
Bolt Circle Diameter*	180 / 7.08	191 / 7.52	N/A
Bolt Hole Diameter	19 / 0.75		N/A
Number of Bolts	8		N/A
Width at Widest Point (mm / inch)	119 / 4.7		
Unit Volume (Liter / Gallon) RZ104-11 RZ104-12	8.9 / 2.35 13.3 / 3.5		9 / 2.4 13.3 / 3.5
Weight (without water) (Kg / lb) RZ104-11 RZ104-12	41 / 9.0 66 / 145		37 / 82 61 / 134.5
Service Clearance on each side (mm / inch)	320 / 12.6		
Minimum Height above Floor Level (mm / inch)	750 / 29.5		
Maximum Working Pressure	10 Bars / 145 P.S.I.		
Maximum Flow Rate	Application dependent		
Place for Mounting Brackets on each end of the Unit (RZ104-12 only)	90 / 3.5		

* When tightening bolts to connect piping, use a torque wrench to apply correct and uniform torque, according to accepted standards and practices.

** Super-Duplex is available as an alternative construction material for use with seawater. Consult your Atlantium representative for details.

2.4 The Ballast Module

Ballast Module/Plug-style is a water-proof easy plug-n-play box that contains the ballast power supply and related circuitry. Its convenient plugs make it easy to service. Its modular design makes it serviceable and flexible and easier to fit into an existing plant. A Ballast Module is supplied for each lamp in the Atlantium system. Its heat sink frame complies with industry standards. It can be mounted on the wall or other suitable anchoring point. The location of the Ballast Module/Plug-style must be designated according to the maximum distance needed for positioning the **Cable Harness** of the Atlantium Unit. The **Cable Harness** is **5m / 16.4'** (also available in **10m / 32.8'** length).

For systems with more than one lamp, the Ballast Modules can be positioned one above the other or next to one another. The Ballast Module must have at least 300 mm (11.8 inches) of clearance on its right and left sides for proper ventilation and 300mm (11.8 inches) of clearance on the bottom for cable routing. For more details on mounting, see **Mounting the Power Module** on page 52.

Table 2-5: Ballast Module Physical Details

Physical	Details
Dimensions (H x W x D) (mm/inch): Ballast Module C (Active Cooling)	487/ 19.16 x 348 / 13.7 x 114.5 / 4.51
Weight (Kg/Lb): Ballast Module C	6.5 / 14.3
Heat Load per Ballast Module: (For calculating space cooling requirements)	50W
Operating voltage range of ballast	380 VAC to 578 VAC
Protection Category:	IP 56 (Protected from limited dust ingress. Protected from high pressure water jets from any direction).

2.5 Electrical Usage

2.5.1 Residual Current Device

In addition to the circuit breakers defined in the electrical ICD provided with the **RZ104 Series** system, you should install a Type A Residual Current Device (RCD) as extra protection for your Atlantium system, while ensuring that local safety regulations are complied with.

Atlantium recommends, for example, using ABB P/N F204 A-xx/0.1 RCD, where xx represents value of current that is at least 25% higher than the current rating of the system, provided in the electrical ICD.

When choosing the proper RCD take into account also the mains voltage and phase configuration of your locale.



The RCD should be tested regularly as per the manufacturers recommendations.

2.5.2 Mains power supply up to 480VAC

Atlantium systems require connection to mains power supplies (PS) of 400 to 480 VAC. If the local mains supply is outside of these limits, transformers or other adapters must be installed in order to provide the necessary PS of $\leq 480\text{VAC}$.



Throughout this User Manual, it is assumed that the Atlantium system is connected to a PS of 400 - 480VAC.

The tables below detail the Atlantium Unit's electrical usage and power consumption.

Table 2-6: **RZ104 Series** Unit Electrical Usage

Electrical	Details
Main power source	400 VAC 3~ + N + PE 50/60Hz 440Y/254 VAC 3~ + PE 50/60Hz 480Y/277 VAC 3~ + PE 50/60Hz
Maximum allowed voltage tolerance	$\pm 10\%$ from the nominal voltage

2.5.3 Power, Voltage and Grounding Requirements

The table below details the power consumption for the Atlantium system, according to local mains voltage.



All circuit breakers are sized according to the tables below and are to be type C.



- The power system must be solidly grounded where the nominal line to ground voltage does not exceed 277V.
- The system is not appropriate for use on corner grounded delta, resistance grounded and ungrounded power systems.
- If the power system at the site is not appropriate, you can create an appropriate power feed by using a 1:1 isolation transformer (by grounding the middle point of the star configuration at the secondary side of the transformer).

Table 2-8: Power Consumption for **RZ104** Systems

# of lamps :			n = 1 to 2 lamps
Total nominal lamps power (kW) :			n x 1.0
Cleaner type	Feeding type	Feeding voltage (V)	Total current consumption each phase (A)
No cleaner	Direct Feeding (w/o Transformer)	400	n x 1.6
		440	n x 1.4
		480	n x 1.3
	Through transformer	200 (to 400) (Transformer)	n x 3.7
		230 (to 400) (Transformer)	n x 3.2
		600 (to 480) (Transformer)	n x 1.2
Ultrasonic Cleaner	Direct Feeding	400	n x 1.6 + 1.7
	Direct Feeding (Power Module only for Ultrasonic)	440	n x 1.4 + 1.7
		480	n x 1.3 + 1.7
	Through transformer	200 (to 400) (Transformer)	n x 3.7 + 3.9
		230 (to 400) (Transformer)	n x 3.2 + 3.4
		600 (to 480) (Transformer + Power Module)	n x 1.2 + 1.3

2.5.4 Ensuring Power Stability

The voltage of the electrical supply connected to every Atlantium system **must not vary** by more than $\pm 10\%$ from the correct value (sag, swell and surge) at the system inlet.

To comply with this requirement, you must protect the Atlantium system with a device that prevents electrical surges and fluctuations from causing damage. There are two types of surge protection:

- UPS (Uninterrupted Power Supply) has an internal battery that allows the equipment plugged into it to continue to run in the event of a power outage until power is restored. It also has the benefit of performing the same functionality of surge protectors, protecting against spikes and surges. Make sure to use a UPS that is capable of supplying sufficient current to the system and that the cable length is not more than 10m (33ft) in length. If needed, the UPS allows the system to be shut down cleanly if power is out for a lengthy period.
- Surge protection device protects your equipment from variations in electrical current, such as surges and spikes.



Surge protector devices /UPS must be inspected periodically and replaced if their protection capacity has expired.

2.5.5 Surge Protector Devices

Surge protection devices are designed to protect industrial communication networks. This device recommended by Atlantium uses a combination of 3-electrode gas discharge tubes and fast clamping diodes. Typical applications include industrial processing equipment, transmission systems, I/O cards, probes, actuators, and displays. Surge protection devices are available via Atlantium.

Table 2-9: Surge Protector Details

Atlantium PN	DATA SHEETS	Module PN	Description
EP0002300	DOC002300	8859660000	SURGE PROTECTOR 400V 3P 40KA TNC CONFIG
EP0002600	DOC002600	4983-DS120-402	SURGE PROTECTOR L + N, 115V
EP0002800	DOC002800	1352740000	SURGE PROTECTOR L + N, 230V

2.6 The Control Module

The Atlantium system is monitored and controlled from a **Control Module**. It can be mounted on a wall or suitable anchoring point up to 50 meters (164.04 ft.) from the Atlantium Unit. However, it should be located in a close proximity to the Atlantium Unit in a place that it is easy to reach the touch screen and read the monitoring information. See the **AIO Control Module ICD** accompanying the documentation.

Table 2-10: Control Module Details

Physical	Details
Dimensions (W x D x H) (mm/inch):	400/15.75 x 300/11.82 x 144.4/6.12
Weight (Kg/Lb.):	9.8/21.6
Minimum Clearance for Electrical Cables Routing (mm/inch):	50/2
Maximum Power Consumption:	Maximum 40W
Voltage:	1 or 2 phase 120-240VAC
Protection Category:	IP 56.

2.7 Environmental Requirements

The Atlantium system should be located indoors in an area that is adequately cooled and ventilated with clean airflow. However, there have been many successful Atlantium installations in less friendly environments. For locations with high temperatures - above 45°C (113°F) - air conditioning may be required. Consult with your Atlantium representative.

Table 2-11: **RZ104 Series** System Environmental Details

Environmental	Details
Maximum ambient air temperature:	45°C (113°F)
Maximum ambient air temperature in the Ballast Modules environment:	45°C (113°F)
Maximum atmospheric relative humidity:	90%
Water Temperature:*	
Maximum Water Temperature (lamps off)	90°C (194°F)**
Maximum Water Temperature (lamps on)	60°C (140°F) **
Minimum – cold temperature:	No limit - if the unit is fully drained of water before it freezes



* For water temperature above 70°C (160°F) consult with Atlantium service engineers

** Any deviation from either of these values require consultation with Atlantium applications department and written approval by Atlantium.

2.8 Regulatory Compliance

Atlantium Systems are designed to comply with the following regulatory standards*:

- EMC directive 2014/30/EU
- European Low Voltage Directive (LVD), 2014/35/EU for electrical safety
- Council Directive 98 / 83 / EC of 3 November 1998 for the quality of water intended for human consumption
- ISO 9001-2015 2018-2021 Quality Management Standard - Development, Design, Production and Sales of Water Disinfection Systems
- UL 508, CSA C22.2 No, 14-13. By MET Labs (eurofins) NRTL certification
- IP54/IP56 & TYPE4X
- NSF 61. By NSF International.
- Hygienic certificate, National Institute of Public Health, Poland

**Note: Compliance is model dependent, for more details of specific UV Unit model. Consult your Atlantium representative.*



3 Getting Ready for Installation

Using the guidelines and information in this section, you can prepare the piping and electrical setup for installing the Atlantium Hydro Optic Water Treatment System. If you have any questions, consult with an Atlantium application engineer.

3.1 Planning

Consider where to locate the unit from the perspective of your process. Prepare your installation plan according to the Mechanical and Electrical ICD drawings provided with the system and to planning points below, as well as the other guidelines in this manual.

3.1.1 Access

■ Installation Access

- Take into account that sufficient door space is required to transport the Atlantium Unit into the facility where it is to be placed.
- The Atlantium units are packed and transported in large wooden crates. Consider the need for a place near the installation area for unpacking of the units from the crates, prior to installation.

■ Service Access

- Ensure that sufficient space is required for maintenance personal to access the Atlantium Unit for periodic component replacement and maintenance.
- The installed units must also be accessible: for example if a unit is installed high above the ground, permanent stairs or walkways may be needed for convenient and safe service access
- Ensure sufficient space to access the back of the unit, to allow removal and replacement of lamps as well as to do maintenance on cleaning systems (where these are installed), connection boxes, etc.

■ Installation: vertical or horizontal

- Vertical installation of the Atlantium unit and piping, with an upwards direction of flow, is the preferred configuration for installation, where this is possible.
- If mounting the unit in a horizontal configuration, a slope of at least 5 % is recommended to minimize the risk of air pockets developing or remaining trapped in the Atlantium unit. The Customer is to supply the mechanical means for ensuring this slope.

3.1.2 Hydraulics

■ Piping

- Align the upstream and downstream piping with the designated location for the Atlantium unit.
- Prepare the flanges/ferrules and piping as specified according to **The Piping Infrastructure** on page 28. To avoid a step in the connection, make sure that the internal diameters where the Atlantium Unit and your piping match.
- **Do not** use sealing material that contains graphite when sealing the flanges/ferrules and gaskets as it accelerates the corrosive process on stainless-steel components, including those of the Atlantium system.
- To promote laminar flow of water through the Atlantium unit:
 - ◆ The piping connected to either end of the unit should be of the same diameter as the unit itself. Connection of narrower piping may reduce flow and increase water temperature and turbulence.

- ◆ Allow a straight length of 10 pipe diameters (10D) before the Atlantium unit (upstream) and a straight length of 5 pipe diameters (5D) after the unit (downstream). In situations where less space is available, review with your Atlantium representative.
- ◆ In order to minimize turbulence and air pocket formation in a vertical installation, install a concentric reducer/expander adapter to streamline the transition between piping dimension and the internal dimension of the unit.
- ◆ For a horizontal installation, install an eccentric reducer/expander adapters, with downstream outlet higher than inlet.
- **Mechanics.**
 - Prepare the supports needed for the Atlantium Unit, ensuring that the minimum height above the floor is 750mm / 29.5 inch. Check that the piping on the inlet and outlet sides has adequate support structures so that there are no mechanical stresses that may endanger the Unit.
 - Check the upstream and downstream piping for vibrations. Make sure that the piping to be attached to the Atlantium Unit is anchored and reinforced to protect the Unit against vibration. A high vibration level can cause damage to any hydraulic system, including the Atlantium unit. High vibration can be caused by an unbalanced pump or by sudden valve close.
- **Hydrodynamics**
 - Water hammer can cause damage to any hydraulic system, including the Atlantium Unit. Make sure that this phenomenon does not occur in your facility's water line. To prevent water hammer, consult your system engineer and check your facility system procedures, including:
 - ◆ When starting the water flow when the lines are empty, keep valves open so that the air in the pipes has a simple release pathway.
 - ◆ Sudden valve closures can cause water hammer. Make sure that valves close gradually, enough to avoid this problem.
 - ◆ Ensure that all pumps that impact the Atlantium system employ soft start-up procedures.
 - ◆ The Atlantium Unit must be totally filled with water. Assure that no air can be trapped in the unit and that air can be released. Verify through the Unit's viewport after installation that there are no bubbles.

3.1.3 Flow Data

- Evaluate your flow trends to determine whether you require a flow meter or flow switch. If the flow varies, a **flow meter** is required to detect and report on the flow coming into the unit. Make sure that there are to be **no** branches on or off the pipes between the flow meter and the Unit inlet. If the flow rate is static, a **flow switch** can be used instead.

3.1.4 Application

- Verify that the dose-related parameters, such as the UVT and the flow, are the same as those defined in the Atlantium application scope of supply.
- Determine what a low flow situation means to your process and whether you need to shut down the Unit (low flow indicates upstream problems) or recirculate (low flow normal) when the flow goes below the normal range.

3.1.5 Feed Water Quality

If the water entering the Atlantium Unit contains debris or particles in suspension, pre-treatment (e.g. filtration) may be required to maximize UV exposure and protect internal parts from blockage or damage. Consult with your Atlantium representative.

3.2 Typical Installation Set-Up

Use the diagram below as a basis for your installation drawings. Vertical installation with upward flow is preferred where it is possible and accessible, as it prevents the accumulation of air pockets. If horizontal installation is required, be sure to include a 5 degree slope (recommended/minimum) in the direction of flow to reduce the potential for air pockets. Be sure to include service access as you fit the Atlantium system into your facility (i.e., nearby pipes, electrical fixtures, support beams, etc.)

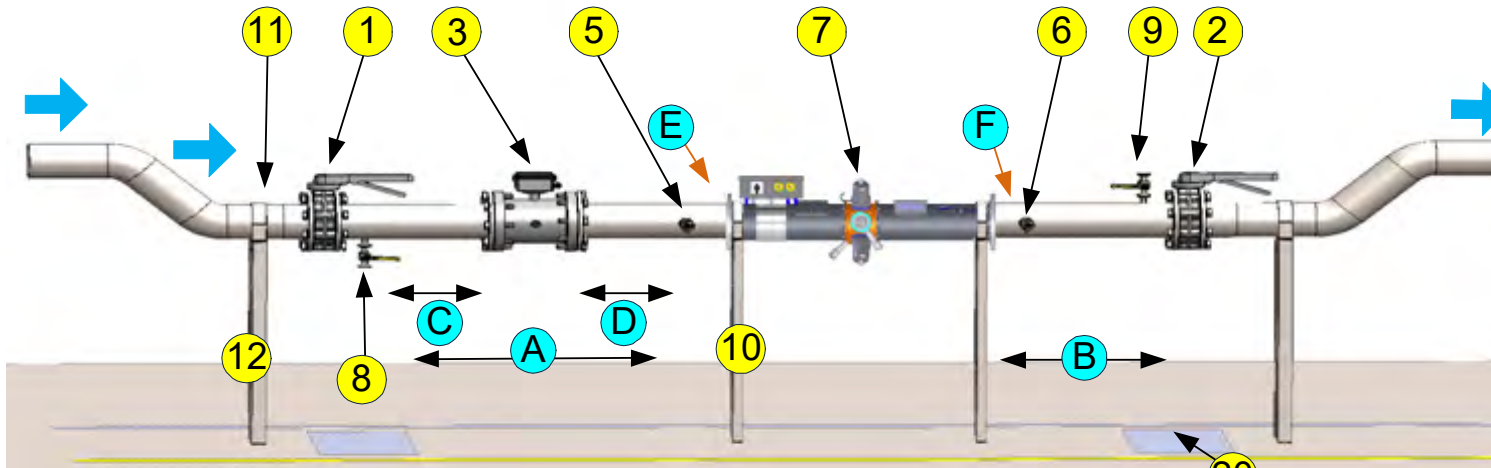


Figure 3-1: Generalized Atlantium system setup, horizontal (no bypass)

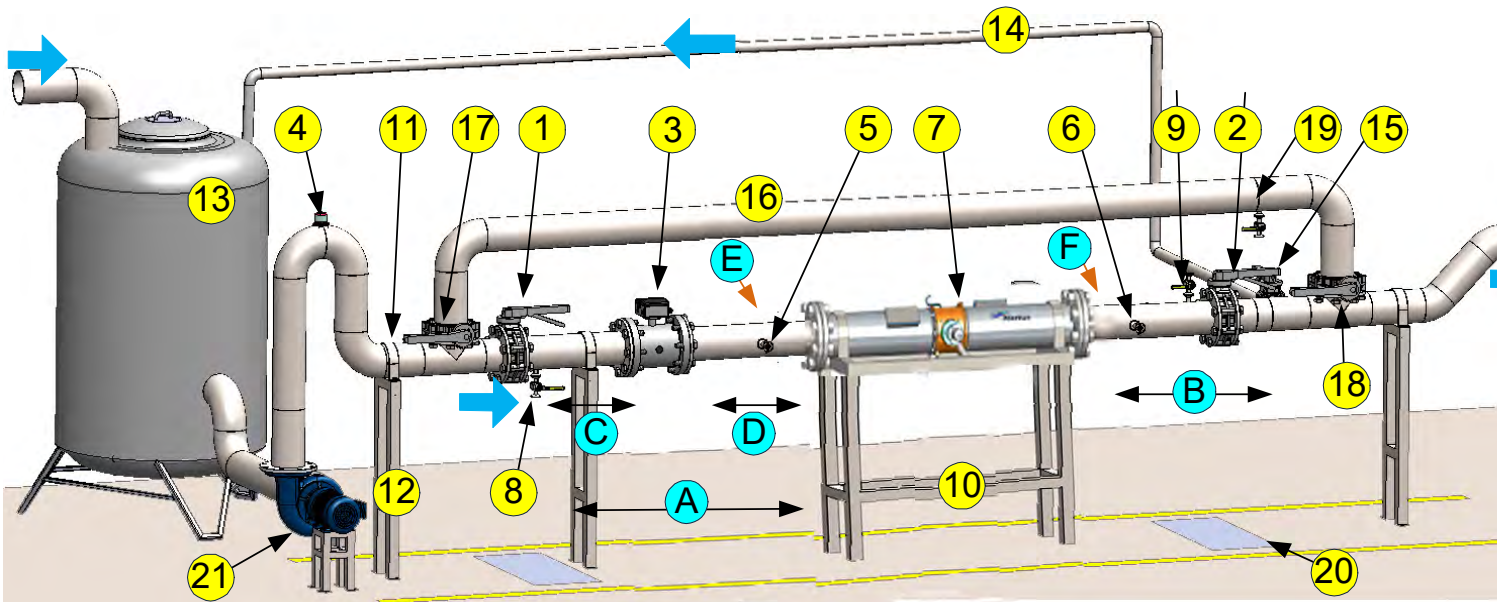


Figure 3-2: Generalized Atlantium system setup, horizontal (with bypass)

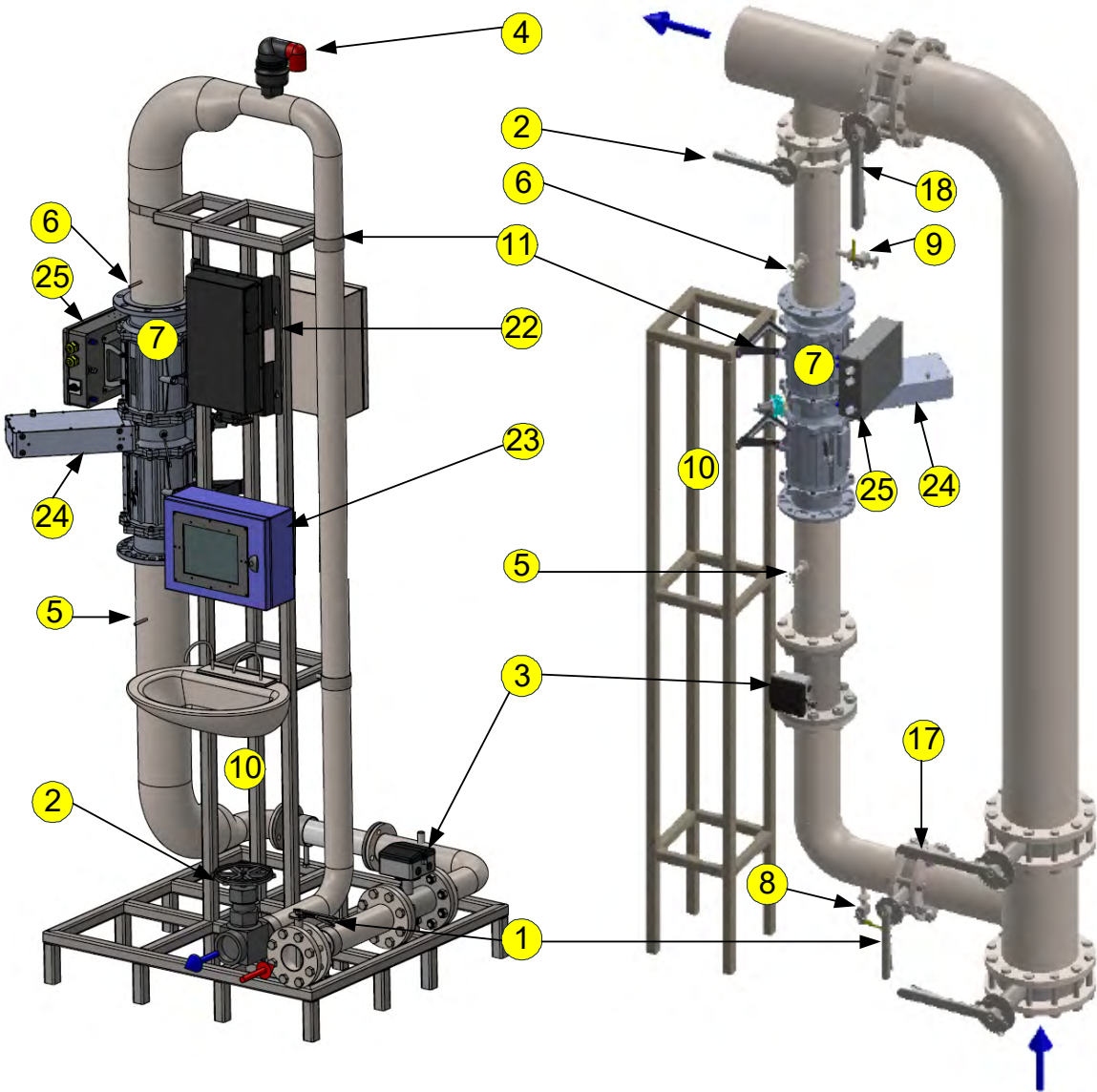


Figure 3-3: Generalized Atlantium system setups, vertical - Left: no bypass, Right: with bypass

Table 3-1: Typical Atlantium System Component Setup Key







#	Description		Atlantium P/N or recommended and available at Atlantium
	Direction of water flow in the pipes		-
1	Inlet isolation Valve ■ Isolating Valve on the Inlet side		-
2	Outlet isolation Valve ■ Isolating Valve on the Outlet side		-
3	<ul style="list-style-type: none"> ■ Flow Meter flow measurement device with 4-20mA analogue output signal ■ To be installed on the same line as the Atlantium system, with no branching before or after the flow meter ■ Follow the manufacturer's Installation instructions 		Available Flow Meters: KROHNE OPTIFLUX 6000 KROHNE OPTIFLUX 2300
4	Air Release valve - To prevent air bubbles where necessary <ul style="list-style-type: none"> ■ Automatic Air Release valve is used to release air bubbles trapped within the line ■ Install at a high position to allow air bubbles to accumulate and release from this point 		-
5/6	Inlet/Outlet Sampling Points <ul style="list-style-type: none"> ■ Position aseptic sampling valves horizontally (90°) on the pipe center, within 50cm of the Unit ■ Aseptic sampling valve must be a dedicated valve for sampling only and resistant to alcohol and flame 		<ul style="list-style-type: none"> ■ Aseptic Sampling Valve Kit for Stainless Steel Pipe - KTB005700 ■ Aseptic Sampling Valve Kit for Plastic Pipe - KTB0011500
7	Generic Atlantium Unit (shown with flange interface. Systems are also supplied with ferrule interface.) (RZ104-11 is shown. The piping and placing of components are similar for RZ104-12.)		-
8	Draining/CIP Port - For performing CIP on the Atlantium Unit <ul style="list-style-type: none"> ■ The Draining port should be positioned close to the Inlet valve and between that and the Unit, on the bottom of the pipe ■ It is also used as one of the CIP ports and connects to a hose 		<ul style="list-style-type: none"> ■ CIP Kit - SAB012900 ■ CIP Valve Kit for Stainless Steel - KT0011600 ■ CIP Valve Kit for Plastic - KT0011700
9	CIP Port - For performing CIP on the Atlantium Unit <ul style="list-style-type: none"> ■ The CIP port should be positioned between the Unit and the Outlet valve, on top of the pipe, at the highest point before the isolation valve, in order to allow the pipes to be completely filled with solution 		(the valve itself is not part of the kits) See CIP Ports and CIP Kits on page 32., for information on CIP equipment.

Table 3-1: Typical Atlantium System Component Setup Key



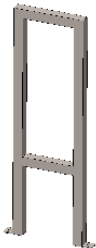

#	Description		Atlantium P/N or recommended and available at Atlantium
10	<p>System Supports</p> <ul style="list-style-type: none"> Supports are required to assure no mechanical stress on the Atlantium Unit 		-
10A	Shim, block or higher downstream support, to achieve 5° slope in horizontal installation		supplied by customer
11	<p>Support brackets</p> <ul style="list-style-type: none"> Brackets are used to hold the Atlantium Unit and pipes attached to the support mounts Is to include internal flexible material to absorb vibrations and assure that the pipes and Atlantium Unit are mounted tightly and securely 		-
12	<p>Pipe Supports</p> <ul style="list-style-type: none"> Pipe Supports are required to assure no vibrations in the pipeline 		-
13	Water tank		-
14	<p>Recirculation Line >5m³/h (>20gpm (Optional)</p> <ul style="list-style-type: none"> A Recirculation line is highly recommended to keep water flowing constantly. 		-
15	Recirculation Line Isolation valve (Optional)		-
16	<p>By-Pass (Optional)</p> <ul style="list-style-type: none"> If the facility uses quartz corrosive CIP chemicals, such as caustic soda, use a By-Pass line to prevent damage to the Atlantium Unit 		-

Table 3-1: Typical Atlantium System Component Setup Key



#	Description		Atlantium P/N or recommended and available at Atlantium
17	By-Pass Inlet isolation Valve (Optional)		-
18	By-Pass Outlet isolation Valve (Optional)		-
19	By-pass draining port (Optional) <ul style="list-style-type: none"> The Draining port should be positioned on the bypass line, at the lowest point of the pipe 		-
20	Drain <ul style="list-style-type: none"> It is recommended to install a drain in the floor, close to the draining valve 		-
21	Pump <ul style="list-style-type: none"> To prevent water hammer, the pump must be able to start up gradually. 		-
22	Ballast Module (certain Atlantium systems)		
23	Control Module		
24	DPM cleaning system (certain Atlantium systems)		
25	Connection Box		

Table 3-2: Typical Atlantium System Distances Setup Key

#	Description
A	<ul style="list-style-type: none"> The pipe between the Inlet isolation valve and the Atlantium Unit should be straight and horizontal. For most applications, a minimum 10D (1000mm/ 40inch) of straight horizontal pipe is needed between the Inlet isolation valve and the Atlantium Unit. For Power Plants, and other applications with space constraints, consult an Atlantium Application Engineer to find appropriate solutions.
B	<ul style="list-style-type: none"> The pipe between the Atlantium Unit and the Outlet isolation valve should be straight and horizontal. For most application, a minimum 5D (500mm/20.inch) of straight horizontal pipe is needed between the Atlantium Unit and the Outlet isolation valve. For Power Plants, and other applications with space constraints, consult an Atlantium Application Engineer to find appropriate solutions.
C	<ul style="list-style-type: none"> Some manufacturers require positioning the Flow Meter at a minimum of 5D (500mm/20.inch) of straight horizontal pipe immediately preceding it on the Inlet side. Refer to the manufacturer's instructions.
D	<ul style="list-style-type: none"> Some manufacturers require positioning the Flow Meter at a minimum of 2D (200mm/11inch) of straight horizontal pipe immediately following it before the Atlantium Unit. Refer to the manufacturer's instructions.
E	<ul style="list-style-type: none"> Position the Inlet Sampling Point at a maximum distance of 0.5 meters/1.5ft. from the Atlantium System Inlet.
F	<ul style="list-style-type: none"> Position the Outlet Sampling Point at a maximum distance of 0.5 meters/1.5ft. from the Atlantium System Outlet.

3.3 Electrical Requirements

The electrical infrastructure is to be installed and in place prior to the system's delivery.

For information on the footprint of the components of the Atlantium system, see the section, **About the RZ300 System** on page 11. Use the Electrical ICD provided by Atlantium to help you plan the electrical infrastructure. See also **Power, Voltage and Grounding Requirements** on page 15 and **Connecting the Ballast Module Cables** on page 55.

Take into account:



For locations with 440Y/254 VAC 3~ +PE 50/60HZ
or 480Y/277 VAC 3~ +PE 50/60HZ

The Atlantium System requires a balanced voltage supply (WYE configuration). If you do not have such a connection, you must create an appropriate power feeding using a 1:1 isolation transformer (where the ground is connected to the middle point of the star configuration at the secondary side of the transformer).

- Evaluate the quality of your power and the likelihood of blackout/brownouts, electrical surges or interruptions. Determine if you need power surge protection and or uninterrupted power supply if any.
- To verify that you order the correct lengths for cables (i.e., Cable Harness, power cables, data cable, etc.), measure the distance between the proposed location of the relevant Atlantium components and between them and the Power source.
 - Planning the placement of the Ballast Modules, **Control Module** and the path of the various cables must take into consideration the length of the **Cable Harness** and the other cables. Cables must be placed in a path that does not interfere with passage ways.
 - The power mains connections must be in the vicinity of the Ballast Modules, Control Module.
 - The power cable and connecting plug are to be obtained locally.

- If the location experiences periodic power outages, consider including uninterrupted surge protection devices.
- Prepare cables of sufficient length to connect from the auxiliary equipment (i.e., the flow meter/flow switch, etc.) to the Atlantium system.
- **For Systems Utilizing Seawater** Minimize the corrosion potential of the treated water by ensuring that there is sufficient grounding. Do not leave the Atlantium Unit standing with seawater. Either rinse with fresh water and leave the Atlantium Unit standing with fresh water or empty.

3.3.1 Preparing for the Electrical Wiring to the Mains

You must prepare the elements listed below for connecting the Atlantium system to the mains.



- For preparing all electrical connections, be sure to use the *Electrical ICD* drawing provided to you by Atlantium with this manual. If no electrical drawings were provided please contact your Atlantium representative.
 - Atlantium systems require connection to mains power of 400 to 480 VAC. See *Mains power supply up to 480VAC* on page 15.
-
- Mains system area circuit breaker, according to the total systems' power consumption to be connected to this line. See *Electrical Usage* on page 14.
 - Install the Required Circuit Breakers, as defined in the Electrical ICD.
 - If you intend to lengthen or replace the mains power cable connected to the Atlantium Unit with a longer cable, prepare the cables according to your location electrical distribution system requirements.
- For locations with 400 VAC: 5-wire system that contains 3 phases, Neutral and Ground (The Neutral and Ground are mandatory)
 - For sites with 400VAC 3 phase + Neutral, the Control Module's Mains feeding voltage is 230 VAC (L1 to N or L2 to N or L3 to N).
 - For sites with 440/480VAC 3 phase, the Control Module **cannot** be fed from one phase of the 3 phase supply. The Control Module **must** be connected to a separate mains feeding, which is in the voltage range of 100-240 VAC.

3.4 The Piping Infrastructure

To review how to prepare the infrastructure, read through the typical installation section before you begin and refer to the section, *About the RZ300 System* on page 11.

Install the piping infrastructure before the Atlantium system arrives, but to avoid built-in mechanical stresses perform the final pipe adaptations and welds when the unit is actually situated in its permanent position.

ATTENTION!

- When tightening bolts to connect piping, use a torque wrench to apply correct and uniform torque, according to accepted standards and practices. Guidance for bolt tightening techniques may be found at:

http://www.wermac.org/flanges/flanges_torque-tightening_torque-wrenches.html

- When sealing the flanges/ferrules and gaskets, **do not** use sealing material that contains graphite as it accelerates the corrosive process on stainless-steel components, including those of the Atlantium system.
- Be sure to align the piping on the inlet and outlet sides of the designated location for the Atlantium Unit with the unit to avoid mechanical stress on the Unit.

Be sure to secure the piping around the designated location for the Atlantium Unit so that there is no vibration.

- Be sure to position adequate supports on the piping line needed to hold up and stabilize the process piping on the inlet and outlet side of the proposed location of the Atlantium unit.
 - Determination of support requirements and design should be made by an on-site mechanical engineer.
-

3.5 Flow Measurement/Detection

The Atlantium unit requires a flow signal to calculate the dose and operate properly. The flow signal is a measurement of the actual flow or simply a flow/no-flow indicator. The flow signal is collected from either a flow meter or a flow switch.

- A flow meter is required in facilities where the flow rate is variable for any reason.
- A Flow switch can be used in facilities where the flow is at a fixed, steady rate. In this situation the value of the known steady rate is entered manually into the system Control Module (see ***Configuring the Flow Settings*** on page 87).

The Flow meter or flow switch does not necessarily have to be installed in close proximity to the Atlantium Unit. It may be more remotely positioned, provided that it is located between the water inlet and the Atlantium Unit and there is **no** branching or splitting of the water flow.

ATTENTION!

The Atlantium system cannot be operated when there is no water or no water flow. Any damage caused due to operating the system without water or without water flow invalidates the Atlantium warranty.

3.5.1 Flow Meter

In most cases, a flow meter with a 4-20 mA output is required to measure the flow and automatically adjust the output of the UV system. The flow meter must be able to measure the expected maximum water flow of the specified Atlantium unit. The power source for the flow meter must come from an external source according to the manufacturer's instructions.

ATTENTION!

Be sure to provide the power source for the flow meter as part of the preparations for installing the Atlantium Unit.

Install the flow meter in strict accordance with the instructions supplied by its manufacturer.

Examples of Flow Meters

Flow meters are available from Atlantium, such as:

- **KROHNE OPTIFLUX 6000** flow meter for high-purity water applications
- **KROHNE OPTIFLUX 2300** flow meter – OPTIFLUX 2000 flow meter, includes **KROHNE IFC 300** signal converter

Consult your Atlantium representative.

OPTIFLUX 6000



OPTIFLUX 2300



Figure 3-4: KROHNE OPTIFLUX Flow Meters

3.5.2 Flow Switch

The flow switch tells the Atlantium Unit when water is or is not flowing. The recommended flow switch type features a paddle connected to a Dry Contact micro-switch, with minimum flow sensing of 0.2m³/hr (1gpm), see Figure 3-5.

Install it in a vertical (12:00 o'clock) orientation on top of the pipe. Follow the manufacturer's instructions.



Figure 3-5: Example of Flow Switch

3.6 Sampling Valve Components and Kits

Sampling valve kits are available from Atlantium.

One Accessory kit is required for each Sampling point.

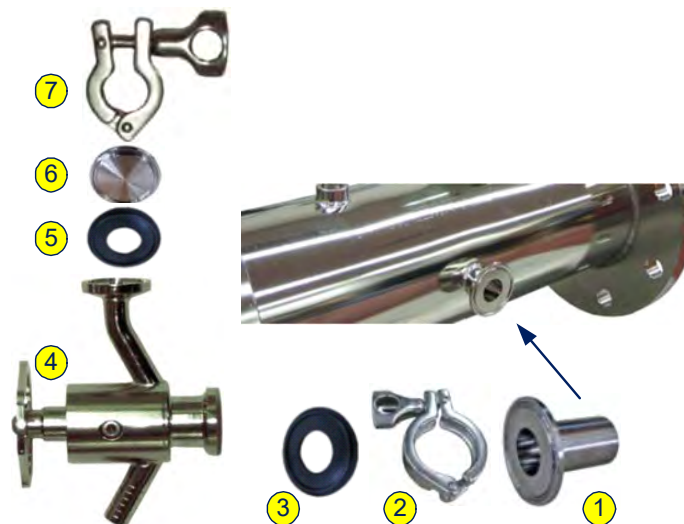


Figure 3-6: Sampling Valve Assembly

The table below details them. For information on installing the Sampling valves, see *Installing the Inlet/Outlet Sampling Points* on page 44.

Table 3-3: Sampling Valve Components and Kits

	Catalog number	Description	Purpose	Image	Kit for Stainless Steel Pipe KTB005700	Kit for Plastic Pipe KTB005750
1	FAC003700	Long welding ferrule 1" Adapter	For welding the tri-clamp port to the pipe		2 Pcs	-
2	FAB008100	Threaded Adapter 1/2" BSP	For connecting the tri-clamp port to the plastic pipe		-	2 Pcs
3	FA0000045	Clamp 1 1/2", ST.ST 304	For connecting the valve to the welded port		2 Pcs	2 Pcs
4	FA0000046	Ferrule gasket 1", FJ31.05-E	For sealing the valve connected to the pipe		2 Pcs	2 Pcs
5	COB000500	Aseptic sampling valve, ST.ST 316L	For taking water samples		2 Pcs	2 Pcs
6	FA0000048	Gasket 1/2", FJ31/25-E	For sealing the valve's flushing port		2 Pcs	2 Pcs
7	FA0000049	Solid End Cap, 1/2", ST.ST 304	For covering the valve's flushing port		2 Pcs	2 Pcs
8	FA00000047	Clamp 1/2", ST.ST 304	For sealing the flushing port of the valve		2 Pcs	2 Pcs
	FA0008300	Round Brush - 15/60/150	For cleaning the valve during the process		2 Pcs	2 Pcs

3.7 Draining Valves

It is important to plan for draining the system. Install one draining valve at the lowest point of the pipeline, before or after the Atlantium unit. If you plan to install CIP ports, one of them can double as a draining valve. If there is a Bypass line used occasionally to bypass the Unit in any circumstance, add an additional draining valve to assure that the bypass line does become a potential source of standing water. A bypass line must be empty when not in use.

3.8 CIP Ports and CIP Kits

The CIP (Cleaning-In-Place) recirculation system is used for the periodic cleaning and sterilization process of the Atlantium unit's inner surfaces and quartz sleeve. The CIP Cart includes a reservoir, a pump and supply and return hoses. See the diagram below and refer to **CIP Cart ICD drawing ICB012900** for further details.

3.8.1 CIP Cart

For systems with 400VAC: catalog number: SAB012900

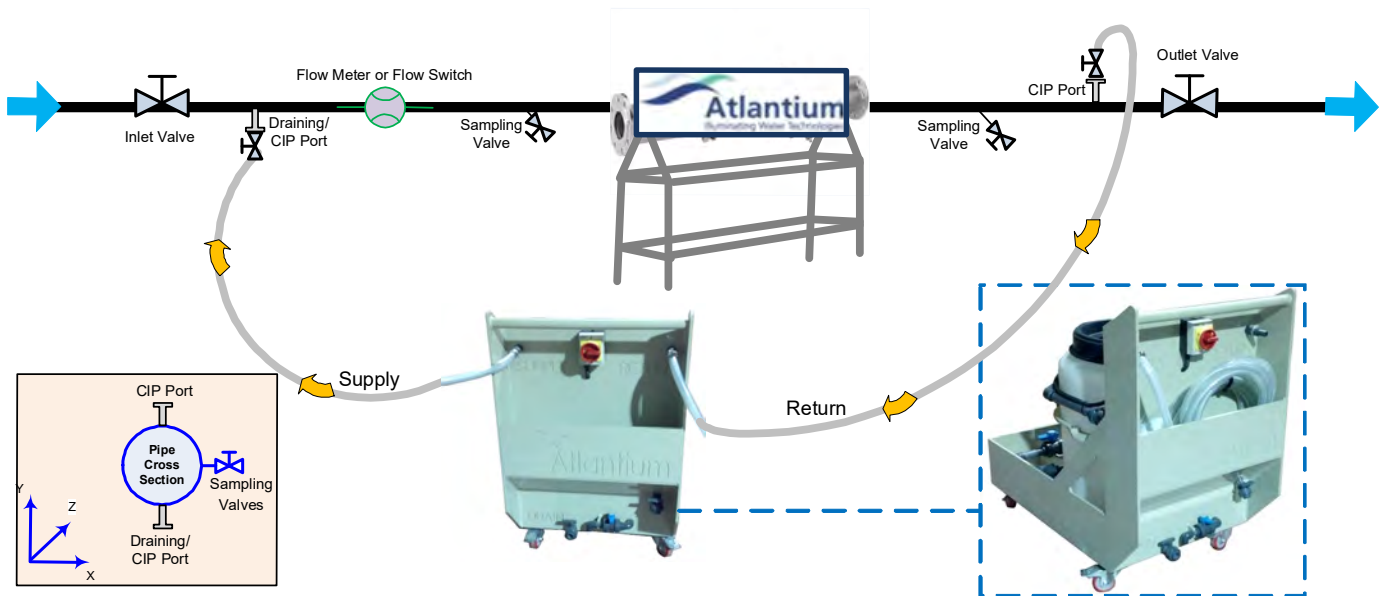


Figure 3-7: CIP Recirculation System Connections

3.9 CIP Accessories and CIP Kits

The CIP (Cleaning-In-Place) recirculation system is used for the periodic cleaning and sterilization process of the Atlantium unit's inner surfaces and quartz sleeve, see Figure 3-7.

Two Accessory kits are required, one for each CIP port.

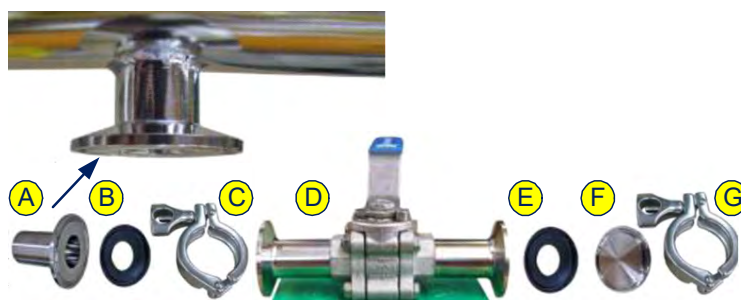


Figure 3-8: CIP Valve Kit

Table 3-4: CIP Accessory Kits







	Catalog number	Description	Purpose	Image	Kit for Stainless Steel Pipe KT0011600	Kit for Plastic Pipe KT0011500
A	FAC003700	Long welding ferrule 1" Adapter	For welding the tri-clamp port to the pipe		2 Pcs	-
A	FAB008100	Threaded Male Adapter 1/2" BSP	For connecting the tri clamp port to the plastic pipe		-	2 Pcs
B,E	FA0000046	Ferrule Gasket 1", FJ31.05-E	For sealing the valve connected to the pipe		2 Pcs	2 Pcs
C,G	FA0000045	Clamp 1.5", ST.ST 304	For connecting the valve to the welded port		2 Pcs	2 Pcs
F	FAC004100	Solid End Cap, 1 1/2", ST.ST 304, EG16A3A 1.54L	For covering the CIP port while not in use		2 Pcs	2 Pcs
D		Valves	Two high-purity chemical resistant brass ball valve (aseptic ball valves), 1 inch diameter, with tri-clamp fitting connection mechanism (A3 Standard) on both sides.		2 Pcs Not Included Purchased by Customer	2 Pcs Not Included Purchased by Customer

Table 3-4: CIP Accessory Kits

	Catalog number	Description	Purpose	Image	Kit for Stainless Steel Pipe KT0011600	Kit for Plastic Pipe KT0011500
	FAB005700	Hose Adaptor 1" to 3/4"	To attach the CIP hose		2 Pcs	2 Pcs

3.9.1 CIP Safety Equipment

Required but not included in Atlantium's CIP Kits: protective equipment such as goggles, clothing and (chemical-safe) gloves, according to the safety standards specified at your facility.

3.10 Connection to Facility Control

Options are available to set up control of the Atlantium system via your facility control system. Control setup can be made via any of the following:

- **Modbus** - RTU on RS485 (network) serial connection directly to the Facility control (Appendix A, **Modbus Communication Protocol** on page 176)
- **Signal control** - utilizing System Ready, External On/Off, and General Alarm functions, etc. (See **Connection Box** on page 56.)

With any of the above control options, you can still utilize the function of the **Control Module** of the Atlantium system. Whichever control facility is utilized, the system communicates to the other control systems such that the last command issued determines the current status.



4 Safety Overview

The Atlantium System has been designed according to the highest safety standards, assuring the safety of operating personnel, the environment and the treated water.

DANGER!

Improper use of controls or adjustments or performance of procedures other than those specified herein could result in significant hazards.

Therefore, personnel operating or servicing this system must be thoroughly familiar with all safety requirements and operating procedures and are to adhere to them during use of this system.



To guard against injury, observe basic safety precautions, including the following:

All persons operating the Atlantium system must be aware of proper use and the potential hazards of violating safeguards. Be certain that all personnel carefully review the safety information and the procedures specified in this manual. Only authorized individuals with appropriate training and knowledge, including local regulations, should operate, assist in the operation of or provide maintenance to the system.

All service and repair of the Atlantium system must be performed by Atlantium field service technicians or other factory-authorized personnel **ONLY.**

4.1 UV Lamp Safety



UV Exposure: The system generates ultraviolet (UV) light within the Unit, which can cause serious eye damage or blindness if you stare at it directly when it is operating. Use the Viewport only. Do not look directly into the lamp enclosure during system operation, examining, or servicing the system's internal components during operation, or when lamp's breather caps are open, or if energized testing is required.

The Viewport is specifically designed with a UV filter to prevent UV light from escaping so it is safe to look inside. Nevertheless, personnel should not stare at it or any other brilliant light source for any but short intervals to check on Unit operations. The Viewport cover should also be preserved intact.

If the viewport is broken, DO NOT look directly into it. Be sure to request a replacement part immediately. Do not open the viewport's metal cover until the replacement is installed.

Persons potentially subject to UV light exposure – technicians who are servicing the Unit – must wear appropriate eye protection whenever the system is operating.

During maintenance procedures that are conducted with the UV lamps turned on:

- Use Caution floor signs at a distance of 1m/40inch from the Atlantium Unit to warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Wear appropriate eye protection, such as containing polycarbonate lens that meet EN1 ultrasonic, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
- **DO NOT look directly into openings that emit UV light.**



Protect Hands: Do not touch the UV lamp with bare hands.

- Wait at least 10 minutes until the lamp is cooled down before touching the lamp or starting the replacement procedure.
- Use appropriate protective gloves both to protect your hands and to avoid skin oils that leave fingerprints and/or harm the UV lamp.
- Lamps can reach a temperature of 1,000C° under operating conditions.
- Wait ten minutes to allow the lamp to cool down fully before replacing it.
- Keep materials that are sensitive to heat, or which contain solvents, a safe distance away from the lamp, Unit, and electrical connections.



Electric Shock: Before replacing a UV lamp or other components, and during any maintenance requiring lamps to be turned off, make sure the the Connection Boxes of the relevant lamps are turned OFF and place a sign on the alerting others NOT to touch the during maintenance so that no one can inadvertently turn it on while maintenance is in progress.

ATTENTION!

Prevent Damage:

Handle the UV lamp assembly by holding only the contact housings (white ceramic casing).

When handling the UV lamp, always place it on a flat surface or table, so that it is not accidentally damaged.

If the body of the UV lamp is touched accidentally, clean the fingerprints off with alcohol (at least 70%) and wipe dry with a soft, clean, lint-free cloth (usually provided with the lamp). Do not use cleaning rags or materials that can leave a residue.

Do not use a UV lamp that shows any scratches, cracks, or other damage.



Mercury Poisoning:

Lamps contain mercury, which is a hazardous substance. Always wear gloves and safety glasses when handling or replacing a UV lamp.

Inhalation of vaporized mercury compounds can be harmful to the lungs, kidneys, and nervous system. Mercury that penetrates the skin or is ingested can also be harmful.

If mercury is inhaled, penetrates the skin, or is ingested accidentally, seek emergency medical treatment immediately.

If a UV lamp breaks during handling and releases mercury, the following precautions should be observed to minimize the risk of exposure to mercury:

- Always wear gloves and safety glasses when handling or replacing a UV lamp.
- Leave the area immediately to avoid inhalation of the mercury vapor.
- Thoroughly ventilate the area for at least 30 minutes or until the mercury vapor concentration is in compliance with applicable federal and local health and safety regulations.
- After handling a broken UV lamp, carefully remove gloves, and then wash hands thoroughly with soap and water. Follow all applicable federal and local health, safety, and environmental regulations.
- Do not turn on or operate the system until all mercury contamination has been cleaned up and removed.
- Establish a Hazard Response Plan to deal with all related hazards and provide it to all personnel associated with the Atlantium system.

Refer the Chemical Safety information for mercury at: <http://www.inchem.org/documents/icsc/icsc/eics0056.htm>

ATTENTION!

Lamp Compatibility:

Use original Atlantium UV lamps ONLY. Other lamps are incompatible. They void the warranty and may damage the system.

Proper Disposal of Lamps

Expired lamps are classified as hazardous waste and must be disposed of appropriately.

- A non-ruptured UV lamp that is no longer used must be disposed of according to specific local or federal environmental and hazardous waste regulations.
- Broken lamps and parts contaminated by the mercury have to be vacuum-packed and disposed of. Broken lamps, as well as contaminated packing material and other parts have to be considered as special waste, which may only be removed by authorized waste disposal companies.

4.2 Electrical Hazards and Safety Considerations

DANGER!

UNDER NO CIRCUMSTANCES

SHALL ELECTRICAL WORK BE CARRIED OUT WITHOUT VERIFYING THAT ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINE FEEDING THE ATLANTIUM SYSTEM COMPONENTS ARE SET TO THE **OFF** POSITION AND THAT **NO** ELECTRICAL FEED IS LIVE.



DO NOT SET ANY MAIN CIRCUIT BREAKER OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS TO THE ON POSITION UNTIL **ALL** ELECTRICAL WIRING IS PROPERLY CONNECTED. UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.



- **DO NOT DRILL INTO THE CONNECTION BOXES OR ALTER THEM IN ANY WAY!!!!**
- The Connection Box already contains entry glands for **ALL** of the cabling needs.
- Making holes in a Connection Box will destroy its waterproof seal, endangering the components inside.
- Do Not draw electricity from the Atlantium Unit's Connection Box as it will damage the Unit's electrical configuration.



The Atlantium Hydro-Optic system incorporates high-voltage internal components, which can cause serious injury or fatal electrical shock if not used or serviced properly. High voltage components can retain a charge for some period of time even after the system has been turned off.



- Never attempt to remove any system covers or to dismantle any parts, except when performing the maintenance procedures detailed in **System Maintenance** on page 99.
- No portion of the Atlantium system is to be opened or removed by anyone other than a trained and authorized technician.
- Do not spray or pour any type of fluid directly into the Unit or electrical components. Moisture causes damage to the equipment and electrical shock may result.
- Do not operate the system if the power cables or harnesses are frayed or otherwise damaged.

CAUTION!



DO NOT enter **Technician Mode** in the **Control Module** unless instructed to do so by Atlantium certified personnel or by an Atlantium System User Manual, for a specific task.

If you are in Technician Mode, **DO NOT WALK AWAY!**



NEVER LEAVE THE ATLANTIUM SYSTEM WHEN IT IS OPERATING IN TECHNICIAN MODE!!

A SYSTEM LEFT IN TECHNICIAN MODE WITHOUT SUPERVISION CAN RESULT IN PERMANENT DAMAGE!!



Utilize best practices regarding electrostatic discharge (ESD).

Avoid direct contact with the electronic circuit boards of the **Control Module**, which is sensitive to electrostatic discharge (ESD).

Wear an electrostatic discharge (ESD) Wrist Strap when performing procedures where contact with a circuit board is possible.

4.3 Keep the Unit Full of Water

ATTENTION!

The Atlantium system cannot be operated when there is no water. Any damage caused due to operating the system without water invalidates the Atlantium warranty.

4.4 Chemical Use for Cleaning in Place (CIP)



ATTENTION!

- The chemicals selected and the concentrations used must be approved by Atlantium's Application staff, and the ship's quality assurance and safety officials. The CIP process must comply with the written protocols and procedures set in place by those departments. Refer to the section, ***Selecting the Correct Chemicals for CIP*** on page **100**
- Use and handle all chemicals in strict accordance with their manufacturer's instructions, product information sheets, and Safety Data Sheets (SDS).
- NaOH (Caustic Soda) as it causes irreversible damage to quartz. It is strictly forbidden to use it without a specific analysis of temperatures, concentration, frequency and duration and written approval from Atlantium's application engineer.

Refer to the Chemical Safety information provided with the CIP chemicals which you choose to use, for example:

<https://portal.ecolab.com/servlet/PdfServlet?sid=915373&cntry=AU&langid=en-GB&langtype=RFC1766LangCode&locale=ja&pdfname=OXONIA+ACTIVE+150>

4.5 Anti-Corrosion Spray Safety

WARNING!

When using OKS 2101 Spray:

Refer to the OKS 2101 Safety Data Sheet according to Regulation (EC) No. 1907/2006 - GB.

Use the following protective gear:

- Safety glasses with side-shields conforming to EN166
- Protective gloves that satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it
- Respiratory protection mask with filter type A-P

Follow these precautions for safe handling:

- Do not use in areas without adequate ventilation.
- Do not breathe vapors or spray mist.
- In case of insufficient ventilation, wear suitable respiratory equipment.
- Avoid contact with skin and eyes.
- Keep away from fire, sparks and heated surfaces.
- Persons with a history of skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
- Smoking, eating and drinking should be prohibited in the application area.
- Wash hands and face before breaks and immediately after handling the product.
- Do not get in eyes or mouth or on skin.
- Do not get on skin or clothing.
- Do not ingest.
- Do not use sparking tools.
- These safety instructions also apply to empty packaging which may still contain product residues.
- Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.



4.6 System Safety Features

The Atlantium Hydro-Optic system includes the following safety features:

4.6.1 UV Protective Seal



Each lamp is enclosed within a sealed lamp chamber that prevents the UV light from escaping. This means that with regular operation there is no ambient UV escaping from the Unit.

While servicing the UV Unit or checking the Intensity sensor, UV blocking safety glasses should be worn by service staff or others working in the area to prevent exposing the eyes to the UV light.

4.6.2 Software Safety Controls on Control Module



CAUTION!

When the system is started, the Atlantium software performs a series of internal self-testing routines prior to starting system operation.

If the system **does not** pass these tests satisfactorily, UV lamp operation is disabled until the problem is resolved.

If problems arise during normal operation, appropriate error messages with varying levels of severity are generated on the touch-screen of the Control Module.

Control Module screens that provide setup options and compliance reports are password protected.

ATTENTION!

Control Module has 3 levels of user permission hierarchy (**see Table 7-2**):

- **No User** - enables view of system status screens only
- **Operator** - enables general and maintenance actions
- **Manager** - enables full system settings

All changes in the system settings are logged and tracked in the Settings Report.

DO NOT leave the Control Module unattended, even for a short time, while setting change screens are accessible. An untrained person could damage the operation of the Atlantium system by making unauthorized setting changes.

4.7 Atlantium Training

As part of the Commissioning and Hand-Off process, Atlantium provides hands-on training on all aspects of the Atlantium system for your designated personnel. Should any component be replaced with upgraded features, Atlantium offers training as needed and is ready to provide additional training for new personnel or any other needs related to its systems.



5 Installing the Atlantium System

This section provides details about Installation the Atlantium system.



For preparing all electrical connections and mechanical installation, be sure to review the electrical and mechanical Interface Control Drawings (ICD) provided to you by Atlantium with this manual. If no electrical drawings were provided, please contact your Atlantium representative.

5.1 Installation Overview

Hardware setup to be implemented by your facility personnel:

- Phase 1** Unpacking and checking the contents of the Atlantium system packaging (See below)
- Phase 2** Installing Sampling valves and CIP ports (See page 43)
- Phase 3** Positioning the Atlantium Unit and connecting to the Piping Infrastructure (See page 47)
- Phase 4** Mounting the **Control Module(s)**, Ballast Module(s), etc. (See page 50)
- Phase 5** Cabling the **Control Module(s)**, Ballast Module(s), etc. (See page 55)

Commissioning to be implemented by Atlantium personnel:

- Phase 6** Starting up the system (See page 78)
- Phase 7** Configuring the **Control Module** (See page 69)
- Phase 8** Tuning the System (See page 120)
- Phase 9** Completing the System Setup and Testing (See page 103)

The Installation Process Flow diagram below maps out the installation process.

5.2 Installation Process Flow Diagram

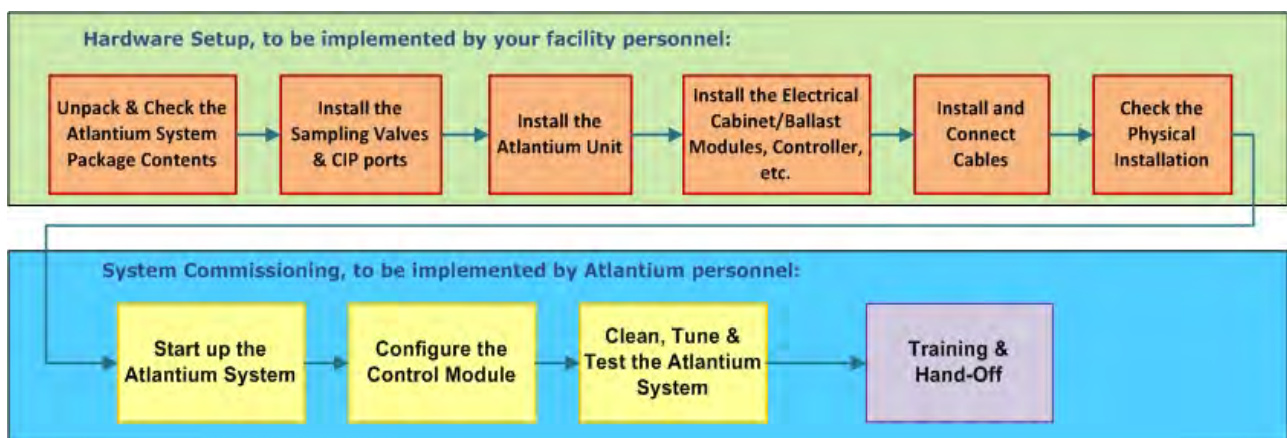


Figure 5-1: Installation Flow Diagram

5.3 Setting the Main Circuit Breakers to OFF Position

Before beginning work to connect the wires/cables of the Atlantium system components, turn the main circuit breakers of the electrical lines feeding

the Atlantium system components to the **OFF** position. **Verify that no electrical feed to the Atlantium system components is live.**



DANGER!

UNDER NO CIRCUMSTANCES

SHALL ELECTRICAL WORK BE CARRIED OUT WITHOUT VERIFYING THAT ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS ARE SET TO THE OFF POSITION AND THAT NO ELECTRICAL FEED IS LIVE.

DO NOT SET ANY MAIN CIRCUIT BREAKER OF THE ELECTRICAL LINES FEEDING THE ATLANTIUM SYSTEM COMPONENTS TO THE ON POSITION UNTIL ALL ELECTRICAL WIRING IS PROPERLY CONNECTED. UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.

5.4 Unpacking and Checking Package Contents

The Atlantium system is packaged and shipped in specially packed crates that contain:

- The Atlantium UV Unit
- Ballast Module(s)
- Control Module
- Ultrasonic Cleaning Module for Ultrasonic Cleaner
- if included)
- Documentation
- Peripheral accessories as per your order and listed on your delivery documents are crated according to their size and weight. Small accessories may be crated together.

Each of the crates is connected to a forklift-friendly wooden pallet. The Atlantium crates must be lifted off the transport vehicle using a forklift or crane controlled by a qualified operator.

➞ **To unload and check the system:**

- Step 1.** Using the forklift or crane, lift each of the crates off the transport vehicle and lower them to a level ground surface.
- Step 2.** Walk around and inspect each crate for damage. Note if there is any separation in the joints or any other indication of any damage in transit. If there is any indication of damage, take a photograph of it and use extra caution when proceeding to the next step.
- Step 3.** Unclamp and remove the panels of the crates.
- Step 4.** As you remove the wrapping and shipping protections, verify that the contents of the crates are correct according to the delivery documents. The Atlantium Unit contains a plate with the model number and other product information. Verify that the correct product version is supplied.



- Immediately report to Atlantium and to the insurance carrier any damage to the crates or to the Atlantium system found before opening the crates or during every step of unpacking, installing or testing of the system.
- If you ordered more than one Atlantium system, check the serial numbers against the delivery documents to verify which components comprise each individual system.

5.5 Installing Sampling Points and CIP/Draining Ports

Both the Sampling Points and CIP/Draining Ports must be installed on the inlet and outlet sides of the Atlantium Unit.

5.5.1 Installing the Inlet/Outlet Sampling Points

Aseptic sampling valves are to be located indoors in clean environment without away from direct contact with fan or A/C air flow. They each must be a dedicated valve for sampling only and resistant to alcohol and flame. For information on the Sampling valve's components, see *Installing Sampling Points and CIP/Draining Ports* on page 43. See *Taking Microbial Samples* on page 95. for information on using the Sampling valves.

On the inlet and outlet sides of the water line, connect the aseptic sampling valves.

➔ To install an inlet/outlet sampling point:

Step 1. On the Inlet side, install the **Long welding ferrule** or **threaded male adapter (1)**.

- Position aseptic sampling valves (1 & 2 in Figure 5-6, on page 46) horizontally (90°) on the pipe center, within 50cm of the Unit.

■ For Stainless Steel Pipes:

- Weld the 1 inch **ferrule (1)** clamp fitting at a horizontal orientation (3 or 9 o'clock).

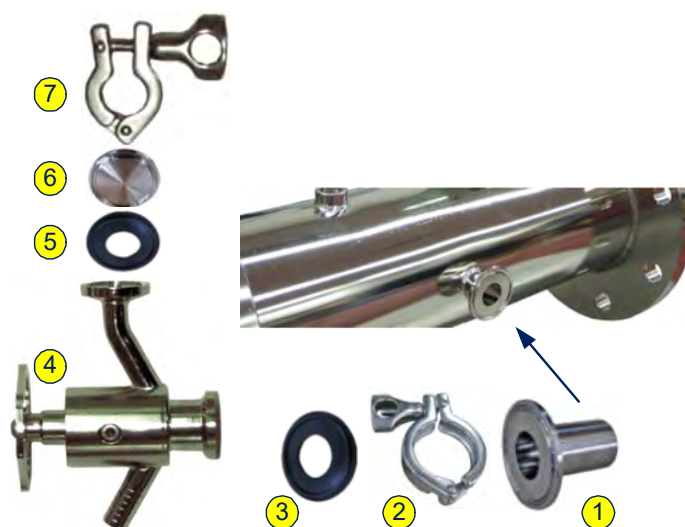


Figure 5-2: Sampling Valve Assembly

- Perform a polishing process to achieve a smooth area on the external and internal part of the pipes.
 - Passivate the pipes to avoid corrosion.
 - **For Plastic Pipes:**
 - Thread the **male adapter (1)** clamp fitting to the port.
 - Repeat for the Outlet side sampling point.
- Step 2.** Fit the gasket (3) into the **welding ferrule or threaded male adapter (1)**.
- Step 3.** Fit the aseptic **sampling valve (4)** on over the gasket (3).
- Step 4.** Fit the clamp (2) around the aseptic **sampling valve (4)/gasket (2)/welding ferrule or threaded male adapter (1)** and close and lock it.



Figure 5-3: The clamp is placed around the aseptic **sampling valve /gasket /welding ferrule or threaded male adapter**

Closing Off the Aseptic Sampling Valve When Not in Use

- Step 5.** Into the spout of the sampling valve, fit the 1/2" gasket (6) and fit the cap (7) over it.
- Step 6.** Fit the 1/2" clamp (5) around the sampling valve spout/gasket (6) /cap (7) and close and lock it.



Figure 5-4: The clamp is closed



Figure 5-5: The clamp is closed

5.5.2 Installing the CIP/Draining Ports

The CIP (Cleaning-In-Place) recirculation system is used for the periodic cleaning and sterilization process of the Atlantium unit's inner surfaces and quartz sleeve. For more information on performing CIP, see **Cleaning In Place (CIP)** on page 95.

A CIP KIT includes the CIP Cart with water reservoir and a pump, capable of pumping up to 4m³/hr (17.6gpm). It includes a supply hose and a return hose, both with ID 19mm (0.75") and length 5m (15 feet) stored in a convenient pocket. See the diagram below.

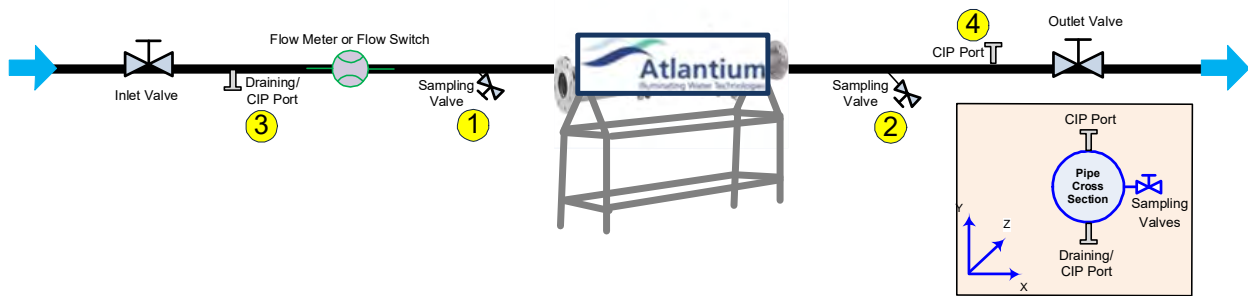


Figure 5-6: CIP Ports and Sampling Valves Orientation

Position the CIP/draining valves (**3 & 4**) on both the inlet and outlet sides of the Atlantium unit. To enable connection of the CIP kit, use high-quality, sanitary equipment, including a 1 inch tri-clamp/ferrule on both sides. A CIP/Draining valve is to be located 1D after the Inlet valve and 1D before the Outlet valve. When not using the CIP ports, close the valve outlet using the tri-clamp cover.

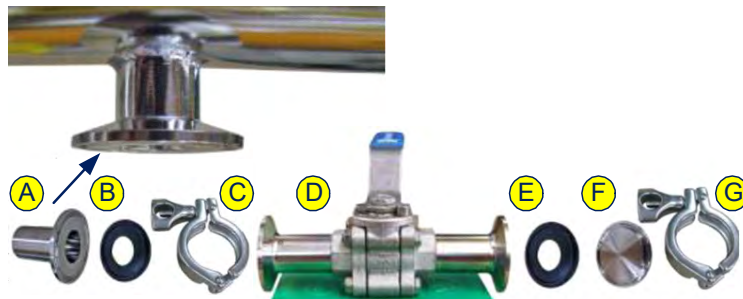


Figure 5-7: CIP Valve Kit



For preparing all electrical connections and mechanical installation, be sure to review the electrical and mechanical ICD drawings provided to you by Atlantium with this manual. If no electrical drawings were provided, please contact your Atlantium representative.

➡ To install the CIP ports:

Step 1. Weld or thread the 1" ferrule at a vertical orientation:

For municipal applications, prepare 1" screw ports for the valves and insert the valves:

- **Draining Valve:** at a 6:00 o'clock orientation on one side of the Atlantium unit.
- **CIP Valve:** at a 12:00 o'clock orientation on other side of the Unit.

For all application except municipal:

■ For Stainless Steel Pipes:

Weld the 1" clamp fittings:

- **Draining port:** at a 6:00 o'clock orientation on one side of the Atlantium unit.
- **CIP port:** at a 12:00 o'clock orientation on other side of the Unit.
- Perform a polishing process to achieve a smooth area on the external and internal part of the pipes.
- Passivate the pipes to avoid corrosion.

■ For Plastic Pipes:

- Thread the clamp the valve fittings to the port..

Attaching the Valve to the ferrule

Step 2. Fit the gasket (**B**) into the **welding ferrule** or **threaded male adapter (A)**.

Installing the Atlantium System

Step 3. Fit the aseptic **valve (D)** on over the gasket **(B)**.

Step 4. Fit the clamp **(C)** around the aseptic **valve (D)**/gasket **(B)**/welding ferrule or **threaded male adapter (A)** and close and lock it.

Closing Off the CIP/draining Ports When Not in Use

Step 5. Into the ferrule, fit the gasket **(E)** and fit the cap **(F)** over it.

Step 6. Fit the clamp **(G)** around the CIP port/gasket **(E)** /cap **(F)** and close and lock it.

Preparing the CIP Hoses

Step 7. On one end of a hose **(A)**, using an appropriate screwdriver, loosen the band **(C)**.

Step 8. Connect the hose to one of the adapters on the cart **(B)**. Push the hose up a far as you can.

Step 9. Using the screwdriver, tighten the band **(C)**.

Step 10. On the other end of a hose **(D)**, using an appropriate screwdriver, loosen the band **(F)**.

Step 11. Connect the hose to one of the hose adapters **(E)**. Push the hose up a far as you can.

Step 12. Using the screwdriver, tighten the band **(F)**.

Step 13. Repeat with the second hose to the adapter on the other side of the cart.

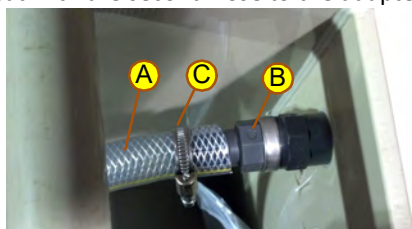


Figure 5-8: Hose Connection to One Side of Cart

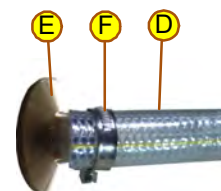


Figure 5-9: Hose Connection to Hose Adapter

5.6 Positioning the Atlantium Unit

Read through this typical installation section *before* you begin.

Make sure to use your installation drawing during this procedure. The **RZ104** does not include support brackets. Appropriate supports must be installed along the piping on both sides of the **RZ104** Unit to ensure that it is anchored and stable.

Trace the path to be taken to position the Unit to its planned location and clear it of all obstacles.

In general, Atlantium systems can be installed horizontally or vertically in your piping system. Vertical installation of the Atlantium unit and piping, with an upwards direction of flow, is the preferred configuration for installation, where this is possible.

If mounting the unit in a horizontal configuration, a slope of at least 5 % is recommended to minimize the risk of air pockets developing or remaining trapped in the Atlantium unit. The Customer is to supply the mechanical means for ensuring this slope (see Figure 3-1 on page 22). For a vertical installation, the Atlantium Unit can be positioned against a wall or on skids.

5.6.1 Required Equipment

Supply the following tools and equipment:

- Bolts, washers & lock washers
- Supports for inlet/outlet piping and for the Unit as shown on your installation plan

➤ To position the Atlantium unit:

- Step 1.** Note the direction of the water flow that is to occur in the piping process into which you intend to place the Atlantium Unit and the Flow indicator marked on the unit. Use this information to decide at which angle to lift the Unit for transport. This is to help you to prepare for placing the Unit at the location.
- Step 2.** To lift the Unit from its packing crate, securely attach lifting straps **(1&2)(2)** to around through the lifting support rings **(1)** at the end fittings **(1)** on each end of the Unit.
- Step 3.** Join the straps together **(1&2)** with a third central strap **(3)** that is secured to the lift or crane **(4)**. **(4)**--

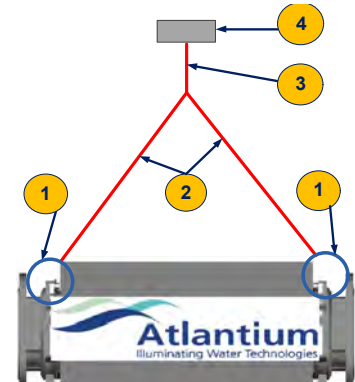


Figure 5-10: Lifting Strap Locations

- Step 4.** Ensure that all straps are connected securely to the Unit, to each other and to the lift/crane.
- Step 5.** Using the lift/crane, lift the Unit by the straps, out of the crate and position it for safe transport (near-ground level is preferred).
- Step 6.** Using the lift/crane and the designated person to guide, carry the Unit to its intended location.
- Step 7.** At the designated locating, check the installation plan, including the minimum height of the Unit from the floor. Ensure that the Unit is placed so that the Connection Boxes **(B)** are in a parallel position **(A)** vis a vis the floor **(C)** and that the Connection Boxes on the top are level. See the diagram below. For a vertical installation, **C** in the diagram below represent the wall or skid.

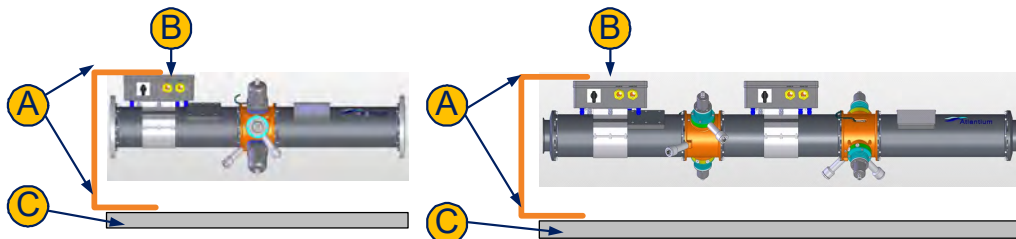


Figure 5-11: Placement of the **RZ104** Unit vis a vis the floor, wall or skid



The **RZ104** does not include support brackets. Be sure to install appropriate supports along the piping on both sides of the **RZ104** Unit to ensure that it is anchored and stable.

- Step 8.** Install the Atlantium Unit:

Horizontal Installation

- Carefully lower the Unit to its position.
- Using the appropriate bolts, washers and lock washers, bolt the triangle support brackets to the customer-provided corresponding supports.

For Vertical Installation

Position the Atlantium Unit vertically so that the Flow label is pointing upwards:

- c Carefully lower the Unit to its position.
- d Using the appropriate bolts, washers and lock washers, bolt the triangle support brackets to the customer-provided corresponding supports.



Figura 5-12: Etiqueta Flow

5.6.2 Connecting to facility piping

Step 1. To connect the fitting on one side of the Unit to the fittings of the facility's pipes, insert a gasket between the Unit's and the facility's pipes. In some cases, a reducer or expander may be necessary.

- For systems with flange interface, on one side of the Unit to the flanged fittings of the facility's pipes with eight appropriate (8) sets of bolts/nuts/flat and lock washers - do not tighten the hardware.
- For systems with Tri-Clamp fittings, on one side of the Unit, clamp the fittings together - do not tighten the hardware.

Step 2. Repeat the step above for the other side of the Unit.

Step 3. Tighten the fastening hardware so that the torque pressure around the fittings is even, and the Unit is firmly connected to the facility's water line.

Step 4. For installations with multiple units, repeat this procedure for the second unit.

Step 5. To check for any leakage, open the Inlet and Outlet valves to allow water to flow through the newly installed Unit and its surrounding process piping.

Step 6. If you find any leakage, tighten the connections.

Step 7. Close the Inlet and Outlet valves and use the Draining valve, drain the Atlantium system piping from Inlet valve to Outlet valve.



Figure 5-13: Generic Tri-Clamp Fitting

5.7 Installing Surge Protection

Verify that you have a protective device that prevents electrical surges and fluctuations from causing damage. You must install at least one of these two types of surge protection:

- UPS (Uninterrupted Power Supply) has an internal battery that allows the equipment plugged into it to continue to run in the event of a power outage until power is restored. It also has the benefit of performing the same functionality of surge protectors, protecting against spikes and surges. If needed, the UPS allows the system to be shut down cleanly if power is out for a lengthy period.
- Surge protection device that protects your equipment from variations in electrical current, such as surges and spikes.

The diagram to the right shows the generic wiring for a surge protection device. See the manufacturer's installation instructions with the surge protection device to be installed. For more information about surge protection devices available via Atlantium, see **Surge Protector Devices** on page 17.

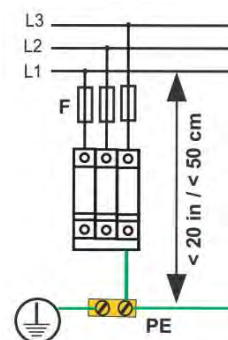


Figure 5-14: Surge protection device wiring - 440/480VAC

5.8 The Control Module

The **Control Module** contains a jumper marked **11** in the figure below.

Table 5-1: **Control Module** Components

#	Item
1	Mounting Holes
2	Data Cable + Gland
3	Electrical Cable + Gland
4	Electrical Connectors
5	Holes for Peripheral Component Connections
6	Various Component Connectors (See Table 5-8 on page 68)
7	Ethernet Connector
8	Circuit Breaker
9	Wireless Modem (optional item - factory installed)
10	Connector for Wireless Modem (optional item - factory connected)
11	Jumper
12	Gnd Wire
13	Connection to Screen Display
14	Two USB Ports (top side of the board)

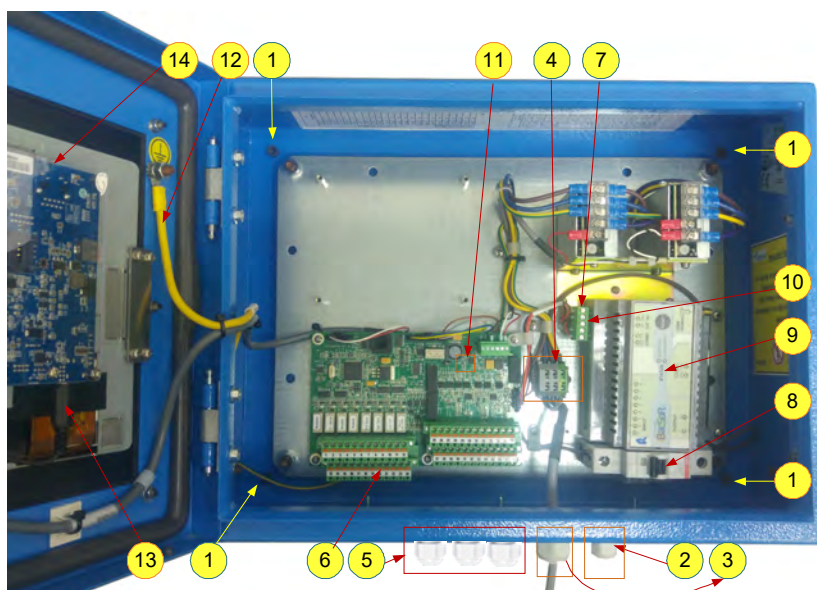


Figure 5-15: Control Module Interior

5.8.1 Mounting the Control Module

For exact physical dimensions of all units, be sure to consult the Mechanical ICD drawings provided to you by Atlantium with this manual.

The **Control Module** can be mounted on a wall or suitable anchoring point. The **Control Module** comes with an electrical 1.6M/ 5.25ft. long (1.5m/4.92ft. from the PG gland) and a Data cable (for length options, see the table below). However, it can be placed up to 50M/ 164.04 ft. from the Atlantium Unit, in a place that it is easy to reach the touch screen and read the monitoring information. A longer Data Cable can be ordered for this purpose.

ATTENTION!

- When mounting the **Control Module**, take into consideration the length of the cables.
- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**



For preparing all electrical connections and mechanical installation, be sure to review the electrical and mechanical ICD drawings provided to you by Atlantium with this manual. If no electrical drawings were provided please contact your Atlantium representative.

Table 5-2: Control Module Data Cable Length Options

Catalog No.	Metric	US Units
HSL013400	2 m	3.28ft.
HSL013100	5 m	6.56ft.
HSL014500	10 m	32.81ft.
HSL014540	15 m	49.21ft.
HSL014541	20 m	62.17ft.
HSL014542	25 m	82.02ft.
HSL014550	30 m	98.43ft.
HSL014560	50 m	164.04ft.

➞ To mount the Control Module on the wall:

- Step 1.** On the wall space designated for the **Control Module**, make four marks according to the spacing measurements for mounting orientation on the ICD drawing accompanying the documentation.
- Step 2.** The mounting holes **(1)** are 8.5mm (0.33") in diameter. Using the appropriate drill bit, drill the four holes.
- Step 3.** In each hole, insert a plastic anchor.
- Step 4.** Uncrate the **Control Module** package and carefully lift it out.
- Step 5.** Open the door of the **Control Module** and remove the plastic covers on the four holes.
- Step 6.** Position the **Control Module** so that its four holes fit over the drilled holes.
- Step 7.** Using appropriate screws and with a screwdriver, screw in the four screws in a diagonal pattern (one corner, then the opposite corner).
- Step 8.** To secure the **Control Module** firmly, return to each screw in the diagonal pattern and tighten the screws securely.

➞ To mount the Control Module on skids:

- Step 1.** At the location designated for the **Control Module** set up the skids with spacing that matches the spacing measurements for mounting orientation on the ICD drawing accompanying the documentation.

- Step 2.** The mounting hole (1) are 8.5mm (0.33") in diameter. Using the appropriate bolts and nuts, with a screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24") sticking out.
- Step 3.** Uncrate the **Control Module** package and carefully lift it out.
- Step 4.** Open the door of the **Control Module** and remove the plastic covers on the four holes.
- Step 5.** Position the **Control Module** so that its four holes fit over the corresponding holes on the skids.
- Step 6.** Using appropriate bolts and nuts and with a screwdriver, screw in the four bolts adding the nuts in a diagonal pattern (one corner, then the opposite corner).
- Step 7.** To secure the **Control Module** firmly, return to each bolt in the diagonal pattern and tighten them securely.

5.9 Mounting the Power Module

For systems requiring the Power Modules (refer to ICD of Power Module and **Electrical Requirements** on page 27) the Power Modules can be mounted on a wall or suitable anchoring point up to 10 meters (32.8 ft.) (according to the cable length you ordered from Atlantium) from the Atlantium unit. A Power Module can be positioned near a Ballast Module with a minimum of 300 mm (11.8 inches) of clearance on each side for proper ventilation.



- **When mounting the Power Module, take into consideration the length of the cables.**
- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**
- **The customer must provide the Power cable to the mains.**

➤ To mount the Power Module on the wall:

- Step 1.** On the wall space designated for the Power Module, make four marks according to the spacing measurements for mounting orientation on the ICD drawing accompanying the documentation.
- Step 2.** The mounting holes (B) are 8.5mm (0.33") in diameter. Using the appropriate drill bit, drill the four holes.
- Step 3.** In each hole, insert a plastic anchor.
- Step 4.** Uncrate the Power Module package and carefully lift it out.
- Step 5.** Open the door of the Power Module (A) and locate the mounting holes (B).
- Step 6.** Remove the protective covers from each hole.

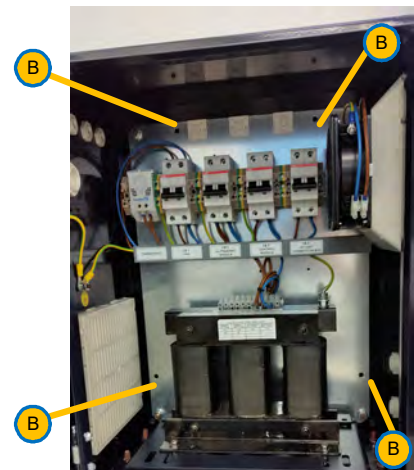


Figure 5-16: Power Module - Mounting Holes

- Step 7.** Position the Power Module so that its four holes fit over the drilled holes.
- Step 8.** Using appropriate screws and with a screwdriver, screw in the four screws in a diagonal pattern (one corner, then the opposite corner).
- Step 9.** To secure the Unit firmly, return to each screw in the diagonal pattern and tighten the screws securely.

➤ To mount the Power Module on skids:

- Step 1.** At the location designated for the Power Module, set up the skids with spacing that matches the spacing measurements for mounting orientation on the appropriate ICD drawing accompanying the documentation.
- Step 2.** The mounting hole (B) are 8.5mm (0.33") in diameter. Using the appropriate bolts and nuts, with a screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24") sticking out.
- Step 3.** Uncrate the Power Module package and carefully lift it out.
- Step 4.** Open the door of the Power Module (A) and locate the mounting holes (B).

- Step 5.** Remove the protective covers from each hole.
- Step 6.** Position the Power Module so that its four holes fit over the corresponding holes on the skids.
- Step 7.** Using appropriate bolts and nuts and with a screwdriver, screw in the four bolts adding the nuts in a diagonal pattern (one corner, then the opposite corner).
- Step 8.** To secure the Unit firmly, return to each bolt in the diagonal pattern and tighten them securely.

5.10 Installing the Ballast Module(s)*

Each UV lamp requires a corresponding Ballast Module. The location for mounting the Ballast Module(s) must take into account the length of the cables to be attached from the Atlantium Unit. If you need to calculate space-cooling requirements for the location in which you are installing the Ballast Module(s), refer to the table for heat load per Ballast Module, shown below:

Heat Load per Ballast Module: 50W



ATTENTION!

- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits or cable trays and must not be stretched.**
- **Install the Ballast Modules of the Atlantium system in an area where the air is clean and free of dirt particles in suspension (e.g. sand, dust, oil, food powders, etc.). This precaution protects the BM cooling fans/vents from blockage by dirt.**

*For maintenance procedure and diagram of Ballast Module Types B/C, see **Checking & Cleaning the BM Cooling Fans** on page **123**

Ballast Modules must be installed vertically and positioned at least one meter above ground level. Ballast Modules must be at least 300mm (12") from each other or from any other object around them to allow proper ventilation. Ballast Modules must not be installed within closed cabinets.

You can mount them next to each other horizontally or one above another vertically. Atlantium recommends you arrange the Ballast Modules in consecutive order from left to right according to the number marked on the bottom of the Ballast Module.

Consult the **Ballast Module's ICD** accompanying this manual.

BALLAST MODULE C (Power Unit version).

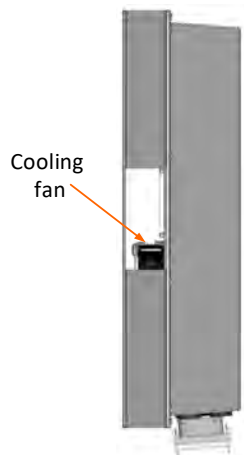


Figure 5-17: Ballast Module C side view

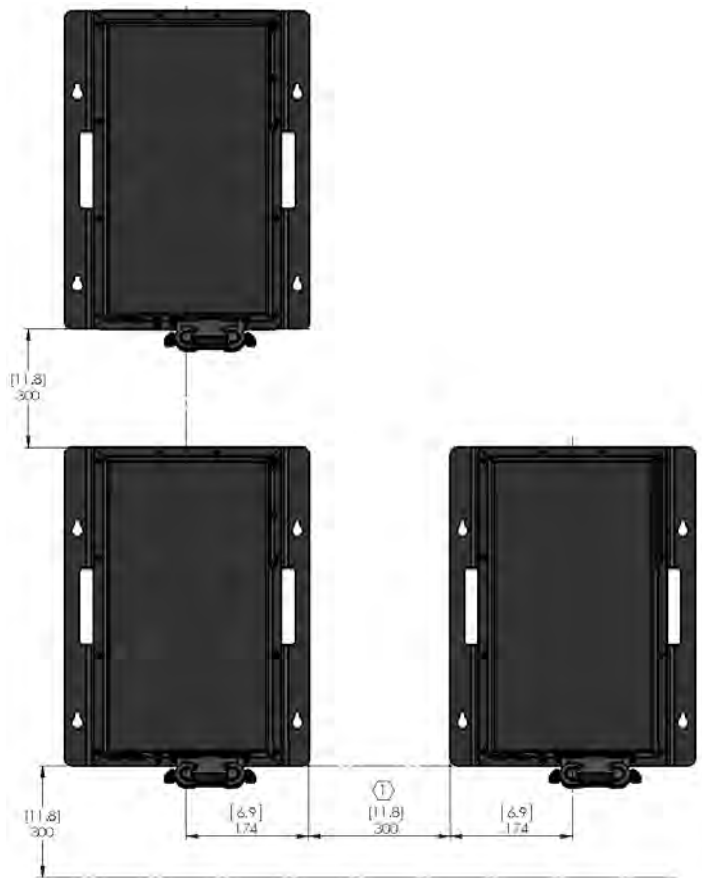


Figure 5-18: Multiple Ballast Module C Installation Diagram

➔ To mount a Ballast Module on the wall:



The Ballast Module is heavy! Be sure that the wall on which you intend to mount the Ballast Module is strong enough to carry its weight.

- Step 1.** On the wall space designated for the Ballast Modules, make four marks according to the spacing measurements for mounting orientation on the ICD drawing accompanying the documentation.
- Step 2.** The keyhole slots for mounting are 7mm (0.28") in diameter for screws size M6 OR 1/4" bolts. Using the appropriate drill bit, drill the four holes.
- Step 3.** In each hole, insert a plastic anchor and with the appropriate screwdriver, screw in the screw leaving around 5.6mm (0.20-0.24") sticking out of the wall.
- Step 4.** Uncrate the Ballast Module package and carefully lift out the Unit.
- Step 5.** Fit the keyhole slots onto the protruding screw heads and slide the Unit downward until the top of the keyhole slots rest on the screws.
- Step 6.** To secure the Unit firmly, tighten the four screws.

Installing the Atlantium System

➡ To mount a Ballast Module on skids:

- Step 1.** At the location designated for the Ballast Modules, set up the skids with spacing that matches the spacing measurements for mounting orientation on the ICD drawing accompanying the documentation.
- Step 2.** The keyhole slot for mounting is 7mm (0.28") in diameter for screws size M6 OR 1/4" bolts.
- Step 3.** Using the appropriate screwdriver, screw in the four bolts and add the nuts leaving around 5.6mm (0.20-0.24") sticking out.
- Step 4.** Uncrate the Ballast Module package and carefully lift out the Unit.
- Step 5.** Fit the keyhole slots onto the protruding bolt heads and slide the Unit downward until the top of the keyhole slots rest on the bolts.
- Step 6.** To secure the Unit firmly, tighten the four bolts and their nuts.

5.10.1 Connecting the Ballast Module Cables

One end of the **Cable Harness** is attached to the connection box of each lamp of the Atlantium Unit. Refer to the **Electrical ICD** drawing provided to you by Atlantium with this manual for the connection of the other end of the **Cable Harness** - .

➡ To connect the cable:

Table 5-3: Ballast Module Details

#	Item
A	Single Connector with lock latch
B	48VDC for Fan - 440/480VAC only
C	Pressure Relief
D	Fuse Housing (for Atlantium Technicians only)
E	Connector width 13.11cm / 5.159inch.



Figure 5-20: Connector Detail

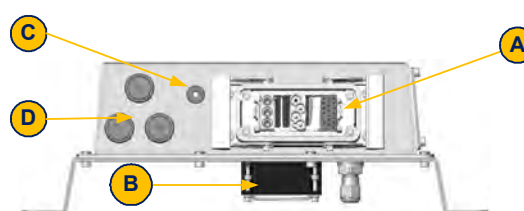


Figure 5-19: Ballast Module C-Waterproof Box (bottom view)

- Step 1.** According to the electrical drawing of the Installation plan, bring the **Cable Harness** attached to the Connection Box of Atlantium Unit up to the Ballast Module.
- Step 2.** On the Ballast Module, pull the lock latch of the connector to the open position and remove the protective cover.



Be sure to save the protective cover of the Ballast Module connector in an accessible location for the future in case you need to dismantle the Ballast Module for any reason.

- Step 3.** Connect the lamp cable lead to the Lamp connection port (**A** in the figures above) (the connector is keyed so it only matches in one position) and pull the lock latch closed to secure the connection.

5.11 Connection Box



- The Connection Boxes on top of the Atlantium unit are generally delivered to the customer pre-connected to the other system elements. This section describes connection that may need to be added or changed, according to customer requirements.
- On one side of the Connection box, there are 6 holes (marked **A** in the diagram Figure 5-21 on page 57) to be used to thread these cables, if required.
- The Connection Box Card contains terminals for connecting signal wiring, however, Atlantium recommends connecting the signal wiring for these on the **Control Module**. Consult your Atlantium technician to see if the **Control Module** software installed supports connection to Connection Box terminals.



WARNING!

DO NOT DRILL INTO THE CONNECTION BOXES OR ALTER THEM IN ANY WAY!!!!

The Connection Box already contains entry glands for ALL of the cabling needs.



Making holes in a Connection Box will destroy its waterproof seal, endangering the components inside. Do Not draw electricity from the Atlantium Unit's Connection Box as it will damage the Unit's electrical configuration.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Atlantium uses the following types of Connection Box (LM) cards:



- The first junction box is labeled with the number 1.
- If the first junction box is referenced and the system contains only one junction box, the only junction box is the first.

Table 5-4: Connection Box (LM) cards

Connection Box Card Type	P/N	For use in systems...:
700/750	AP0000700/ AP0000750	systems with Ultrasonic Cleaner
1300	AP0001300	RZ systems without Ultrasonic Cleaner
1350	AP0001350	RZB systems
1400	AP0001400	together with Card 1300 or 1350 for systems with DPM cleaner
1500	AP0001500	together with Card 1300 or 1350 for systems without DPM cleaner

5.11.1 Connecting the Ultrasonic Cleaning Cables

For systems with the Ultrasonic Cleaning system only, the cables must be connected between the Ultrasonic Cleaning Module and the Connection Box #1.



Do not alter any cable connection that is supplied from the factory. The Ultrasonic Cleaner cable is connected to a terminal in the Connection Box from the factory. The Data cable is connected in the Ultrasonic Cleaner Module from the factory.



Atlantium recommends connecting the signal components to the **Control Module**. However, connection to the LM card may be used as an alternative. You should consult your Atlantium technician about this.

The Ultrasonic Cleaner cable is connected to a terminal in the Connection Box from the factory. The Data cable is connected in the Ultrasonic Cleaner Module from the factory.

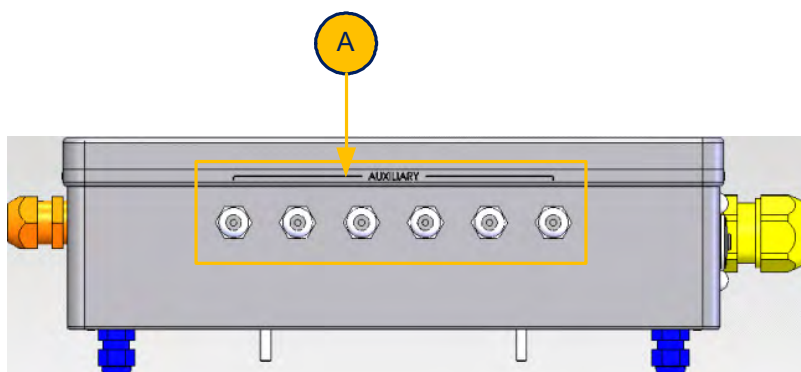
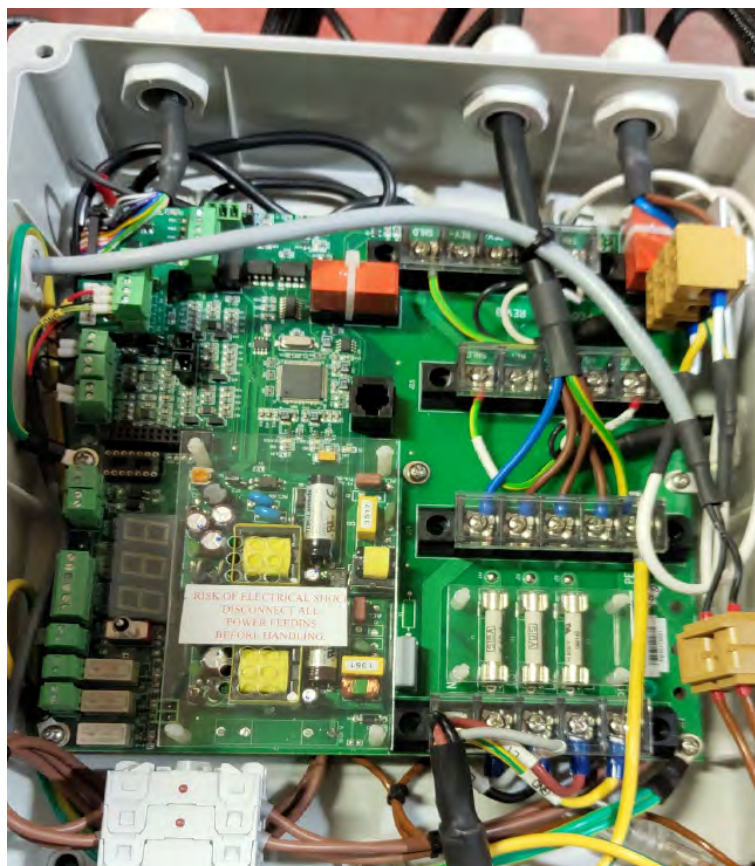


Figure 5-21: Connection box with cable insertion holes (A)



Connection Box with LM Card 700/750 (for system with ultrasonic cleaner)

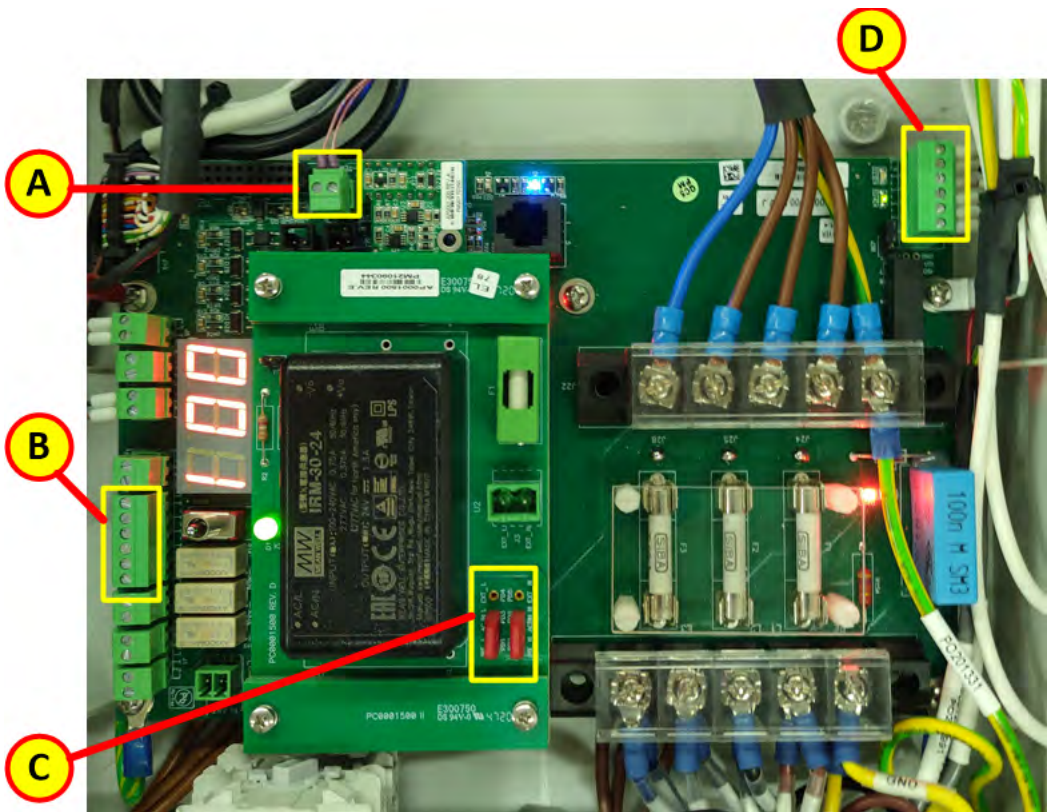


Figure 5-22: Connection Box LM Card 1300+1500 (for RZ system without cleaner)

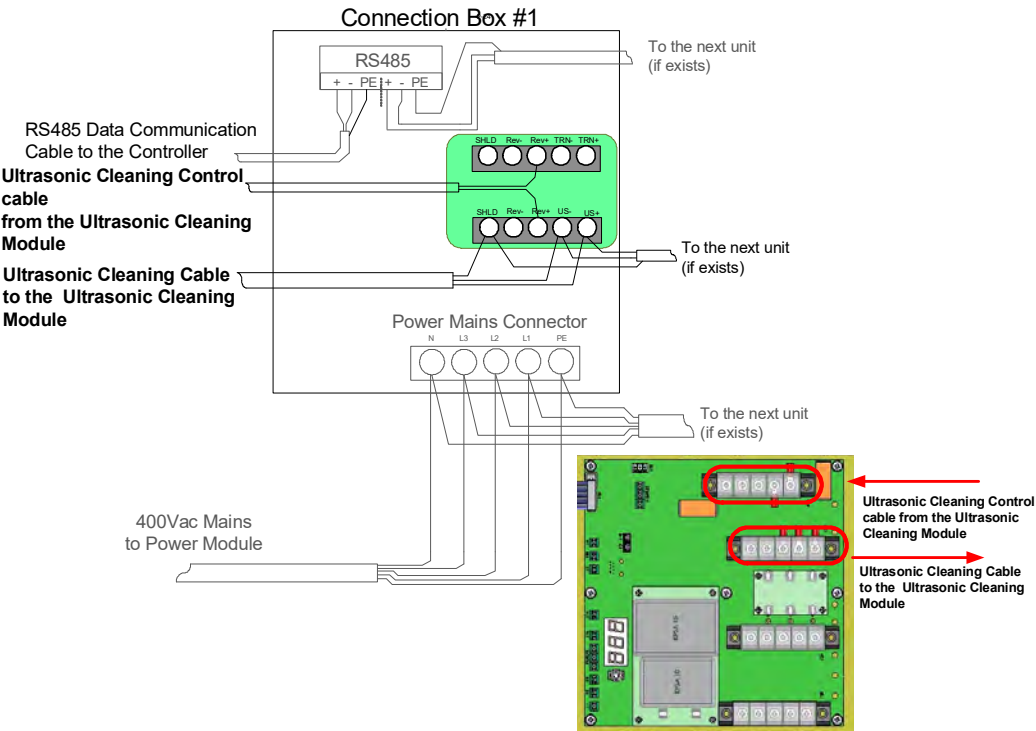


Figure 5-23: Cabling Schematic Diagram

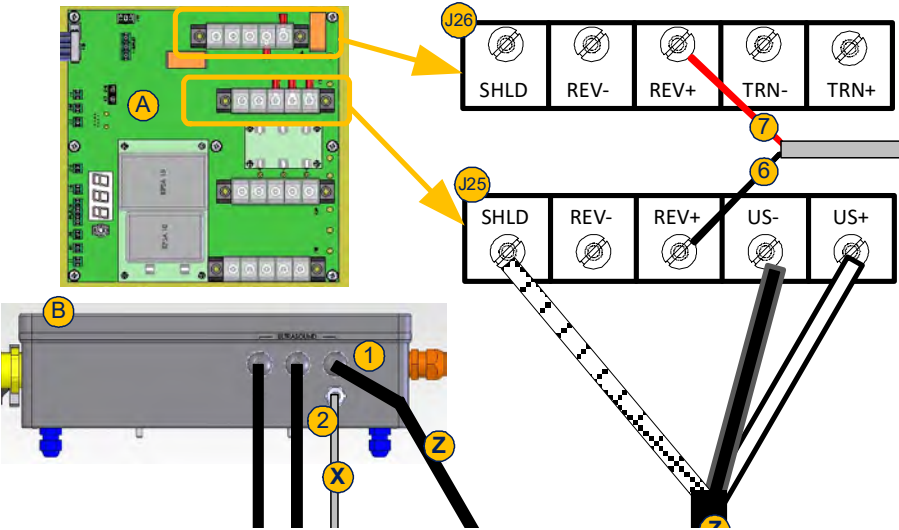


Figure 5-24: Ultrasonic Cleaner Cable Connections in the Connection Box

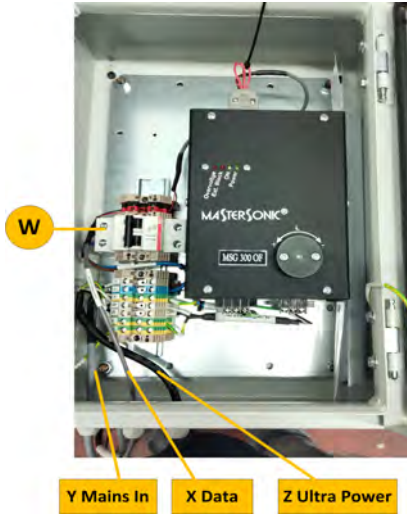


Figure 5-25: Ultrasonic Cleaner Module - Inside View

➤ To connect the ultrasonic Cleaning system cables:

- Step 1.** The Ultrasonic Cleaner cable (marked **(Z)** in Figure 5-24 above) is connected in the Connection Box #1 to terminal **(J25)** from the factory. From the Connection Box, extend the Ultrasonic Cleaner cable **(Z)** to the Ultrasonic Cleaner Module and thread it through gland in Figure 5-25 .
- Step 2.** Connect the Ultrasonic Cleaner (Z) cable's White wire to the **US+** port on the Ultrasonic Cleaner Module terminal in Figure 5-26.
- Step 3.** Connect the Ultrasonic Cleaner cable's Black wire to the **US-** port on the Ultrasonic Cleaner Module terminal in Figure 5-26 to the right.

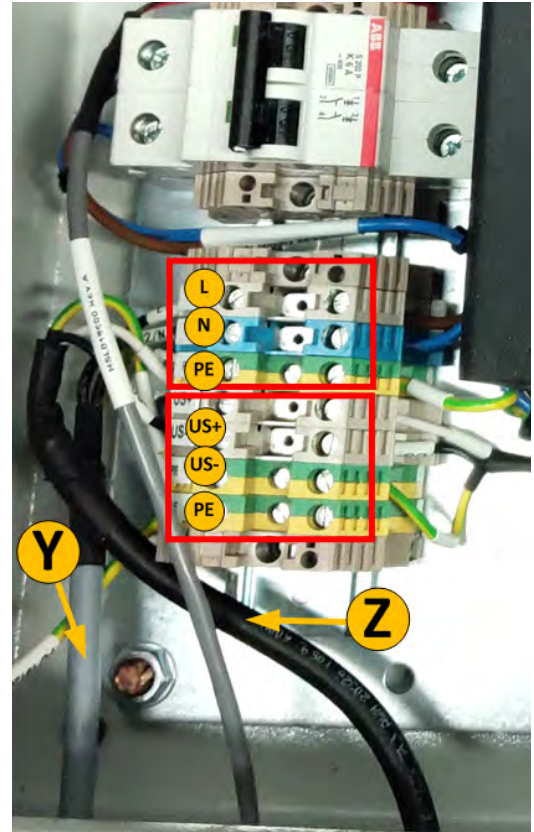


Figure 5-26: Ultrasonic Cleaner Module Terminals

- Step 4.** From the Ultrasonic Cleaner Module, extend the Control cable (marked **(X)** in Figure 5-24 above) to the Atlantium Unit and thread it through gland **(2)** on the Connection Box #1 **(B)**.
- Step 5.** Connect the Data cable's Black wire **(6)** to the REV+ port on the Ultrasonic Cleaner terminal **(J25)**.
- Step 6.** Connect the Data cable's Red wire to the **(7)** REV+ port on the Ultrasonic Cleaner terminal **(J26)**.

5.11.2 Connecting the Power Cable to the Ultrasonic Cleaning Module

For systems with the Ultrasonic Cleaning system only, the power cable to be connected to the mains must be connected to the Ultrasonic Cleaning Module.



Do not plug in the Ultrasonic Cleaner Module to an outlet until after the hardware installation is complete and the system is ready to be initialized.

Table 5-5: LM cards 1300 + 1500

#	Description
A	Temperature sensor input
B	Flow meter input
C	Jumpers for 380 V on 1500 card
D	Communications connector

➔ To connect the power cable to the Ultrasonic Cleaning Module:

Step 7. Thread the cable (Y) through the gland (Y) and connect it L - N - PE as shown as in the diagram

5.11.3 Connecting the Ultrasonic Cleaning Module and Power Module.

➔ To connect the Ultrasonic Cleaning Module to the Power Module:

- Step 1.** Open the door of the Power Module.
- Step 2.** Thread the Mains Power cable into the module through one of the glands [C] on the lower R side, and connect to terminal block [D] according to the relevant diagram supplied with the unit.
- Step 3.** Thread the cable from the Ultrasonic Module through the innermost gland [E#] and connect to [E], which is labeled CB2.
- Step 4.** Similarly, thread the cable from the Control Module through the gland [F#] and connect to [F], labeled CB3.
- Step 5.** Similarly, thread the cable from the Connection Box through the gland [G#] and connect to [G], labeled CB4.

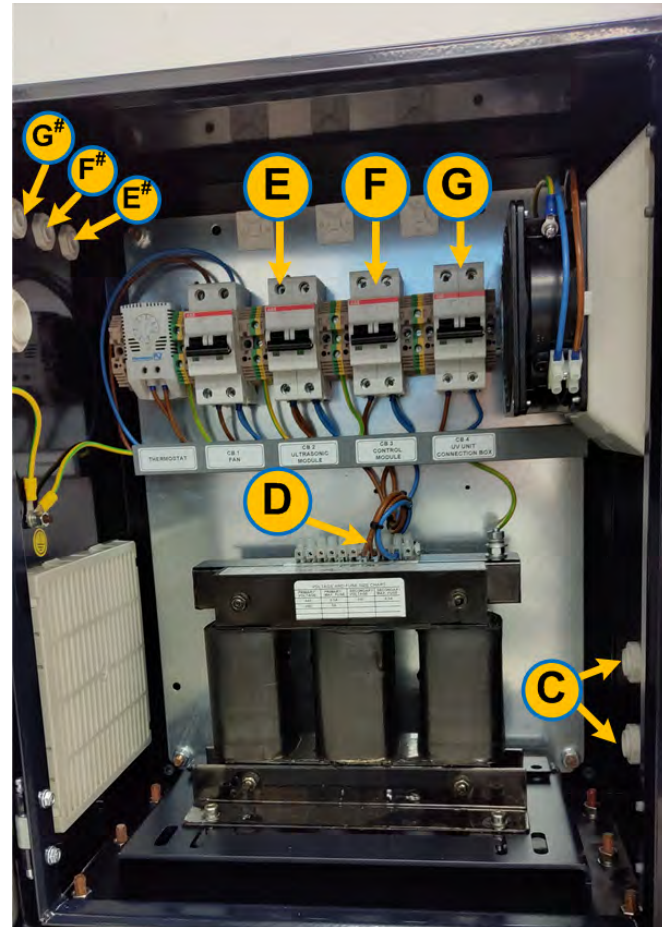


Figure 5-27: Power Module - connections

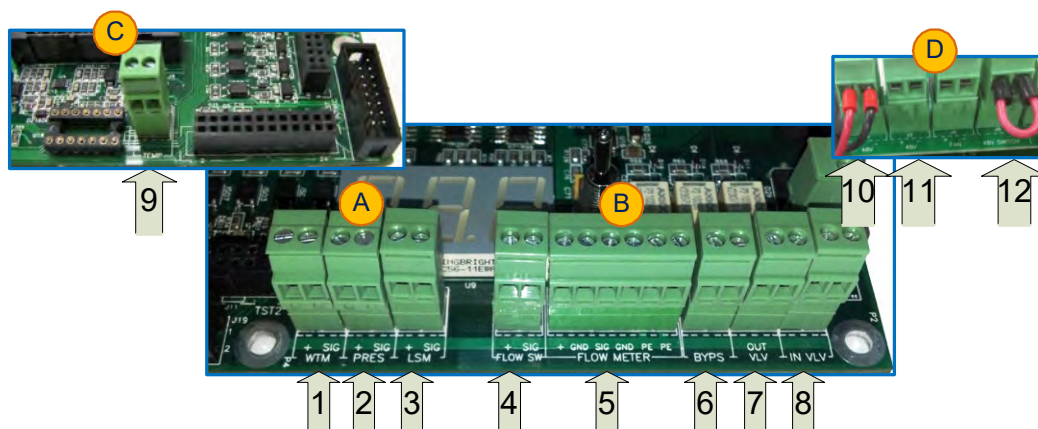


Figure 5-28: Connectors on Connection Box Card 1300+1400

Table 5-6: Connections Key - Connection Box Card 1300+1400

#	Text on the Circuit Board	Description	Signal type	Value	Notes
A					
1	WTM	UVT Analyzer input	Analog	4-20mA	already assembled
2	PRES*	Pressure Transmitter input (Optional)	Analog	4-20mA	Optional
3	LSM	UVIS Sensor input	Analog	4-20mA	already assembled
B					
4	FLOW SW*	Flow switch input	Digital	Dry contact / Open collector	Either Flow Switch or Flow Meter Optional *
5	FLOW METER*	Flow meter input	Analog	4-20mA	
6	BYPSTR*	Bypass valve output	Dry contact		Optional
7	OUT VLV*	Output valve output	Dry contact		Optional
8	IN VLV*	Inlet valve output	Dry contact		Optional
C					
9	TEMP	Temperature sensor input	Analog		already assembled
D					
10	48V	48V power connection for DPM			already assembled
11	48V	Daisy chain connector for additional lamps for 48V power connection for DPM			already assembled
12	48V Switch	Jumper			already assembled
E	Various	DPM connectors			already assembled

➡ To connect the Data cable:

Step 1. Extend the Data cable connected to Connection Box #1, out to the **Control Module** and connect it to the following terminals on the RS485 port of the Control Module (Figure 5-29).

Step 2. Note that the Data cable is connected to the **RS-485** terminal block marked [7] in Figure 5-15 on page 50, with the three wires connected to the available +, -, and PE ports (1,2+3) according to the diagram on the right. (The second port set is used to daisy-chain to an additional Connection box as relevant.)

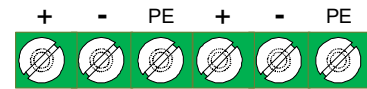


Figure 5-29: RS485 Data Cable Connector



Do not make alterations to or drill into the Ballast Modules, Control Module, or any other component of the Atlantium System. Such alterations void the Atlantium Warranty.

5.12 Connecting Peripheral Equipment

5.13 Modbus Communication Connections

Modbus is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition systems.

The Atlantium system can be controlled directly from your facility control system via Modbus - RTU on RS485 (network) serial connection.

To accomplish this:

The Modbus Settings must be configured in the **Control Module**. See *Configuring More Settings* on page 80.

5.13.1 Control Module Connections

You can connect signal wires for the following peripheral equipment to the **Control Module's** terminal block:

- | | |
|-------------------------------|-----------------------|
| ■ Atlantium Unit's Data Cable | ■ Inlet Valve Output |
| ■ System Ready/Outlet Valve | ■ Bypass Valve Output |
| ■ General Alarm | ■ Flow Meter Input |
| ■ Shutdown Warning | ■ Flow Switch Input |
| ■ High Temperature | ■ External On/Off |
| ■ UVT Out | ■ Dose Output |
| ■ Low UVT | ■ Modbus |
| ■ Low/Normal Mode | |

➤ To connect peripheral equipment:

- Step 1.** Using the attached key, open the screen panel of the **Control Module**.
- Step 2.** Use the holes, adding plastic glands as needed, on the bottom (**B**) to insert cables.
- Step 3.** Use the hole (**C**), adding plastic glands as needed, on the bottom to insert the data cable from the Atlantium Unit.
- Step 4.** Thread the cables to the appropriate connector (**A**) according to the table below.
- Step 5.** For connecting to an external facility control via Modbus, see Appendix A, **Modbus Communication Protocol** on page 176. Add jumpers to any unused pins as shown in the diagram below.

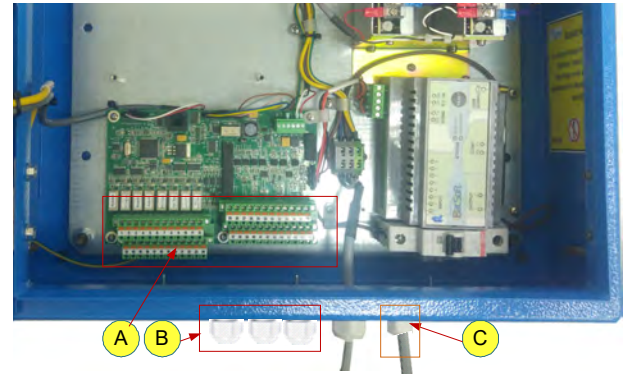


Figure 5-30: Control Module Interior Generic

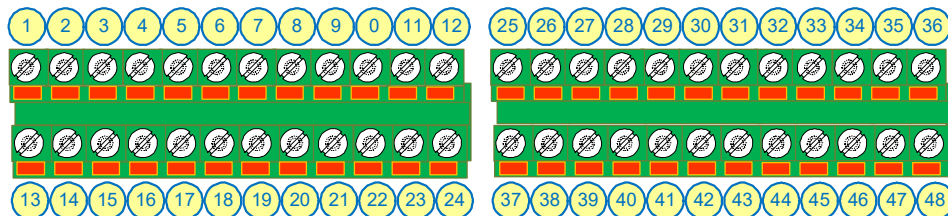


Figure 5-31: Control Module Terminal Connectors

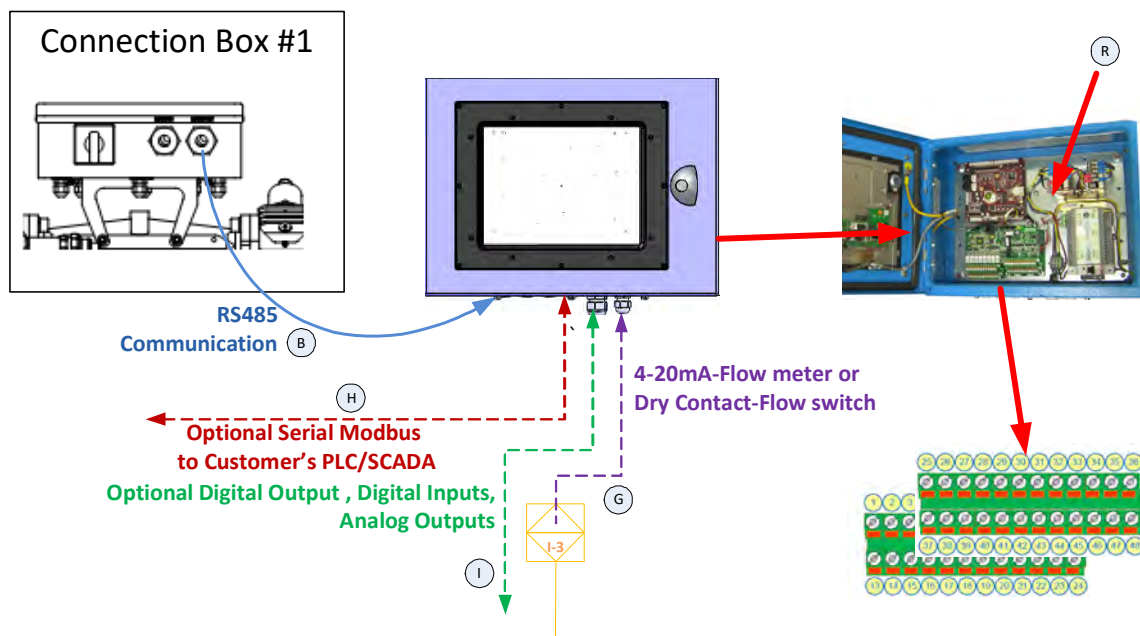


Figure 5-32: Digital and Analog Input and Output Connections-Schematic Diagram

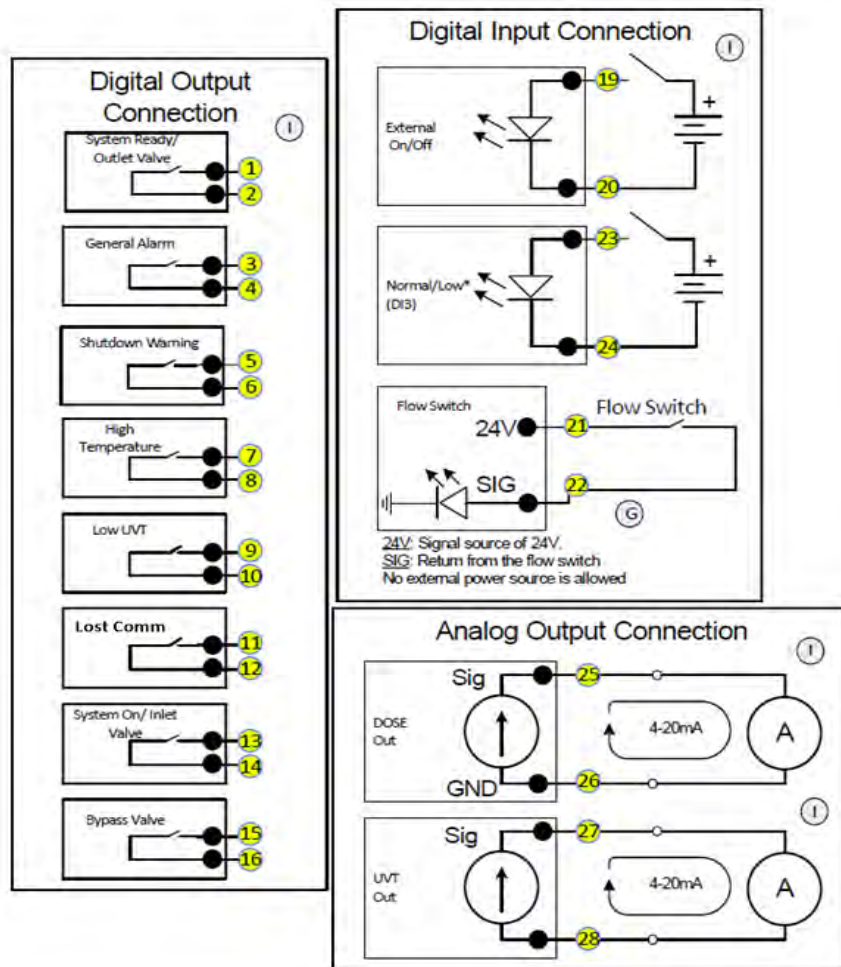


Figure 5-33: Digital and Analog Input and Output Connections

*** Low:** The system works at minimum power no matter if it is set to power mode or dose mode.

Normal: In power mode the power is as user defined and in dose mode the system regulates the power as necessary during regular operations.

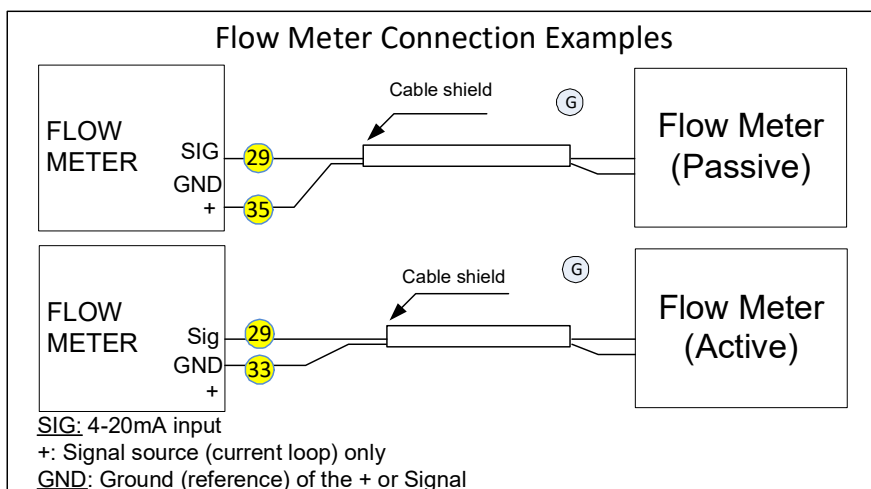


Figure 5-34: Flow Meter Connection Examples

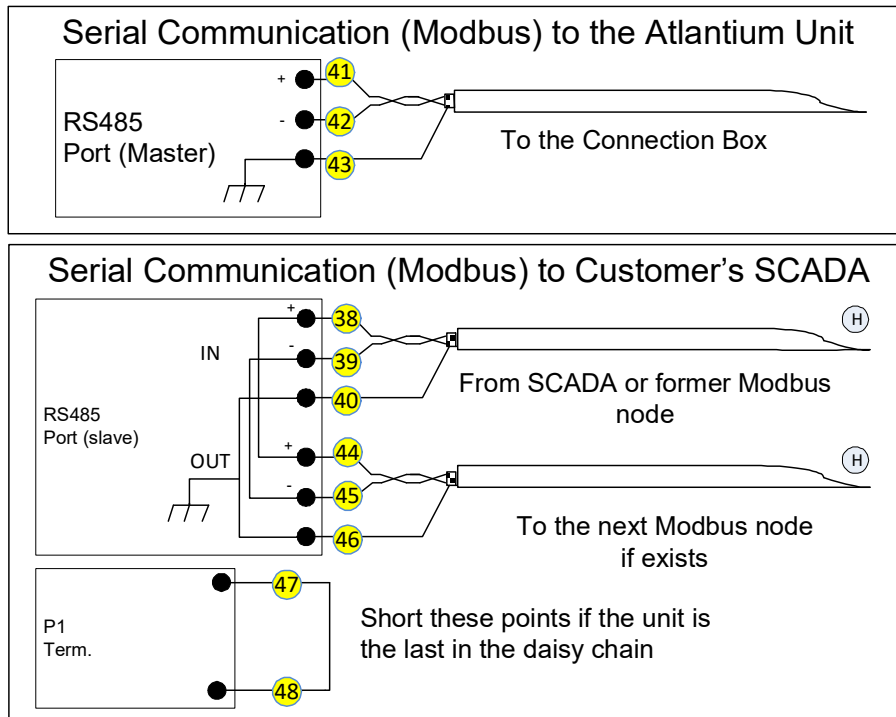


Figure 5-35: Serial Communication (Modbus) Connections



For incoming power to the **Control Module** and the Connection Box, see the power distribution diagram.

Table 5-7: Peripheral Equipment Cable Details

#	Item	Sizes	Cat. No.	Description	Diameter	Supplied by
B.	Control Module RS485 data communication cable	5m/16.4ft.	HSL013200	Shielded twisted pair, 22AWG, 300V(General cables C0720A)	0.25 inch	Atlantium
		10m/32.8ft.	HLS014500			
G.	Flow Meter 4-20mA or Flow Switch cable Dry contact	Customer defined	-	Connect to Connection Box no.1 through gland size 7. Wires size according to Flow Meter / Flow Switch manufacturer's instructions	0.25 inch	Customer

Table 5-7: Peripheral Equipment Cable Details

#	Item	Sizes	Cat. No.	Description	Diameter	Supplied by
H.	RS485 Data communication cable	Customer defined	-	Shielded twisted pair, 22AWG, 300V	0.25 inch	Customer
I.	Digital output , Digital inputs, Analog outputs	Customer defined	-	Shielded cable, pairs of 22AWG, 300V	According to the number of pairs	Customer
R.	Laptop Control Module interconnect	Customer defined	-	Standard ETHERNET cable	-	Customer

Table 5-8: Control Module Terminal Block Connector Pins J35 (J3+J5)

	Function	Pin's Number	Values
Digital Outputs	System Ready/Outlet Valve COM	1	Dry Contacts Max. Voltage: 24V max. Current: 2A max Max. switching capacity: 50W max
	System Ready/Outlet Valve N.O.	2	
	Alarm COM	3	
	Alarm N.O.	4	
	Shutdown Warning COM	5	
	Shutdown Warning N.O.	6	
	High Temperature COM	7	
	High Temperature N.O.	8	

Table 5-8: Control Module Terminal Block Connector Pins J35 (J3+J5)

	Function	Pin's Number	Values
Digital Outputs	Low UVT COM	9	
	Low UVT N.O.	10	
	Lost COM	11	
	Lost COM N.O.	12	
	System On/Inlet Valve COM	13	
	System On/Inlet Valve N.O.	14	
	Bypass Valve COM	15	
	Bypass Valve N.O.	16	
	Spare	17	
	Spare	18	
Digital Inputs	External On/Off (DI1) +	19	On: 10-48VDC Off: <1VDC See External On/Off - Additional Notes on page 71
	External On/Off (DI1) -	20	
	Flow Switch (DI2) 1	21	
	Flow Switch (DI2) 2	22	
	Low/Normal Mode(DI3)+	23	
	Low/Normal Mode (DI3)-	24	
Analog Output	Dose Out+	25	4-20mADC, Max. Rsens= 200R
	Dose Out- (GND)	26	
	UVT Out+	27	
	UVT Out - (GND)	28	

Table 5-8: Control Module Terminal Block Connector Pins J35 (J3+J5)

	Function	Pin's Number	Values
Analog Input	Flow Meter Return 4-20mA	29	4-20mA
	Analog Spare Return 4-20mA	30	
	Spare	31	
	Spare	32	
	GND for 4-20mA (for Flow Meter-option 1)	33	
	GND for 4-20mA (for Analog Spare Meter-option 1)	34	
	24V for 4-20mA (for Flow Meter-option 2)	35	
	24V for 4-20mA (for Analog Spare-option 2)	36	
	Spare	37	
Modbus Slave in	RS485 Rx / Tx+	38	Main Modbus connector. For RS485 physical connections, to make a Modbus daisy chain incoming connection from another Control Module. The jumper is required. For wireless modem connections, the jumper must be removed (LED is off).
	RS485 Rx / Tx-	39	
	RS485 PE	40	Earthing
Modbus Master	RS485 Rx / Tx+	41	Connector for the Atlantium Unit's Data Cable
	RS485 Rx / Tx-	42	
	RS485 PE	43	Earthing
Modbus Slave out	485 Rx / Tx+	44	To make a Modbus daisy chain outgoing connection to another Control Module
	485 Rx / Tx-	45	
	485 PE	46	Earthing
Slave RS485	Term 1	47	Termination connector
	Term 2	48	For the Control Module that is last in a daisy-chain, insert a jumper here

5.13.2 External On/Off - Additional Notes

For regular wiring:

- Positive voltage must be connected to pin 19 – IN+
- Negative (GND) must be connected to pin 20 – IN-

Table 5-9: External On/Off

Control Module Screen External On/Off	Physical Connection	Physical Connection	Lamp Control
	IN+	IN-	
Normally Open	0 VDC	0 VDC	Off
Normally Open	+24 VDC	0 VDC	On
Normally Closed	0 VDC	0 VDC	On
Normally Closed	+24 VDC	0 VDC	Off

- The Facility control system communication properties must be configured to match that of the Atlantium system, see Section 5.13.3.
- For the terminal block connectors for the Modbus in the **Control Module**, see Table 5-8 above.
- Signalling communication incoming to the facility control system is according to the Modbus Registers. Appendix A, **Modbus Communication Protocol** on page 176.

ATTENTION!

To ensure communications are operational, be sure to connect the cables **TX to RX** and **RZ to TX**.

5.13.3 Setting Up the Facility System Communication Properties

To properly configure communications between your Atlantium system and control network, set up the communication properties and **COM1** port settings at the facility control system as follows:

Node Address:	1 to 256 ***
Available Commands	Function codes
Function Codes: *	0x03
Supports IEEE Floating Point: **	NO (register/xxx)
Baud Rate:	4800, 9600, 19200, 38400, 57600, 115200 ***
2 Wire	
Parity:	None
# of Stop Bits:	1
# of Data Bits	8

(*) Read all the registers in the system at once with **0x03** (includes coils, discreet coils, holding registers and input registers).

(**) Divide the desired parameter by xxx to calculate the correct signal point. See the Divide column in the table in the section, **Modbus Communication Protocol** on page 176.

(***) Must be the same in the **Control Module** setting

To view the Modbus Registers, which govern the signaling communication from the Atlantium system to the facility control system, see Table A-1 on page 176.

5.14 Connecting the Atlantium System to the Mains



DANGER!

ALL MAIN CIRCUIT BREAKERS OF THE ELECTRICAL LINE FEEDING THE ATLANTIUM SYSTEM COMPONENT MUST BE SET TO THE OFF POSITION AND LOCKED WITH AN APPROPRIATE LOCK TO PREVENT ACCIDENTAL CHANGE TO THE ON POSITION.

DO NOT REMOVE THE LOCK OR SET ANY MAIN CIRCUIT BREAKER TO THE ON POSITION UNTIL ALL ELECTRICAL WIRING IS PROPERLY CONNECTED.

UNCONNECTED WIRES/CABLES IN A LIVE ELECTRICAL FEED IS A HAZARDOUS SITUATION THAT CAN RESULT IN DEATH OR SERIOUS INJURY.

The infrastructure of the electrical connections is to have been prepared according to the *Electrical ICD* drawing provided to you by Atlantium with this manual.

For installations that require the Power Module 440-480VAC only, the customer must provide the Power cable to the mains.

5.14.1 Mains Connection Phases

Phase 1 Connect the **Control Module** to the mains.

Phase 2 Connect the Power Module to the mains (if exists).

Phase 3 Connect the Atlantium Unit's Power cable to the mains either directly or via the Power Module

ATTENTION!

- **Do not Stretch Electrical Cables - Avoid tension on the electrical cables. They are to be installed within conduits and must not be stretched.**

5.14.2 Connecting the Control Module's Power Cable

The **Control Module** comes with a power cable of 2m/6.5ft. length. For the electrical specifications, See *The Control Module* on page 17. Prepare the appropriate plug for the electrical standards of your region. Considering the distance between the **Control Module** and your electrical box, you may want to replace the electrical cable with a longer one.

➡ **To connect the Control Module's power cable:**

Step 1. Connect the appropriate plug for the electrical standards of your region.

Step 2. **Do not** plug in the **Control Module** to an outlet until after the hardware installation is complete and the system is ready to be initialized. (See *Initializing the Atlantium System* on page 78.)

Replacing the Control Module's Power Cable

You can order a longer cable from Atlantium or acquire one that conforms to the specifications, from a local source.



Avoid direct contact with the electronic circuit board which is sensitive to electrostatic discharge (ESD). Utilize best practices regarding ESD when replacing the power cable.

5.14.3 For Shipboard Installations

When the Atlantium Unit is installed shipboard, all metal components must be grounded to the nearest possible grounding point on the ship's metal structure. Be sure to prepare a ground point next to the designated location for the Atlantium Unit.



ATTENTION!

Please follow the electrical ICD drawings provided with your system.

5.14.4 Connecting the Atlantium Unit's Power Cable



This section applies to systems with 400VAC and for systems with 440/480VAC without Ultrasonic Cleaner. For systems with Ultrasonic Cleaner, Power Module(s) are included. If your system includes the Ultrasonic Cleaner, see **Connecting the Atlantium System to the Mains** on page 72

The Atlantium Unit comes with a power cable of (5m/15ft.) or 10m/30ft (according to you order.) Prepare the appropriate cables and plugs for the facility mains connection according to the electrical standards of your region. Considering the distance between the Atlantium Unit and your electrical box, you may want to replace the electrical cable with a longer one.



- **A certified electrician is required to perform these procedures. Follow your local regulations.**
- **Do not** connect the Unit's Power cable to an outlet until after the hardware installation is complete and the system is ready to be initialized. (See **Initializing the Atlantium System** on page 78.)
- **Do not** connect the Unit's Power cable to an outlet until after the hardware installation is complete and the system is ready to be initialized. (See **Initializing the Atlantium System** on page 78.)

➞ To connect the Atlantium Unit's power cable:

- If your system configuration requires a Power Module, see **Connecting the Control Module's Power Cable** on page 72
- If none of the above, Connect the appropriate plug for the electrical standards of your region and connect it to a mains outlet.

5.14.5 Replacing the Atlantium Unit's Power Cable



WARNING!

If you are replacing the electrical Power cable (to connect to the mains) with a longer cable, be sure to use the correct cable type (The Atlantium- supplied cable is 5-wire flexible cable of 4mm² each, 600V, HO7 RN-F 5G4 (Lapp, P/N 16001303)) and be sure to connect the wires of the cables according to the requirement of your local power distribution system as follows:

- **400 VAC:** 5-wire system that contains 3 phases, Neutral and Ground (**The Neutral and Ground are mandatory**)

Ground must be wired to proper grounding in the same phase circuit.

Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.



Prepare the following:

- Replacement Connection Box card
- #5 Allen wrench
- #1 Phillips screwdriver

➔ Replacing the Power Cable

- Step 1.** Ensure that the system is switched off and all power cables are disconnected from the mains.
- Step 2.** Using the appropriate Allen wrench, on the first Connection Box, open the Connection Box cover.



The power cables supplied with the unit has 5 wires: 3 Phases (L1, L2, L3), Neutral (N) and Ground (PE). However, for the 440/480V installation, the Neutral wire is redundant and is not to be connected on either side of the cable.

- Step 3.** Using the appropriate screwdriver, remove the Switch knob (D) from the switch plate (E).
- Step 4.** Using the appropriate screwdriver, unfasten the screws of the switch holder (F).
- Step 5.** Pull out the terminal block (B) and detach the 3 power phase cable leads (G, H, I).
- Step 6.** Remove the plastic cover (J) from the Power terminal.
- Step 7.** Using the appropriate screwdriver, carefully disconnect the N & PE power leads (K) and (L) from Power terminal.
- Step 8.** Loosen the plastic nut of the Power cable's gland (C) from underneath the connection box and pull out the power cable.
- Step 9.** Thread the replacement power cable into the gland.
- Step 10.** Using the appropriate screwdriver, connect the replacement Power cable leads (G, H, I).
- Step 11.** Return the switch to its place and refasten the Switch holder (F).
- Step 12.** Return the Switch place (E) to the correct position and reattach the Switch knob (D).
- Step 13.** Using the appropriate screwdriver, on the terminal block (B), connect the replacement Power cable leads (G, H, I).
- Step 14.** Connect the power leads (K) and (L) to Power terminal and return the cover (J).
- Step 15.** Tighten the plastic nut of the gland (B) from the underneath.
- Step 16.** Using the appropriate Allen wrench, close the Connection Box cover.

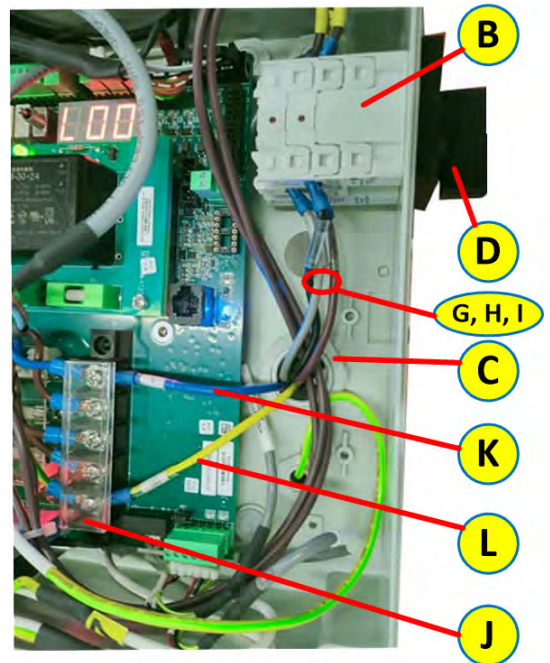


Figure 5-36: Power cable connections to connection box

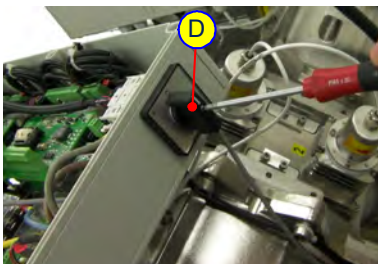


Figure 5-37: Replacing the Power Cable 1

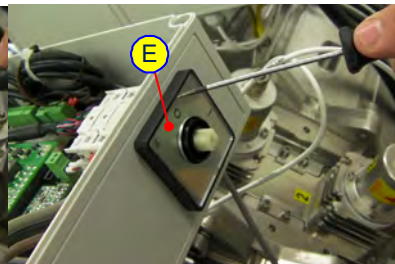


Figure 5-38: Replacing the Power Cable 2

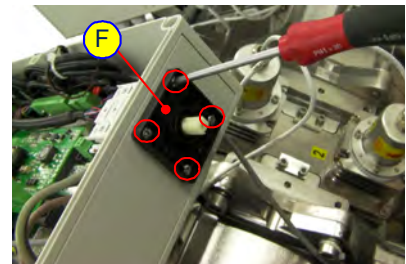


Figure 5-39: Replacing the Power Cable 3

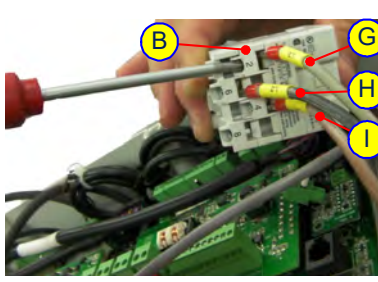


Figure 5-40: Replacing the Power Cable 4

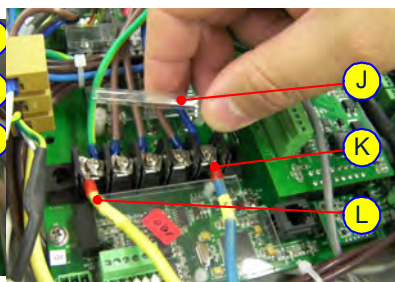


Figure 5-41: Replacing the Power Cable 5

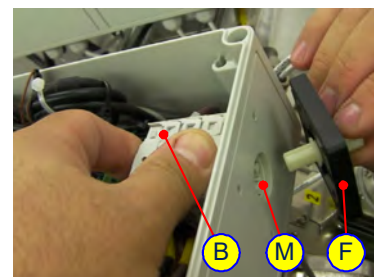


Figure 5-42: Replacing the Power Cable 6

5.15 Installation Check List

When you are ready to schedule the Atlantium technician to commission the Atlantium system, complete the check list below, based on Atlantium's **Commissioning Requirement Specifications**.

Send this check list together with digital photos of every angle of the installed system to your Atlantium representative. It generally requires at least 2 weeks after the check list has been completed to schedule the Atlantium commissioning.

Table 5-10: Atlantium System Installation Check List

Item	
System Serial Number	S.N: _____
System Orientation and Positioning The Atlantium Unit is installed: <input type="checkbox"/> Vertically - Water is flowing upward <input type="checkbox"/> Horizontally, with slope The following Modules are correctly and securely mounted and located in their final position: <input type="checkbox"/> Ballast Module <input type="checkbox"/> Control Module <input type="checkbox"/> Ultrasound Module (if purchased) <input type="checkbox"/> Transformer Module <input type="checkbox"/> All other purchased components are securely installed and have sufficient service clearance on all sides (according to the ICDs). <input type="checkbox"/> The Atlantium Unit and all of its components are not located where they may be in contact with direct water or chemical dripping. <input type="checkbox"/> Cable from system is connected to the Electrical Cabinet(s) Ballast Module(s) according to installation manual. The electrical cables between components are not stretched.	
Power Connections <input type="checkbox"/> Power cable is connected to the Electrical Cabinet(s) Ballast Module(s) Voltage rate _____ Number of phases _____ <input type="checkbox"/> Correct voltage was measured at entrance to Ballast Module Connection boxes You are scheduling an electrician to be on site and available on day and time of System commissioning - a MUST or the installation cannot be completed!.	
Water Flow <input type="checkbox"/> The Atlantium Unit is connected to the water pipes, according to the Installation plan developed by facility engineers and Atlantium personnel. <input type="checkbox"/> Proper pipe lengths (Inlet - 10D, Outlet - 5D) are installed. <input type="checkbox"/> The Unit has been checked while full of water and no bubbles or leaks exist in the system. The system is balanced, supported and pressure stable (no vibration, etc.). <input type="checkbox"/> No detected water hammers or pressure above 7 bars are on the line.	

Table 5-10: Atlantium System Installation Check List

Item
Flow Measurement Device (only one option is required) A flow meter or flow switch is installed and the electrical and data connection are complete. <input type="checkbox"/> If flow meter: 4 - 20 mA signal and Com wires are connected as instructed in this guide. <input type="checkbox"/> If flow switch: 2 wires from the flow switch are connected as instructed in this guide.
Accessories The following accessories are installed on the line and in accordance to Atlantium instructions <input type="checkbox"/> Sampling Valves <input type="checkbox"/> Draining Valves <input type="checkbox"/> CIP Ports <input type="checkbox"/> Air Release Valves
Inputs/Outputs required by the customer (require hard wiring): <input type="checkbox"/> Dose out <input type="checkbox"/> Ready Signal <input type="checkbox"/> General Alarm <input type="checkbox"/> Shutdown Warning <input type="checkbox"/> High Temperature <input type="checkbox"/> UVT Out <input type="checkbox"/> Low UVT <input type="checkbox"/> Low Status <input type="checkbox"/> Remote On/Off <input type="checkbox"/> Outlet Valve Output <input type="checkbox"/> Inlet Valve Output <input type="checkbox"/> Bypass Valve Output <input type="checkbox"/> Lamp/Ballast Failure
To be sent to Atlantium , attach photos of the following with this Checklist <input type="checkbox"/> Atlantium Unit <input type="checkbox"/> Ballast Module(s), Control Module and other components <input type="checkbox"/> Accessories (Flow meter or flow switch, CIP ports, Sampling valves, etc.)
Customer Approval <i>By signing, I hereby declare that the above filled information is correct and nothing prevents the arrival of Atlantium engineer on the designated/agreed date to perform the activation and commissioning.</i> <i>I am aware that lack of water flow or electricity, or any delay providing it and/or major deviation from above filled information, shall incur additional costs and a fully paid additional visit.</i> Name of Customer's authorized representative: _____ Position: _____ Signature of Customer's authorized representative: _____ Date: _____
Atlantium Commissioning Document Atlantium Commissioning Document <input type="checkbox"/> Received



6 Initializing the Atlantium System

The Atlantium system starts up with the initialization of the **Control Module**.

➔ To start up the Atlantium system:

- Step 1.** Check that the power cables of the Ballast Module are all connected to the mains power source.
- Step 2.** Connect the power cable of the **Control Module** to the main power source.
- Step 3.** Using the attached key, open the screen panel of the **Control Module**.
- Step 4.** Locate the circuit breaker [A] in Figure 6-1 and switch it to the **On** position.

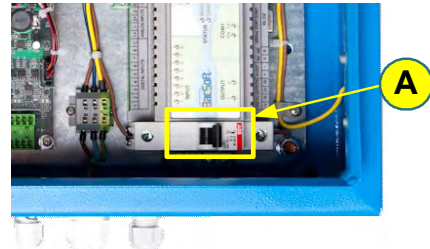


Figure 6-1: Control Module

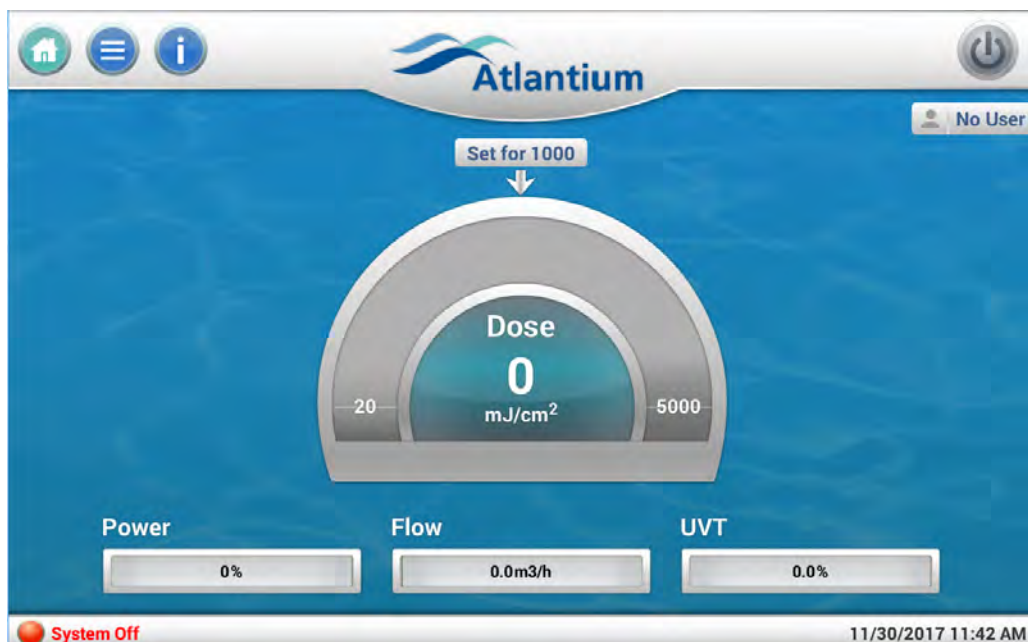


Figure 6-2: Main Operation screen

- Step 5.** Press the Lamp Power button  to ignite system.



7 Configuring the Control Module

7.1 The Control Module HMI

The **Control Module** provides the Human Machine Interface (HMI) for control of operations and dose measurements of the Atlantium system.

The regulations applying to the type of application determine sizing as well as software defaults and operational control options. This is set up at the original manufacturing facility and completed on site by the Atlantium technician.

The **Control Module** provides a real-time display of operational data. A Ready indicator turns green when the system is ready for operation.

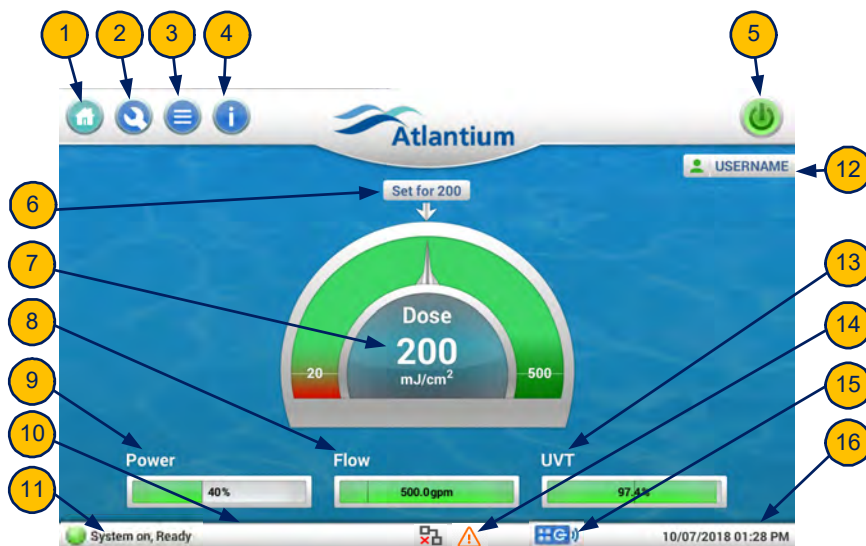


Figure 7-1: Initial Main Operation Screen*

Table 7-1: Control Module Main Screen Details





#	Item	Icon	Description
1	Return to Main screen		To return to the Main screen.
2	Settings Screen Access		To access the Settings screen
3	Event Log Access		To the Events screen.
4	System information Screen Access		Includes the Generic Info tab that displays general system information and lamp status and the Info Monitor tab that displays a summary of system status information.

Table 7-1: Control Module Main Screen Details



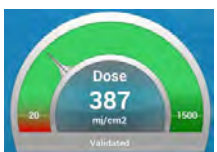
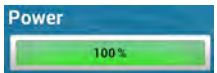
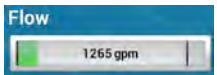

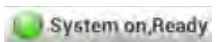

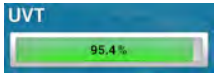


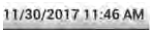

#	Item	Icon	Description
5	Main Unit Operation Button		ON/Off toggle button turns on/off the Atlantium unit components (lamp(s), UV power, etc.) in an orderly sequence.
6	Set For		The user should adjust the Set for dose to the desired operating dose. Confer with your Atlantium Representative, per the original sizing specifications. In some cases, this is 10-20% over the regulated or required dose. In other cases it depends on the variability of local conditions and the best strategy to ensure reliable and effective operation.
7	Dose Gauge		Represents the system dose range. The red area of the gauge represents off-spec low dose. The dark green area represents the user's set maximum allowable dose. The current dose (mJ/cm ²) is displayed in the middle of the gauge. The minimum and maximum allowable dosage levels are user-defined.
8	Power		Scale shows the current Power level.
9	Water Flow		Scale shows the current rate of water flowing through the Unit The scale color changes to red when the flow is either less than minimum flow setting or above the maximum flow setting. When there is no flow the scale goes gray.
10	Bottom Footer		Displays certain system events for a short period of time.
11	Ready LED		Displays the basic system status. When the system is ready for operation (all the lamps are ignited and the dose is above the minimum settings, the system displays the green Ready icon. If the system startup fails or the system is no longer working at or above the minimum dose, the system displays the red icon.
12	User Login		The Login button enables access to the login dialog box and User Management. See Adding Users on page 100.
13	UVT (Transmittance)		Scale shows the amount of UV light transmitted through the water. If the UVT percentage factor is high, the transparency of the water to UV light is high, and vice versa. When there are several UVT sensors in one system, this Scale displays the average of the UVT values measured by each sensor. The Scale color becomes red when the UVT is lower than minimum UVT setting. The color changes even if the UVT alarm is set to None.
14	Event Icons		A relevant icon appears when a critical event occurs. It disappears after the event has been acknowledged in the log.

Table 7-1: Control Module Main Screen Details

#	Item	Icon	Description
15	Remote On/Off indicator		The Remote-On/Off indicator appears if marked in the Signals tab settings.
16	Date and Time		Date and time* are displayed according USA or European conventions <i>*Time may require resetting if the Control Module is disconnected for a week or more and the internal battery runs low (see General Settings on page 96).</i>
17	Lost Network Communications Indicator		This Icon appears when communication is lost.



The specific configuration for your Atlantium system is based on the Application type set for your industry and according to the parameters required for your facility's process.

Configuring the **Control Module** begins with logging in and accessing the Settings screen and follows the general order of the screen components.

7.2 Log In and Password Change

Users may log in, change their password, and reset their password if they forget it.

Users can login to the **Control Module** to access screens according to the permission level assigned to them. When logging on as the Facility Administrator for the first time, use the user name and initial password assigned to you during system commissioning.

Atlantium recommends that the initial Facility Administrator log on with this initial password, then change the password and make a record of the new password in a secure location, in the event that it is forgotten. The Facility Administrator can then define additional users according to facility needs.

For information on adding additional Users and permission levels, see **Adding Users** on page 100.

➔ To login:


- Step 1.** Tap the User Indicator . The Log In dialog box appears.
- Step 2.** From the **User Name** list, select your user name (for first-time use, the user name assigned to you during system commissioning).
- Step 3.** Tap the **Password** field and from the virtual keyboard that is displayed, enter your password (for first-time use, the password assigned to you during system commissioning).
- Step 4.** Tap **Log In**. Your user name appears in the User Indicator box on the upper-right of the main screen.



Figure 7-2: Login Dialog Box

➔ To change your password:


- Step 1.** Tap the User Indicator . The User Administration Tasks dialog box appears.
- Step 2.** Tap **Change Password**. The Change Password dialog box appears.
- Step 3.** In the **Password** field, enter your current password.
- Step 4.** In the **New Password** and **Confirm New Password** fields, enter the new password.
- Step 5.** Tap **Save New Password**. The password is changed.



Figure 7-3: UserAdministration Dialog Box

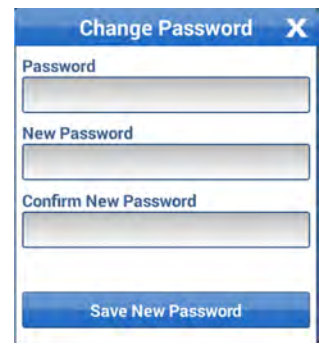


Figure 7-4: Change Password Dialog Box

7.2.1 Login Timeout

To prevent unauthorized system changes, the Control Unit reverts automatically to No User mode 10 minutes after the last tap on the screen by the current user. In the No User mode, system information may be viewed but no changes can be made (see Table 7-2). To make any changes, an authorized user must login again.

7.2.2 If You Forget Your Password

Generally, users with Manager Profile may configure other users and their passwords. If no user with Manager Profile is available, Atlantium Customer Support can help using the following procedure:

➔ To reset your password

- Step 1.** In the Login dialog box, tap **Forgot Password?**. The **Forgot Password** dialog box appears.
- Step 2.** In the **User Name** field, enter your user name.
- Step 3.** Tap **Generate Code**. A code appears in the field below.
- Step 4.** Send the User Name and Code to Atlantium Customer Support.
- Step 5.** In the **Confirmation Password** field, enter the **Confirm Password code** received from Atlantium Customer Support.
- Step 6.** Tap **Reset Password to Default**. The password is reset to the default **1234**. The user should then change it to a secure password.



Figure 7-5: Forgot Password Dialog Box

7.3 The Settings Configuration Screen

The settings screen and individual tabs are visible according to the permission level of the User and are usually accessed during the installation and setup of the Atlantium system and when there are hardware changes made in peripheral equipment.

During normal operations, an authorized facility technician may need to access certain functions, or view certain information, that appears on some of these tabs. For information on which tabs are visible according to permission levels, see **Adding Users** on page 100.



WARNING!

Take care to ensure that the system configuration made via the Settings screen is not tampered with! Unauthorized changes may have a serious impact on the function of the Atlantium system. **Only trained and authorized** facility technicians are to access the Settings screen.



- The Control Module screen images shown in this User Manual are generic. The content of your system screens will vary according to the type of system, the number of lamps, cleaner type etc.
- Screens display values in metric or US units, according to customer localization.
- On completion of each screen, Tap Save to save settings.

- ➔ To access the **Settings** screen: at the top of the screen, tap 

Step 1. The main Settings screen is displayed with the Monitor tab open:

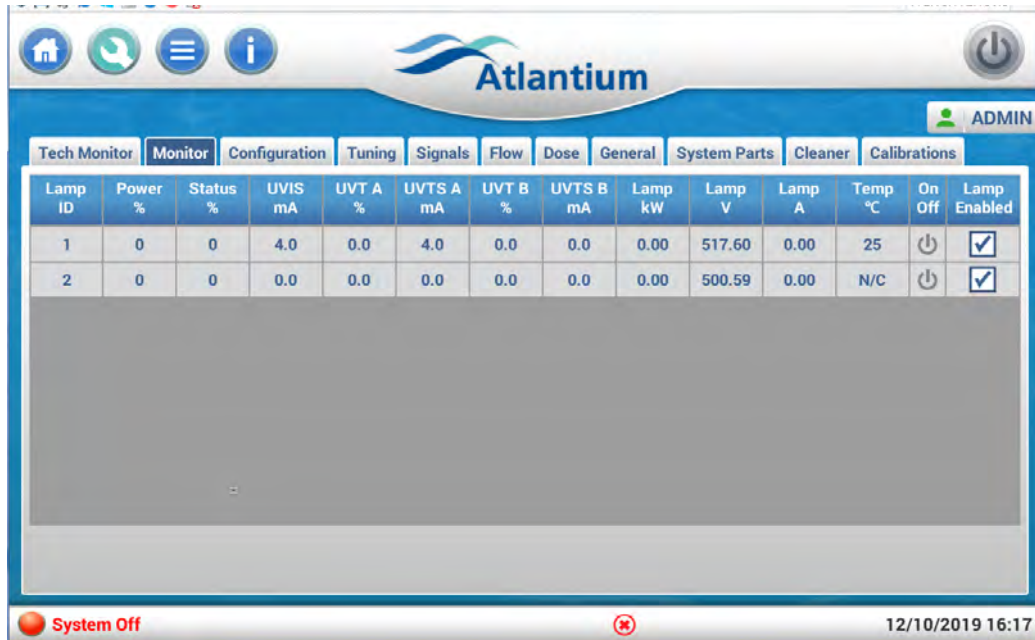


Figure 7-6: Settings Screen, showing Monitor Tab (generic example with 2 lamps)

Step 2. Tap the **Configuration** tab to open it.

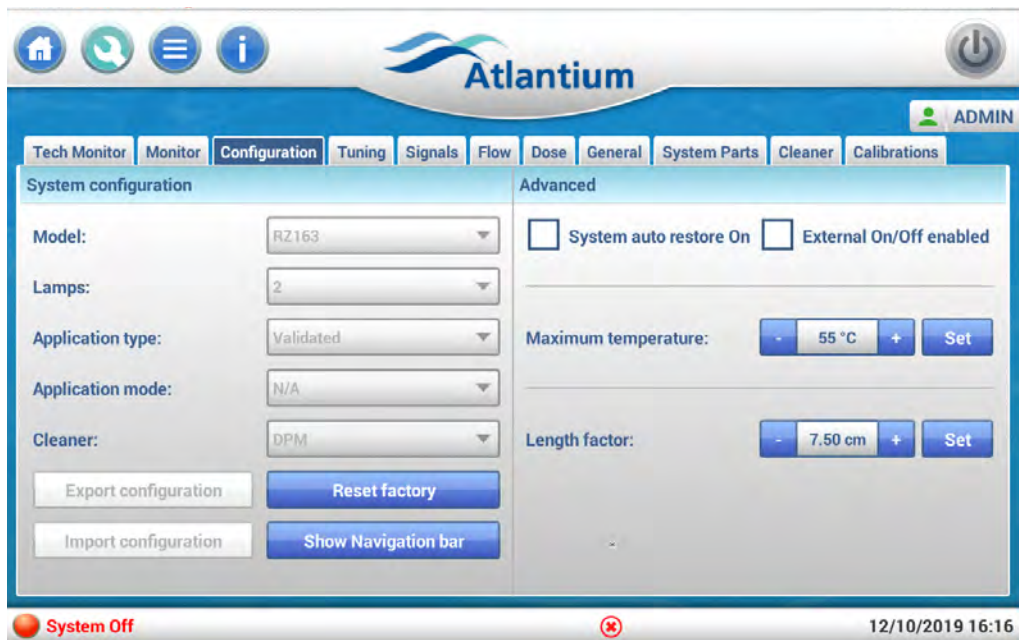


Figure 7-7: Settings Screen, showing Configuration Tab

Step 3. To enable the External On/Off, mark the **External On/Of Enabled** (see **Signal Inputs:** on page 86) checkbox on the R side (**Advanced** Settings).

- **System Auto Restore** - You can also set the Atlantium system to restart automatically when power is restored after a facility-wide power failure, so that it reactivates according to the configured **Auto Power On** settings.

Step 4. To enable System auto restore, mark the System auto restore checkbox.



The **System Configuration** panel on the Left side of the **Configuration** tab is used by the Atlantium technician during system setup to establish basic system parameters, such as Model, number of Lamps, Cleaner type etc. Most of the settings in this tab are not accessible with regular user or administrator privileges, and should **NOT** be changed.

- **Maximum temperature** enables the setup technician to set the maximum permitted temperature for the water in the UV chamber.
- **Length factor** enables the setup technician to set the distance between the UV lamp sleeve and the UVT sensor, through the water.

Step 5. Tap the **Signals tab**. The **Signals Tab** appears.



Figure 7-8: Signals Tab on Settings Screen

7.3.1 Configuring the Signal Settings

The Signals tab displays the settings for the system's dry-contact Input and Output connections: either **Normally Closed (NC)** or **Normally Open (NO)** see Figure 7-8 on page 85.

The following is an explanation of Input and Output signals.

7.3.1.1 Signal Outputs

Inlet valve/System on - The facility's electronically-controlled **Inlet** and **Outlet valves**, that control the water supply to the Atlantium unit, as well as the **Bypass valve** (if a bypass is implemented), must each be configured to receive control signals from the **Control Module**. These valves affect to various facility processes relevant to the Atlantium system, such as:

- Managing high flow conditions
- Bypassing and streaming the water to a different place if the water quality has degraded
- Bypassing for cleaning chemicals that are not compatible with the quartz chambers
- When the system is activated (either manually via pressing the **Operation** button on the **Control Module's** main screen, or via an external signal utilizing the **External On/Off**), the **Control Module** sends a signal, within 10 seconds, that opens the **Inlet valve**. This signal can also be used to provide feedback that the system is activated.
- When the all the lamps are ignited and ready to use, the **Control Module** sends a signal to the **Outlet valve** to open. This signal can also be used to notify that the system is **ready**. The **Control Module** also sends a signal to the **Bypass valve** to close.
- Similarly, when the system is deactivated, (either manually via pressing the **Operation** button on the **Control Module's**, or via an external signal utilizing the **External On/Off**), the **Control Module** sends a signal that closes the **Inlet** and **Outlet valves**, and also opens the **Bypass valve**.

Signals to Alarms - To set off a General Alarm mechanism, such as a flashing light, alarm, bell, or a call or message to a telephone, a system alarm signal must be connected to a SCADA control system. See

General Alarm - requires connection of a General Alarm mechanism to receive a signal from the **Control Module**. Once configured, the alarm is triggered by the signal.

- **High Temperature** - requires connection of a General Alarm mechanism to receive a To connect a mechanism to receive a signal when system temperature has exceeded the configured maximum.
- **Low UVT** - To connect a mechanism to receive a signal when the system's UVT has fallen below the configured minimum.
- **Lost Comm** - When the **Control Module** AIO lost communication with UV unit (all cards disconnected).
- **Shutdown** - To connect a mechanism to receive a signal when an event causes the system to shutdown.

7.3.1.2 Signal Inputs:

- **Flow Switch** - If your system utilizes a Flow Switch, you must configure its electrical polarity in the **Control Module**. For the Flow Meter, see **Configuring the Flow Settings** on page 87.
- **External On/Off** - A switching mechanism to synchronize the Unit with the facility processes. This remote PLC turns the Atlantium Unit on/off. For details about the External On/Off signal wiring, see on page 176. For example, the facility's SCADA (supervisory control and data acquisition) control system can send a signal to the Unit to start or stop its operation as needed. Using this setting, the Atlantium system recognizes this signal and turn the Unit on or off, as appropriate, without the need for manual intervention.



When the **External On/Off** sends a signal to activate the system, the Atlantium **Control Module** sends a response within **10 seconds** that the command was received. If no response is received, it is likely that the **External Operation Button** on the **Control Module** main screen is manually set to the **Off** position. Check this button and if needed manually tap it to reinstate the **On** position, so that the **External On/Off** can control the system activation.

For regular wiring, set according to the table in **External On/Off - Additional Notes** on page 59:

- For **IN+** select **Normally Closed**
- For **IN-** select **Normally Open**
- **Low/Normal Mode** - for systems with an external signal for switching to Low Flow mode.

7.3.1.3 Other Settings

- **Maximum Temperature Warning** - The System shuts down automatically if the water temperature exceeds the maximum set value. You can set the maximum temperature threshold for sending a warning notification that alerts you to take action to prevent the water from reaching the maximum temperature that triggers shutdown. It is recommended to set this threshold to 5% below the maximum water temperature allowed for your system.

- **System Auto Power On** - You can also set the Atlantium system to restart automatically when power is restored after a facility-wide power failure, so that it reactivates according to the configured **Auto Power On** settings.

➔ To configure the Signals settings:

Step 1. At the top of the screen, tap . The **Monitor Tab** is displayed.

The states of the **Outputs** and **Inputs** are set via toggle switches that by default are set to **NC (Normally Closed)**. To change any of them to **NO (Normally Open)**, tap the corresponding toggle switch. It changes to **NO**. Tap again to change it back to **NC**.

Step 2. Under **Output**, set the electrical polarity for:

- **Inlet valve/System On**
- **Bypass Valve**
- **Outlet valve/Ready**
- **General Alarm**
- **High Temperature**
- **Low UVT**
- **Lost Communication** (not implemented in this version)
- **Shutdown**

Step 3. Under **Input**, set the electrical polarity for:

- **Flow Switch** (if installed)
- **External On/Off**

Step 4. To enable the External On/Off, mark the **External On/Of Enabled** checkbox on the Configuration tab (see 7.3. The Settings Configuration Screen, [Step 3.](#)).

Step 5. Tap **Save** to save settings.

7.4 Configuring the Flow Settings

If a flow meter is utilized, the **Control Module** data must be configured to match the flow meter at the time the system is originally commissioned, but may need to be changed if a flow meter is changed, etc. The Max Flow setting provides a threshold to compare to the actual flow rate. If the actual flow rate exceeds this set Max Flow value, the system sends notification and triggers an alarm.

■ About the Low Flow Mode

Set the Atlantium system's response to a low water flow situation via the Low Flow mode. This unique Atlantium feature minimizes the on/off cycles by allowing the system to operate at an extremely low flow value. The Atlantium Application Engineer defines this value according to the specific application. In some cases, this value can be zero flow for a predefined period of time. The **Low Flow Mode** options are:

- ◆ Restart
- ◆ Shutdown

- **Restart** – (Default) This option assumes that low flow is not necessarily a sign of a fault and ensures that the system is ready to come up to full dose or power immediately when the flow rises.

Atlantium allows the system to continue operating at a low or even zero flow rate up to a max time interval, the **Flow Delay**, as defined by the Atlantium application engineer. With this setting, we reduce the amount of on/off and maintain the integrity of the UV operation, while preventing the flow of non-treated water into the line.


- As long as the flow rate stays below the **Min Flow** for less than the amount of time set in **Flow Delay**, the Unit continues to operate in standby mode, generally at the lowest possible power.
- However, if the water flow rate drops below the set **Min Flow** rate for a time that is **longer** than the **Flow Delay**, then:
 - ◆ The **Low Water Flow** warning is triggered

- ◆ The lamps are automatically shut down
- ◆ An event notification is written to the event screen and log file
- The **Restart** mode causes the system automatically restart when the water flow rate returns to a level above the **Min Flow**. The Unit automatically and instantly returns to full operation, without any operator intervention or connection to a higher control level, and without any delay or cool down/ warm up period.

The default values for the minimum flow rate and maximum flow delay appropriate for **Restart** mode are preset by Atlantium. These values may be changed based on local site requirements and conditions, but **be sure to coordinate** with the Atlantium representative.

- **Shutdown** – In this mode, in the event of low flow, which may be a sign of an upstream malfunction, the system shuts itself down in an orderly fashion, but operator intervention is required to start it up again.
 - As long as the flow rate stays below the **Min Flow** for less than the amount of time set in **Flow Delay**, the Unit continues to operate in standby mode, generally at the lowest possible power.
 - However, if the water flow rate drops below the set **Min Flow** rate for a time that is **longer** than the **Flow Delay**, then:
 - ◆ The **Low Water Flow** warning is triggered
 - ◆ The lamps are automatically shut down
 - ◆ An event notification is written to the event screen and log file
- In the **Shutdown mode**, the operator is required to turn on the Atlantium system, once the water is back to the proper Flow rate.

➔ To configure the Flow Meter settings:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **Flow tab**. The **Flow Settings** tab appears. The **Current Flow** indicator displays the current rate of water flowing through the Atlantium system in **GPM** (gal/min) or **M3H (M³H)** units. The **Main Flow Input** indicator displays the **Flow Meter (FM)** or **Flow Switch (FS)** in **GPM** or **M3H (M³H)** units.

For Flow Meter:

- **Flow Meter** appears as the **Main flow input** source,
 - The **Current flow** is displayed on the left.
- Step 3.** Tap **Calibrate** to open the **Flow meter** calibration window



The screenshot shows the 'Flow meter' calibration window. It has a title bar 'Flow meter'. Inside, there are three rows of controls:

mA at 0 flow	- 4.00 +
Flow x100 at 20mA	- 3.00 +
Current flow	140.3 gpm

At the bottom right, there are two buttons: 'Cancel' and 'Save'.

Figure 7-9: Flow meter calibration window



Figure 7-10: Flow Setting Screen - Flow Meter

- Step 4.** For **mA at 0 Flow (Flow Factor)**, to check the calibration of the flow meter, turn off the flow and then check the value for Current Flow. If it is not zero, adjust the value, by using the **-/+** buttons, until the Current Flow value is zero. Then resume the water flow.
 - Step 5.** For **Flow x 100 at 20mA (Offset)**, on the flow meter's datasheet, find the meter's maximum-allowed flow rate.
 - Step 6.** In the **Flow x 100 at 20mA** field, using the **-/+** buttons, enter the meter's maximum-allowed flow rate divided by 100. (e.g. If the value given is 100 m³/h, enter the value 1). Convert GPM values into m³/h values to make this calculation¹.
 - Step 7.** Tap **Save** to return to the **Flow meter** tab.
 - Step 8.** For **Minimum flow**, using the **-/+** buttons, enter a value for the minimum water flow rate threshold. Below this threshold, the system enters **Low Flow Mode**.
 - Step 9.** For **Flow delay**, using the **-/+** buttons, enter a value, in seconds.
- When the flow rate falls below **Minimum flow**. The system then waits for the **Flow delay** period before entering **Low Flow Mode**.
- Step 10.** For **Low flow mode**, tap the arrow and from the drop-down list, select either **Restart** or **Shutdown**.
 - Step 11.** The default value for maximum **Flow Delay** appropriate for **Restart** mode are preset by Atlantium. These values may be changed based on local site requirements and conditions, but be sure to coordinate with the Atlantium representative. If you need to change this value, set the desired value using the **-/+** buttons.
 - Step 12.** For **Maximum flow**, using the **-/+** buttons, enter a value for the maximum water flow rate threshold. If the actual flow rate exceeds this threshold, the system delivers a notification message and triggers an alarm.

1. If the meter's maximum-allowed flow rate is set to gpm (US units), multiply this value in gpm by 0.227 to get the flow rate in m³/h

- Step 13.** To set the action to be performed if the water flow rate exceeds the value set in the **Maximum Flow** field. The options are:
- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
 - **Caution** - One or more caution messages are issued.
 - **Warning** - One or more warning messages are issued.
 - **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm.
- Step 14.** Tap **Save** to save settings.

For Flow Switch:

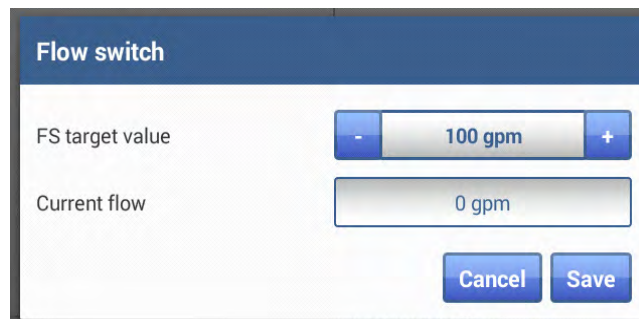
Flow Switch appears as the **Main Flow Input**.

The current flow is displayed on the left.



- A flow switch is used to determine when water flow goes above (Flow) or below (No Flow) a set value.
- Only install a flow switch (instead of a flow meter) in applications where the water flow through the Atlantium system is known to be constant, without significant fluctuations.
- Install a flow switch of recommended type (see **Flow Switch** on page 30).
- These adjustments are to be performed by a qualified Atlantium technician during installation and set-up

- Step 15.** Tap **Calibrate** to open the **Flow switch** calibration window



The screenshot shows a 'Flow switch' calibration window. It has a title bar 'Flow switch'. Inside, there are two input fields: 'FS target value' and 'Current flow'. The 'FS target value' field has a numeric input with a value of '100 gpm' and is flanked by minus and plus buttons. The 'Current flow' field has a value of '0 gpm'. At the bottom right, there are 'Cancel' and 'Save' buttons.

Figure 7-11: Flow switch calibration window

- Step 16.** For FS Target Val, using the -/+ buttons, enter the maximum (and steady) value expected for the flow.

Step 17. Tap **Save** to return to the **Flow switch** tab.

Figure 7-12: Flow Setting Screen - Flow Switch



- Step 18.** For **Min Flow**, using the **-/+** buttons, enter a value for the minimum water flow rate threshold, which trips the flow switch mechanism so that it shows “closed”. Below this threshold, the system enters **Low Flow Mode**.
- Step 19.** For **Low Flow Mode**, tap the arrow and from the dropdown list, select either **Restart** or **Shutdown**.
- Step 20.** The default value for flow delay appropriate for **Restart** mode are preset by Atlantium. These values may be changed based on local site requirements and conditions, but be sure to coordinate with the Atlantium representative. If you require changing this value, for **Flow Delay**, using the **-/+** buttons, set the desired value.
- Step 21.** Tap **Save** to save settings.

7.5 Configuring Dose Settings

The system is set at a particular dose. The Atlantium system maintains the designated dose as conditions allow.

➔ To configure the Dose settings:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **Dose Settings tab**. The **Dose Settings** screen appears.

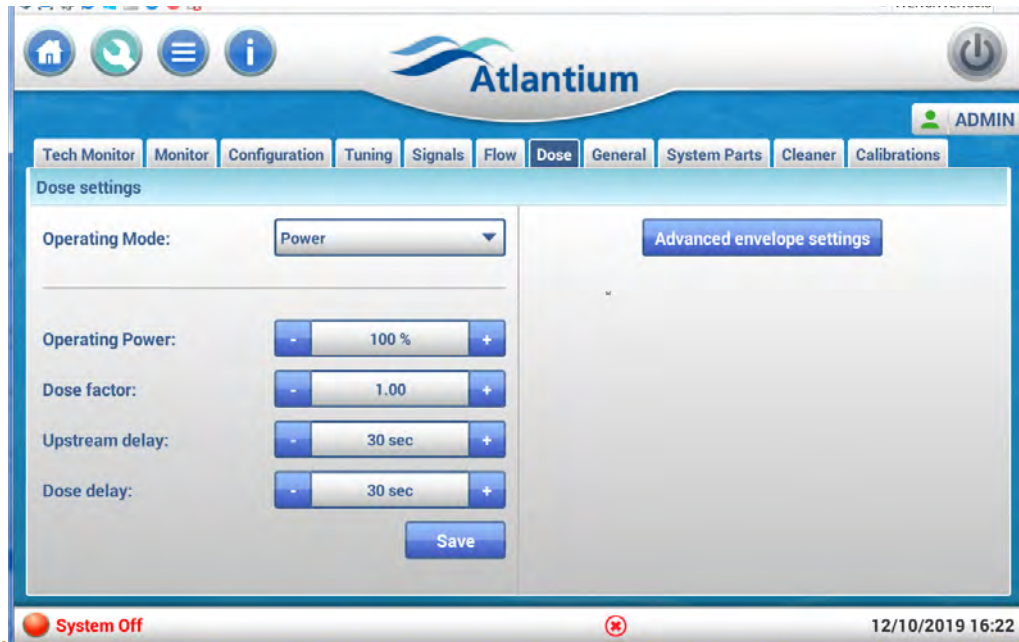


Figure 7-13: Dose Settings Screen - Power Mode

- Step 3.** For **Operation Mode**, tap the arrow and from the dropdown list, select the desired mode:
- **Power mode**
 - **Dose mode**
- Step 4.** In Power mode, use the **-/+** buttons to set the desired power level. The system is set to operate at this power level as a constant. Most operational settings used in Power mode provide information or shut-down the system under specified conditions. The system operates at the prescribed power level and does not change power level to achieve dose settings.
- Step 5.** Tap **Save** to save settings.
- In **Dose mode**, continue with the rest of the settings:

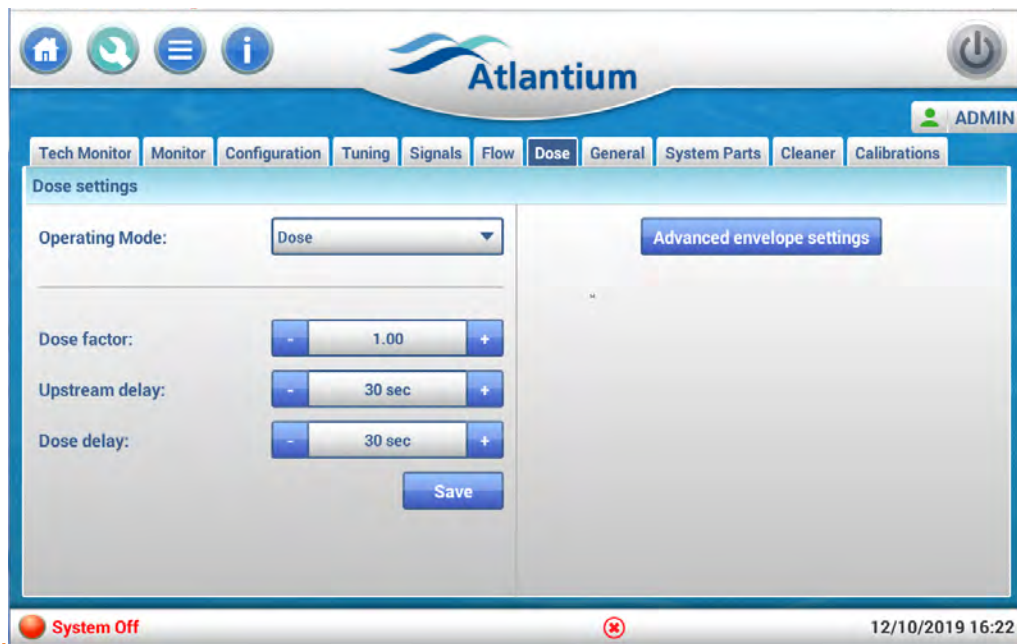


Figure 7-14: Dose Settings Tab- Dose Mode

- Step 6.** For **Minimum Dose Val**, using the **-/+** buttons, set the lowest dose in **mJ/cm²** units under which you want the needle to move to the red zone to send a warning or shut down.
- Step 7.** For **UV Dose Set for**, using the **-/+** buttons, set the general operating dose in **mJ/cm²** units. When the system is operating in that dose range the needle is in the center of the green zone.
- Step 8.** For **Maximum Dose**, using the **-/+** buttons, set the maximum UV dose limit in **mJ/cm²** units, above which you want the system to send a warning or take other action. When the system operates above the maximum dose, the needle is in the dark-green zone.
- Step 9.** For **Action** corresponding to each of the above settings, tap the arrow and from the dropdown list, select the desired corresponding system response in the event that the set power level pushes the dose above or below the set values. The options are:
- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
 - **Caution**- One or more caution messages are issued.
 - **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm.
- The system responds as designated here when, under the current operating conditions and required power level, the dose exceeds or falls below the set values.
- Step 10.** For systems with bypass valve, for **Upstream Delay**, using the **-/+** buttons, set the maximum time it takes for water to pass between the Atlantium system and the bypass valve + 20%. For systems with no bypass valve, set this value to 0.

7.5.1 Calibrations tab

The **Calibrations** screen is used for calibration of UVIS and UVT sensors.

- Step 1.** Tap the **Calibrations** tab. **UVT calibration** and **UVIS calibration** buttons appear.
- Step 2.** Tap either button to start the corresponding calibration procedure. The **Calibrations** tab opens
- Step 3.** Select the check box for each sensor you want to calibrate.

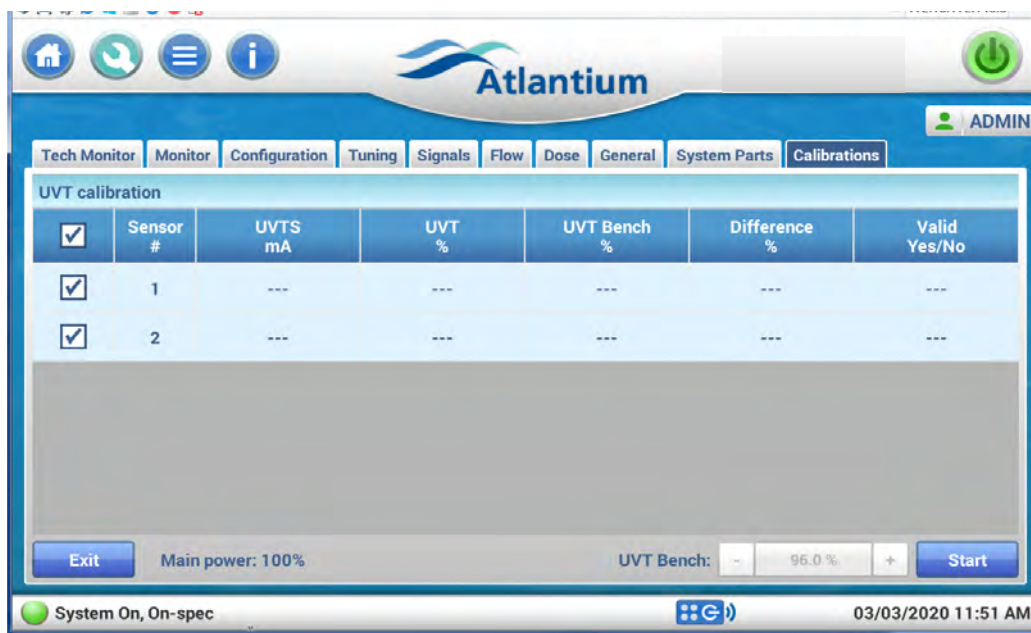


Figure 7-15: Calibrations tab

- Step 4.** For **UVT Bench**, enter the reading from the external calibration sensor (see *Checking/Replacing UVIS Sensors* on page 145 for these maintenance tasks)
- Step 5.** Press Start to start the automatic calibration procedure.
- A time line displays the state of the calibration procedure
- Once calibration is complete, results are displayed in the Calibrations tab.





Figure 7-16: Calibrations results tab

7.6 Configuring the General & Connection Settings

You can set a number of general settings, as well as the connection settings, via the General tab.

The following General Settings are to be configured:

- Date and Time
- Format for units of measurement (US or Metric)
- Maximum Temperature Warning - Since the System shuts down automatically if the water temperature reaches the maximum allowed. You can set the maximum temperature threshold for sending a warning notification so that you can take action to prevent the water from reaching the maximum temperature that triggers shutdown. It is recommended to set this threshold to 5% under the maximum temperature allowed for your system.
- Automatic System Auto Power On in the event of restored power after power failure.
- Assign System Unit identification (PWSID (Public Water System IDentification), Plant, and Train)
- Minimum UVT threshold value for the UV transmission below which the system is to issue an alarm, warning of UVT degradation and the action to be taken accordingly.

The Connection Settings consist of the Modbus node address assigned to this system is configured in the **Control Module**, as well as the appropriate baud rate for this system.

➔ To configure the General & Connection settings:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **General tab**. The **General Settings** screen appears.



Figure 7-17: General tabtab

General Settings


- Step 3.** To set the date and time*, tap . The **Set Date And Time** dialog box appears.
- Step 4.** Swipe the date and time elements to toggle to the correct settings.
- Step 5.** Tap **Set**. The correct time appears on the **Output/Input** Tab and is set for the system.



Figure 7-18: Set date And Time Dialog Box

Depending on the format selected (see below) the Metric format is day first and a 24-hour clock and the US format is month first AM/PM.

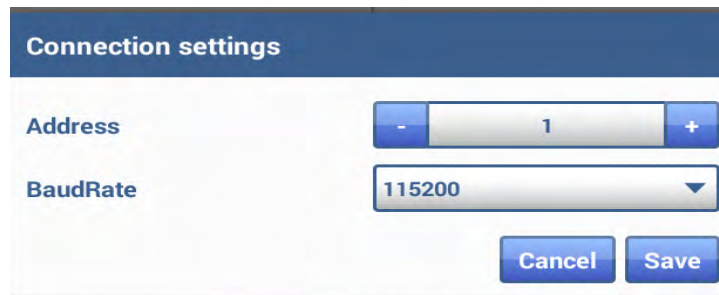
**Time may require resetting if the Control Module is disconnected for a week or more and the internal battery runs low.*

- Step 6.** To select the **Units format**, tap the arrow and from the dropdown list and select the desired format, imperial for **US** units or **Metric** for metric units.
- Step 7.** When the maximum temperature threshold is reached, a warning notification is sent so that you can take action to prevent the water from reaching the temperature that triggers shutdown. For setting the maximum temperature:
- Set the system water flow to the minimum possible.
 - Wait a few minutes for the system to stabilize.
 - Check the **Control Module's** Monitor screen's temperature reading.
- Step 8.** Under **Maximum temperature**, using the **-/+** buttons, set the maximum temperature threshold to the temperature reading in **Step 7/c** above plus **5°C/41°F**. When this threshold is reached, a warning notification is sent.
- Step 9.** To enable the system to restart automatically when power is restored, mark **System auto restore On** checkbox.

- Step 10.** For each Unit defined in you system configuration, you can assign the PWSID, Plant, and Train identification. From the **Unit Number** dropdown list, select the Unit number to be identified.
- Step 11.** For **PWSID**, **Plant**, and **Train**, tap the field. A virtual keyboard appears. Use it to enter the appropriate identification.

Connection Settings

- Step 12.** Tap Connection settings to open a settings window:



- Step 13.** For **Address**, using the **-/+** buttons, set the Modbus address node assigned to this system as a slave while the remote PLC is the Master.
- Step 14.** For **Baudrate**, select the appropriate baud rate for this system. The options are:
- 115200
 - 57600
 - 38400
 - 19200
 - 9600

Minimum UVT

- Step 15.** For **Minimum UVT**, using the **-/+** buttons, set the threshold value for the UV transmission below which the system is to issue an alarm, warning of UVT degradation.
- Step 16.** For **Action**, from the dropdown list, select the action to be performed if the factor falls below the Min UVT and becomes off-spec. The options are:
- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
 - **Caution** - The caution alerts you to an anomaly based on the user preferences.
 - **Warning** - One or more warning messages are issued. \
 - **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm.

7.7 Configuring the Cleaner

If your system includes a cleaner, it is pre-configure to run automatically (Enabled) according to a frequency that you can also configure.

➔ To configure the cleaner:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **Cleaner tab**. The **Cleaner** screen appears.

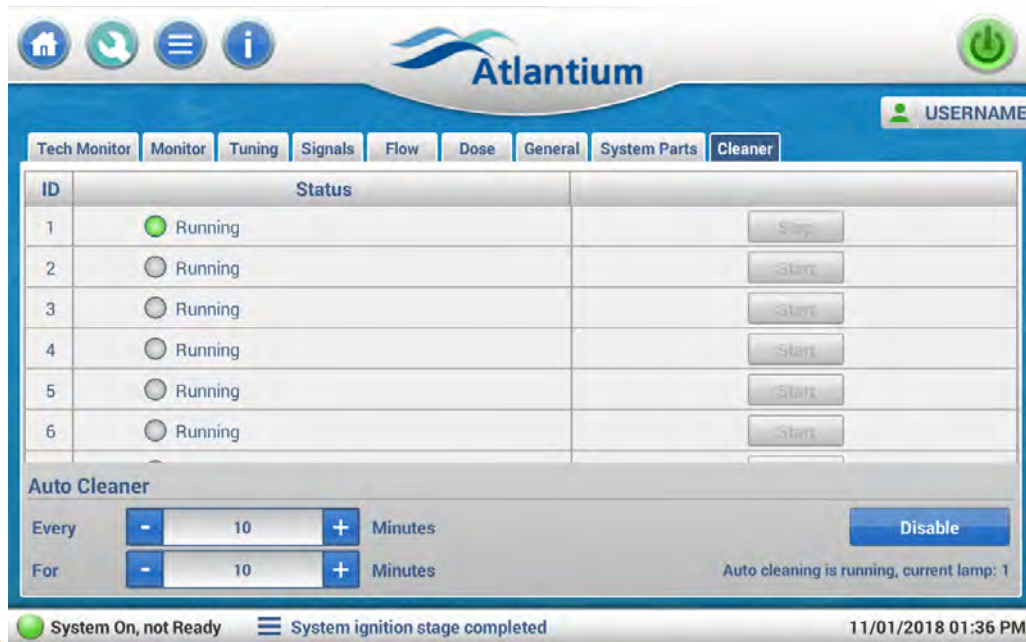


Figure 7-19: Cleaner Screen

Step 3. At the bottom of the screen, under **Auto Cleaner**, for **Every**,

Step 4. To set the duration of the cleaning process, for **For**, using the **-/+** buttons, set the duration in minutes.

7.7.1 Disabling the Cleaner

If needed, you can disable the cleaner.

➔ To disable the cleaner:

Step 5. At the bottom-right of the screen, tap **Disable**, the cleaner is disabled.

7.8 Importing/Exporting a System Configuration

After setting up a system configuration in the **Control Module**, you can export it to save as a backup or to use for configuring additional **Control Modules** by importing a saved system configuration.

7.8.1 Exporting a System Configuration

You can export a system configuration.

Prepare the following:

- USB Drive

➔ To export a system configuration:

Step 1. At the top of the screen, tap . The **Monitor Tab** is displayed.

Step 2. Tap the **General tab**. The **General Settings** tab appears.



Figure 7-20: General tab

- Step 3.** Open the **Control Module** and on the back of the door, insert the USB drive into one of the USB ports at the top of the circuit board, as shown in the figure below.



Figure 7-21: Control Module USB Port Location

- Step 4.** On the **General tab**, tap **Export Configuration**. The system configuration is copied to the USB drive. confirmation appears.
- Step 5.** Remove the USB drive and keep it in a safe place.


7.8.2 Importing a System Configuration

You can import a system configuration.

Prepare the following:

- USB Drive containing a saved system configuration

➔ To import a system configuration:




- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **General tab**. The **General Settings** tab appears.
- Step 3.** Open the **Control Module** and on the back of the door, insert the USB drive (containing the saved system configuration) into one of the USB ports at the top of the circuit board, as shown in Figure 7-21 above.
- Step 4.** On the **General tab**, tap **Import Configuration**. A popup appears asking you select the source.
- Step 5.** Tap **USB Flash**. The system configuration is copied to the **Control Module**.
- Step 6.** You are prompted to restart the **Control Module**. Tap **Yes**. The **Control Module** restarts with the imported system configuration.

7.9 Adding Users


Typically, the designated facility manager defines user names for the relevant personnel. However, each User can add addition Users with the same authorization type or in the hierarchy under him/her.

All-In-One screen access is according to the table below.

Table 7-2: User Hierarchy and Permissions

Section	Screen	Manager	Operator	No User Logged On
	Event Log	X	X	X
	System Info	X	X	X
	Monitor	X	X	X
	Lamps	X	X	
	Monitor	X	X	
	General	X	X	
	Cleaner	X	X	
	Tech Monitor	X		
	Tuning	X		
	Signals	X		
	Flow Setting	X		
	Dose Settings			
	Settings System Parts	X		

➔ To add a User:

- Step 1.** Tap the User Indicator . The User Administration Tasks dialog box appears.

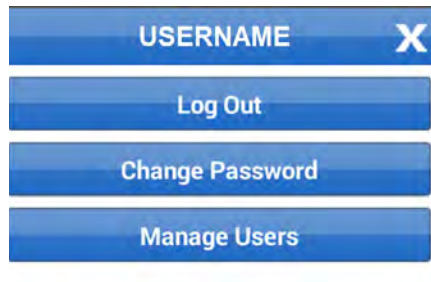


Figure 7-22: User Administration Tasks Dialog Box

Step 2. Tap **Manage Users**. The Manage Users dialog box appears.



Figure 7-23: Manage User Dialog Box

Step 3. Tap **Add User**. The Add User dialog box appears.

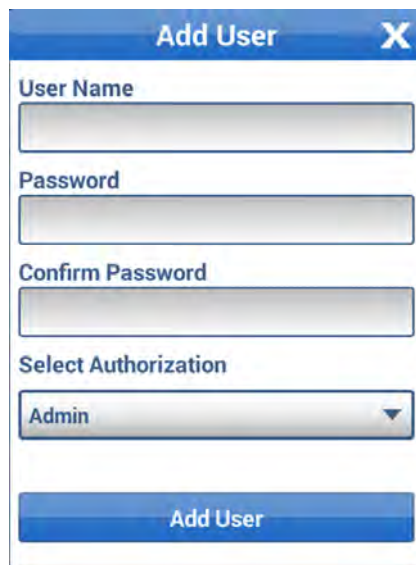



Figure 7-24: Add a User Dialog Box

- Step 4.** Tap the **User Name** field. A virtual keyboard appears. Type in the user name.
- Step 5.** Tap the **Password** field. A virtual keyboard appears. Type in the password.
- Step 6.** Tap the **Confirm Password** field. A virtual keyboard appears. Type in the same password to confirm it.
- Step 7.** From the **Select Authorization** dropdown list, select the desired User type
- Step 8.** Tap **Add User**. The new User is added to the system and appears on the list of Users.

7.10 Editing/Deleting Users

Each User can reset the password to the default password **1234** of Users with the same authorization type or in the hierarchy under him/her or delete any of those Users.

➔ To edit/delete a User:

Step 1. Tap the User Indicator . The User Administration Tasks dialog box appears.

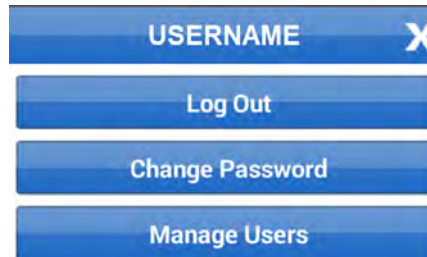


Figure 7-25: User Administration Dialog Box

Step 2. Tap **Manage Users**. The Manage Users dialog box appears.



Figure 7-26: Manage User Dialog Box

Step 3. From the **Select User** dropdown list, select the desired User. The Manage User dialog box appears displaying additional options.



Figure 7-27: Add a User Dialog Box

Step 4. To Reset the password of the selected User, tap **Reset Password To Default**. The password is reset to **1234**.

Step 5. To delete a User, tap **Delete User**. The User is deleted.



8 First Time System Activation

Following **Control Module** configuration, completing the system commissioning includes the following major steps:

- Cleaning the Atlantium Unit (See below)
- Filling unit with water (See below)
- Igniting the UV Lamps (See below)
- Initiating the Water Flow (See page 105)
- Adjusting the Auxiliary Equipment (See page 105)
- System Tuning (See page 105)
- Installation QA (See page 105)

8.1 Cleaning the Atlantium Unit

The inner surfaces of the Atlantium Unit are to be cleaned via the CIP process at installation, before starting up and proceeding with the commissioning phase. Follow the directions in **Cleaning In Place (CIP)** on page 100.

8.2 Filling unit with water

The unit must be filled with water before full activation.

Water hammer can cause damage to any hydraulic system, including the Atlantium Unit. **Make sure that water hammer is NOT present in your facility's water line.**



To prevent water hammer, consult your system engineer and check your facility system procedures, including:

- When starting the water flow when the lines are empty, keep valves open so that the air in the pipes has a simple release pathway.
 - Sudden valve closures can cause water hammer. Make sure that valves close gradually enough to avoid this problem.
 - Ensure that all pumps used with the Atlantium system employ soft start-up procedures.
-

➞ To introduce water:

Step 1. Open the **Inlet valve** and, using the **Viewport** on the Unit, check that the quartz chamber fills with water completely.


8.3 Igniting the Lamps

The lamps of the Atlantium Unit are ignited to commence live system operation.



- **Temporarily, the breather caps on the lamps must be left open to allow any condensation water to evaporate. During this time, set up Caution floor signs at a distance of 1m/40inch from the Atlantium Unit to warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.**
 - Wear white cotton gloves.
 - Wear long sleeves rolled down to your wrist.
 - Where appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
 - **DO NOT look directly into openings that emit UV light.**
-

➔ To ignite the lamps:

Step 2. In the **Control Module**, log in and at the top of the screen, tap . The **Monitor Tab** is displayed.



The screenshot shows the Atlantium Monitor Screen. At the top, there's a header with the Atlantium logo and a 'USERNAME' field. Below the header is a navigation bar with tabs: Tech Monitor, Monitor (selected), Tuning, Signals, Flow, Dose, General, System Parts, and Cleaner. The main area displays a table with 8 rows of lamp data. At the bottom, there's a status bar showing 'System On, Ready' and the date/time '10/07/2018 01:25 PM'.

Lamp ID	Power %	Status %	UVT %	UVIS mA	UVTS mA	Lamp kW	Lamp V	Lamp A	Temp °F	On Off	Lamp Enabled
1	100	100	97.0	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
2	100	99	97.1	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
3	100	99	0.0	17.8	0.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
4	100	99	97.1	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
5	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
6	100	100	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
7	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
8	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>


Figure 8-1: Monitor Screen*

** This screen (as well as all screens shown in this manual) is a generic example. The number of lamps shown on the actual screen are configured according to the number of lamps in your Atlantium Unit.*

Verify that all of the lamps in your system are enabled - check box appears filled .

Step 3. Post temporary Caution signs on the ground 1 m away from the Atlantium unit to warn bystanders of possible UV light exposure and require the use of appropriate skin and eye protection to approach.

Step 4. Open each of the lamp vent caps (2 on each side of the lamp). For the location of the lamp vent caps, see Figure 10-14 on page 138.

Step 5.  Check that the Main screen shows that system is working properly according to spec (see Figure 8-2)

Step 6.  Let the system operate for at least one hour.

Step 7. Continue with Section 8.5 below while the lamps complete the first hour of operation.

Step 8. After that first hour, close all of the lamps' breather caps and remove the Caution floor signs.

8.4 Initiating the Water Flow

When initiating the water flow, the water may be set to drain out or collect in a tank until the system is fully operational. Once the entire installation and QA testing is complete, the water is set to flow normally as part of the facility operation.

➔ To initiate the water flow:

Step 1. Open the relevant valve that allows water to flow through the Atlantium unit. This may be the draining valve or bypass valve.

Step 2. Open the viewport and verify that the Unit is completely filled with water and that no air gaps and no air bubbles exist.

On the **Control Module**, verify that the Flow reading on the right is within normal range. If it is not, check the connections between the Atlantium system and the Flow meter. See **Control Module Connections** on page 56.

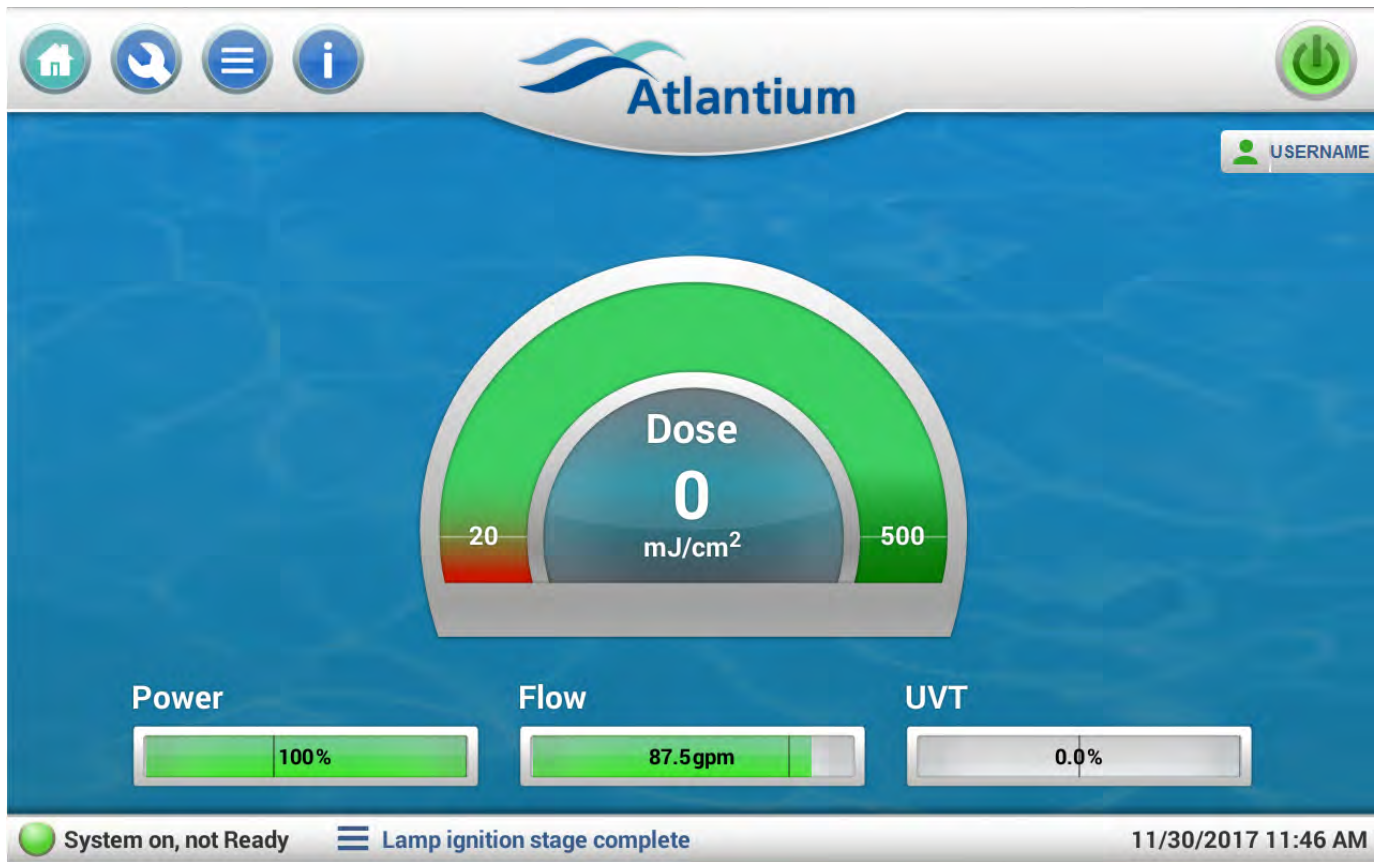


Figure 8-2: Main screen showing on-spec system (generic)

8.5 Adjusting the Auxiliary Equipment

All relevant auxiliary equipment, i.e., flow meter, automatic valves, PLC, etc., must be adjusted at this time. Refer to the manufacturers' user documentation of the relevant equipment.

If your configuration includes a flow meter, check that the value of the flow displayed on the **Control Module** matches the reading on the flow meter. For flow meter calibration, see **Configuring the Flow Settings** on page 87.

8.6 System Tuning

The Atlantium system must be tuned via the **Control Module**. Follow the instructions in **Replacing/Checking a UVT Analyzer or UVIS Sensor** on page 129.

8.7 Installation QA

Atlantium personnel performs a quality assurance procedure (see **Installation Check List** on page 76) following which the Atlantium system is ready for regular facility operation.



9 Operating the Atlantium System

This section details how to operate the system and handle basic and periodic routines to be carried out by Atlantium trained local staff.

For system without optional **Ultrasonic Cleaning system**, disregard the irrelevant sections.



WARNING!

- Unauthorized servicing or modification of this system in a manner not specified in this manual could expose personnel to potential electrical or other hazards.
- Improper use or adjustment of this system may invalidate the service warranty agreement.

9.1 Operational Guidelines

Follow these guidelines for smooth Atlantium System operations:

- **Incoming Water Supply** - Be alert about incoming water supply. If you do not have pre-treatment, be alert to reports of contamination by upstream slugs of mud, particles, oil, etc.
If the water source was not previously in operation or the line is new, - flush the line prior to introducing water into the Atlantium system
- **Avoid chemicals that are harmful to UV systems** - Avoid caustic soda and other corrosive chemicals that can degrade gaskets and O-rings. For information on approved chemicals for CIP use, see **Selecting the Correct Chemicals for CIP** on page 116
- **Prevent Water Hammer** - Water hammer can cause damage to any hydraulic system, including the Atlantium unit. Take steps to ensure that this phenomenon does not occur in your facility's water line. To prevent water hammer, consult your system engineer and check you facility system procedures for following:
 - Avoid filling empty lines with water without keeping valves open for releasing the air from the pipes and the system.
 - Avoid rapid closure of water lines by sudden closure of valves.
 - Before introducing the water, ensure that all pumps that impact the Atlantium system employ soft start-up procedures.
- **Avoid vibrations on upstream and downstream piping** - Make sure that the piping to be attached to the Atlantium Unit is reinforced to protect the Unit against vibration.
 - A high vibration level can cause damage to any hydraulic system, including the Atlantium unit.
 - High vibration can be caused by an unbalanced pump or by sudden valve close.
- Do not leave the Atlantium Unit filled with stagnant seawater for a long time. Either rinse with fresh water and leave the Atlantium Unit standing with fresh water, or empty. Leaving the Unit empty is a less preferable option, since when refilling the system you must avoid air collection in the Unit and avoid water hammer, as mentioned above.


9.2 Basic Operational Tasks

- Shutting down the Atlantium system - See below
- Starting up the Atlantium system - See page 107
- Taking microbial samples - See page 113

9.2.1 Shutting Down the Atlantium System

You can shut down the Atlantium system via the **Control Module**.


➔ To shut down the Atlantium system:

- Step 1.** In the **Control Module**, on the top of the screen, tap . The button turns grey . . Wait approximately three minutes for the **Lamps Off** signal to transmit.
- Step 2.** Check the **Main Operations** screen and verify that the system parameter for **Power** is **0%**.
- Step 3.** Using the viewport on the Atlantium Unit, check that the lamps are indeed turned off.

9.2.2 Starting up the Atlantium System

You can start up the Atlantium system via the **Control Module** and then check the water and system parameters.

➔ To start up the Atlantium system:

- Step 1.** Check that the power cable of the Ballast Modules is connected to the main power source.
- Step 2.** Connect the power cable of the **Control Module** to the main power source.
- Step 3.** Using the attached key, open the screen panel of the **Control Module**.
- Step 4.** Locate the circuit breaker and turn it to the **On** position.
- Step 5.** In the **Control Module**, on the top of the screen, tap . The button turns green. Wait 10 minutes for lamps to turn on and the system to stabilize.
- Step 6.** Open the viewport and check that there are no air bubbles in the water flow. If necessary, release all air bubbles from within the system.
- Step 7.** Check the **Control Module** Screens (See *Configuring the Control Module* on page 58.) and verify that the Atlantium system parameters for **Power**, **Flow**, and **UVT** are within wanted acceptable range (see the table below to enter your expected values).

Notify the executive maintenance engineer in case the values are out of range.

Table 9-1: Abbreviation of Table in Appendix B. Checking the System Parameters

	Parameter	Expected Value	
		Minimum	Maximum
1	Power		
2	Flow Rate		
3	UVT		
4	UV Dose		
5	Lamp Status		




For periodic checks on Atlantium system parameters, a convenient check list is supplied in Appendix B, *Checking the System Parameters* on page 187.

9.2.3 Viewing System Information

You can view general information about the system in the **System Info** screen.

➔ To view generic System information:

At the top of the screen, tap . The **System Info** screen is displayed, containing the following information:

- Power in % of maximum power
- Status in % (Average lamp status, relative to output of a new lamp)
- UVT in %
- Flow in m³/h
- Temperature
- Dose in gpm or h³/m
- Software version (of the **Control Module**)
- ISO version (of the **Control Module** card)
- IP Address (Optional for connecting to the Control Module via remote PC to generate history Excel files)
- External Storage (SD card for backing up system data, i.e., event log, system configuration, system parts info, history)

Total Space GB

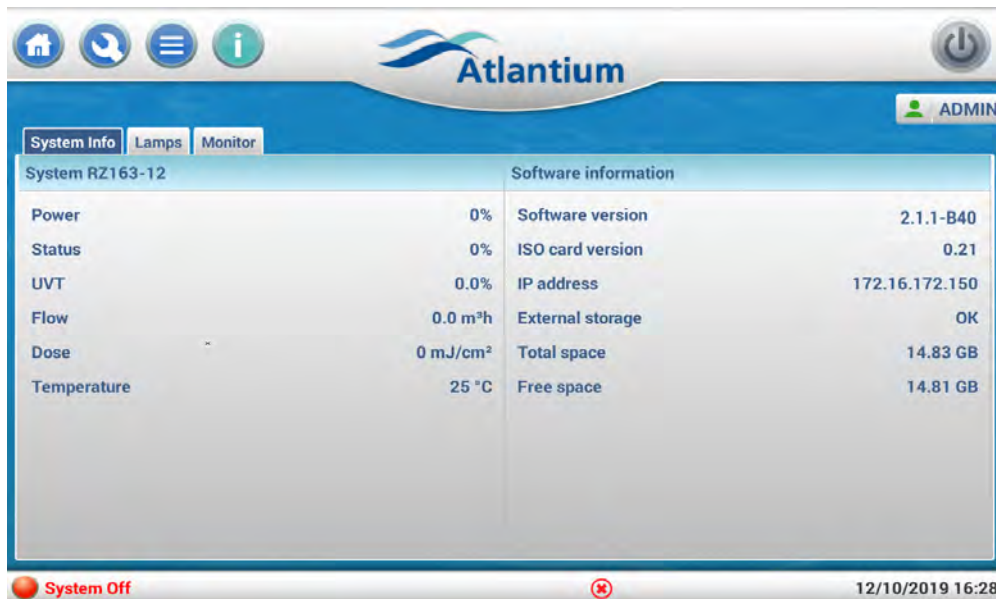



Figure 9-1: System Info Screen

9.3 Viewing Lamp Information

You can view information about the lamps in the **Lamps** screen.

➔ To view information about the Lamps:

- Step 1.** At the top of the screen, tap . The **System Info** screen.
- Step 2.** Tap the **Lamps** tab. The Lamps screen is displayed, containing the following information:

- ◆ Lamp ID
- ◆ Status in % (lamp status, relative to output of a new lamp)
- ◆ Age in hours
- ◆ Number of ignitions
- ◆ State: On, Ignition, or Off

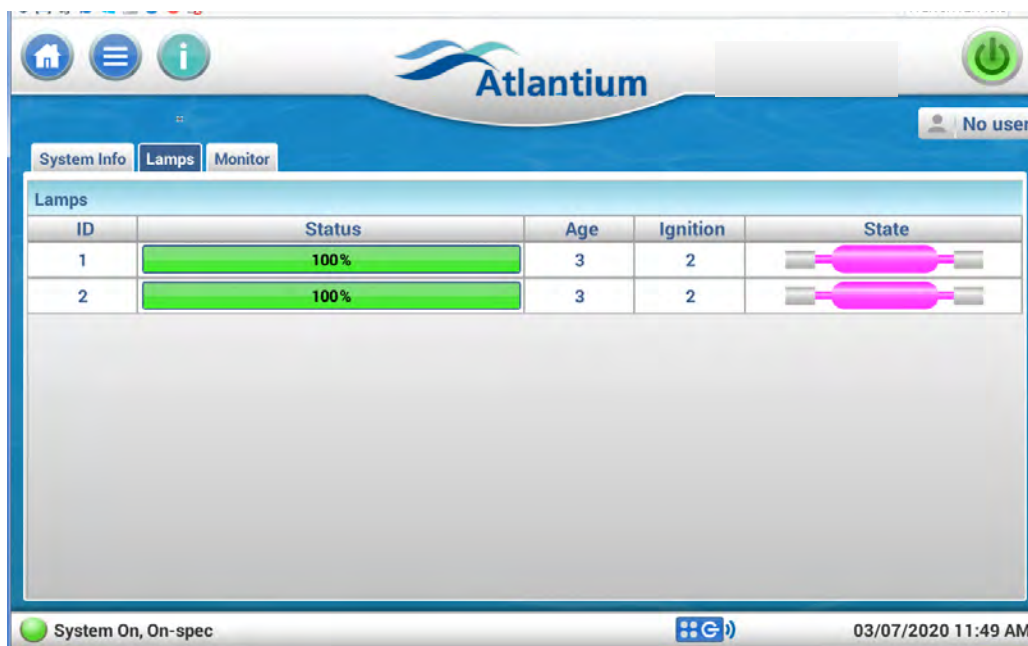



Figure 9-2: Lamps Screen

9.4 Viewing the System Monitor

You can view information about the system status in the **Monitor** screen.

➔ To view the System Monitor:

- Step 1.** At the top of the screen, tap . The **System Info** screen.
- Step 2.** Tap the **Monitor** tab. The Monitor screen is displayed, containing the following information:
- Lamp ID - The ID number of the lamp.
 - LM Card SW - The software version of the Connection Box card to which the lamp is connected.
 - Power % - The Power supply's power in percentage.
 - Status % - The Real time efficiency status of the lamp in percentage.
 - UVT% - The quality of the UV transmittance through the water in percentage.
 - UVIS mA - The output current of the UV Intensity Sensor adjacent to the lamp
 - UVTS mA - The output current of the UV transmittance sensor through the water
 - UVT A, UVT B % - Quality of transmittance measured by two separate sensors (RZM systems)
 - UVTS A, UVTS B mA - The output current of the 2 separate UV transmittance sensors (RZM systems)
 - Lamp kW -
 - Lamp V -
 - Lamp A -
 - Temp - The lamp's temperature reading in either °C or °F.

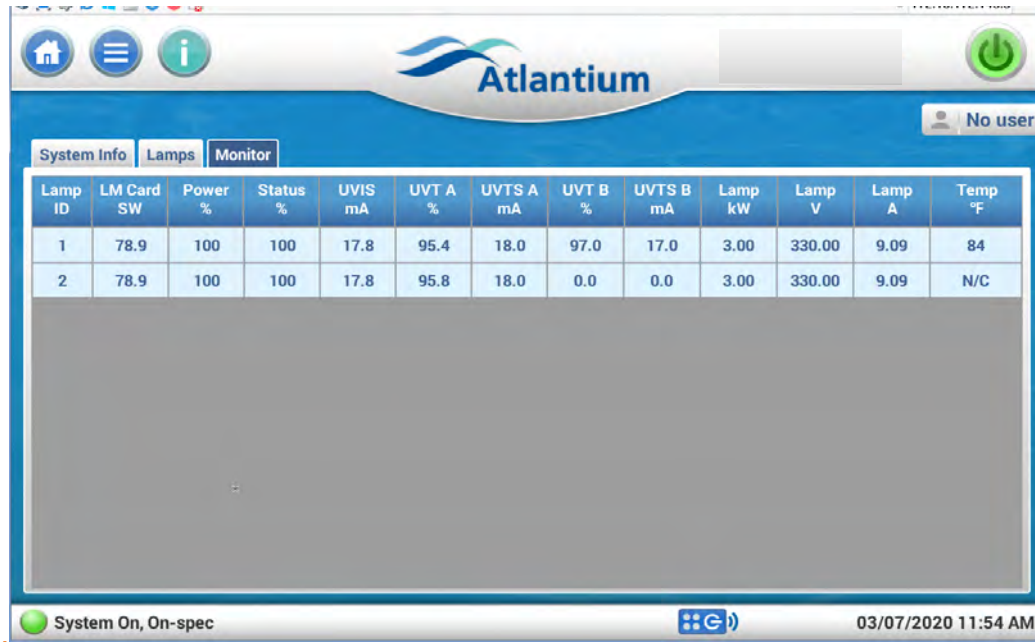


Figure 9-3: Monitor Screen

9.5 Viewing the Alarm Log

Every defined event /alarm is written to the Alarm Log of the **Control Module**. alarms with alerts also trigger an alert icon at the bottom of the screen. You are can acknowledge each alarm or acknowledge all together.

➔ To view the alarm log and acknowledging alarms:

- Step 1.** At the top of the screen, tap  the **Alarm Log** screen is displayed.
- Step 2.** To navigate through the log, swipe down the Event list.



Figure 9-4: Event Log Screen

- Step 3.** To view more information about a single alarm, tap the alarm. The alarm item expands to display the full information, including reading for System Power, Dose, Flow, Status, UVT, and Temperature at the time the alarm occurred. When expanding an alarm with an alert, the alert is acknowledged, and relevant icons at the bottom of the screen disappear.
- Step 4.** To acknowledge all alerts, tap the **Acknowledge all** button. The relevant icons at the bottom of the screen disappear.



Figure 9-5: Event Log Screen - Event Information Examples

9.6 Taking Microbial Samples

The designated aseptic sampling valves (i.e., EGMO ESV valves) are the **Inlet** and **Outlet Sampling Points** located on the sides of the Atlantium Unit. Before taking a microbial sample, a valve is sterilized internally with Ethanol 70%, as well as with flame.

Required Equipment

- Sampling containers that are clean, laboratory-grade, sampling bottles with a volume no less than 100ml (3.38oz).
- Ethanol 100-70%
- Bunsen Burner and lighter
- Permanent marker
- Sterile gloves
- Proper Sampler attire according to local laboratory protocol



CAUTION!



- Use gloves during sampling and treat them with Ethanol 70%.
- Use **sterile disposable** sampling containers.
- Prevent contact between the sampling containers and the valves' surfaces.
- Be sure that no foreign matter or liquids fall into the sampling containers.
- Perform the sample collection as fast as possible to minimize environmental contamination of the sample.
- **Use open flame to treat the surrounding air while sampling.**

➤ To take a microbial sampling:

- Step 1.** Open the Sampling valve and allow water to flow for 2-3 minutes. Then close the valve.
- Step 2.** If the sampling valve contains a cover at the top, open its cover and place it in a clean place.
- Step 3.** Spray all over the Sampling valve and inside it thoroughly with Ethanol 70%.
- Step 4.** Using a Bunsen burner, apply the flame comprehensively over the entire Sampling valve surface from its connection to the main pipe to its spout.
- Step 5.** Spray the cap thoroughly with Ethanol 70% and place it on the Sampling valve.
- Step 6.** Open the valve and allow the water to flow for 2 minutes. If you have applied the flame properly, vapor emerges from the spout. (If there is no vapor, application of the flame was insufficient. Repeat the previous step.)



Figure 9-6: Cleaning the Sampling Valve with Ethanol

ATTENTION!

Make sure never to touch the opening at the Sampling container's neck.
While the Sampling container is open, do not turn the cap upside down.

- Step 7.** On the Sampling container, with one hand, remove its cap carefully, avoiding touching the inside of the cap with fingers or any other object. **Do not turn the cap upside down.**
- Step 8.** With your other hand position the Sampling valve under the water stream and take a water sample. Make sure never to touch the valve's opening or the opening at the container's neck. Fill the sampling container, leaving ample air space in bottle (at least 2.5 cm).
- Step 9.** Carefully replace the container's cap and tighten it to avoid cross contamination.



Figure 9-7: Taking a Sample

- Step 10.** Label the Sampling container with the following data:
- Sampling site
 - Sampling point
 - Sampler name
- Step 11.** Close the Sampling valve.
- Step 12.** Spray the sampling container thoroughly with Ethanol 70%.
- Step 13.** Store the water samples in a dark, refrigeration unit at a temperature of 2-8°C (35.6-46.4°F) until they are examined.

9.6.1 Microbial Analysis Guidelines

The microbial analysis is to be conducted according to the company guidelines which are used in the local microbiology laboratory.

- Atlantium's recommendation is to use the microbial filtration method for the testing.
- If a number of consecutive anomalous microbiological results are obtained in one of the sampling points, take the samples only after performing CIP with a disinfection chemical (peracetic acid is recommended). It is important to let the chemicals clean and sanitize the aseptic valves, by letting the cleaning solution flow through them. See **Cleaning In Place (CIP)** on page 116.
- In the event that system outlet counts are higher than the inlet counts, the results are to be considered as a sampling error.
- In the event that the microbial counts are not proportional in different dilutions, the results are to be considered as a laboratory error.

For further guidance regarding microbial sampling and analysis, contact the Atlantium Application department

9.7 Ultrasonic Cleaning (Optional)

For systems with the optional Ultrasonic Cleaning System, for whatever reason, you may want to manually disable the Ultrasonic Cleaner. Using the manual control temporarily overrides the configured settings. Manually reenabling resumes the ongoing automatic Ultrasonic Cleaning cycles as pre-configured in the settings.

➡ **To run the Ultrasonic Cleaner from the Controller:**

- On the **Control Module** main screen, press the cleaner icon . The Ultrasonic Cleaner is activated/deactivated. Activation is for the duration set for this function.



10 System Maintenance

To keep the Atlantium system in peak form, preventive and periodic routine maintenance is essential. During commissioning, Atlantium trains your local staff how to do the tasks on a prescribed schedule or as needed.



WARNING!

- Unauthorized servicing or modification of this system in a manner not specified in this manual could expose personnel to potential electrical or other hazards.
- Improper use or adjustment of this system may invalidate the service warranty agreement.



Before you begin a procedure, carefully read through it so that you can anticipate the steps efficiently.

The periodic routine maintenance schedule includes:

- Weekly Maintenance Tasks:
 - Walk-Around Inspection Tour - see below
- Monthly Maintenance Tasks:
 - Checking the Ballast Module(s) Cooling Fans (if relevant)
 - Checking the Temperature Sensor Reading (See page 128)
- Yearly Maintenance Tasks:
 - Cleaning the Quartz Sleeve (or Replacing as needed) and Replacing the Quartz Sleeve O-rings (See page 141)
 - Anti-Corrosion Maintenance (***Anti-Corrosion Spray Safety*** on page 40)
- Maintenance Tasks Performed as Needed:
 - Cleaning In Place (CIP) (See page 116)
 - Resetting the Cleaner Counter (See page 125)
 - Replacing a Lamp (See page 129)
 - Checking/Replacing a Sensor (See page 145)
 - Testing System Lamps (See page 150)
 - Tuning the Atlantium System (See page 151)
 - Checking/Replacing the Quartz Sleeve (See page 141)
 - Cleaning/Replacing a UVIS Wave Guide (See page 138)
 - Replacing/Editing System Parts in the **Control Module** (See page 133)
 - Temperature Sensor Maintenance
 - ◆ Replacing the Temperature Sensor (See page 154)

10.1 Walk-Around Inspection Tour



Walk-Around and inspect the Atlantium system once a month to check for water leaks, visible damage to the cables and harnesses, or any other part of the system. Report any problem you find to an authorized technician.

➔ To perform a Walk-Around inspections:

- Step 1.** Walk around the Atlantium unit and inspect it. Look for leakage at the incoming and outgoing pipes.
- Step 2.** Inspect the **Cable Harness** and cables running between the Unit and the Ballast Module(s) and the **Control Module** for signs of fraying and any other visible damage.
- Step 3.** Inspect the Ballast Module(s) and **Control Module** for any signs of damage.
- Step 4.** Report any leakage or damage to an authorized technician immediately.

10.2 Cleaning In Place (CIP)



The CIP procedure consists of two parts:

- Cleaning to remove the accumulated deposit (particles) that collect on the quartz sleeve over time
- Disinfectant cleaning to sterilize the quartz sleeve (not applicable to some Municipal installations)

Clean the Atlantium Unit's inner surfaces and quartz sleeve generally on a periodic basis that is determined by observing that the performance is on target and the UVT Sensor readings are stable. You can clean using this process less frequently, depending on the specific chemistry of your water.

A CIP recirculation system is available from Atlantium as an optional CIP Kit. Connect the recirculation system to the CIP ports to create a closed-loop flow line that pumps a diluted solution through the Unit.



- In facilities where CIP is performed on the plant level, circulating through all piping, the CIP process is the same for the Atlantium System. The inlet and outlet valves referred to in these sections are irrelevant.
- If the Atlantium Unit(s) is/are integrated into the facility's CIP loop, ensure that the water flow rate through the Unit is at least 60 m³ per hour.
- In facilities with plant-wide CIP, perform CIP with the Atlantium System running.
- In facilities that utilized sea water, sea water may be used in the CIP process provided that the chemical manufacturer of the cleaning/disinfectant solution approves.

The estimated time for a CIP process is 1.5 hours.

Prepare the following:

- Protective chemical-safe goggles, clothing and gloves
- An external pump-driven recirculation system with a built-in 100 liter reservoir (26.5 US gallons) or Atlantium's CIP Kit including its accessories (See **Sampling Valve Components and Kits** on page 30.)
- Scalant cleaning solution
- Disinfectant cleaning solution (if disinfection is planned)

10.2.1 Selecting the Correct Chemicals for CIP

It is **critically important** to select the correct cleaning and disinfecting chemical for the CIP process. It must be powerful enough to clean the inner surfaces of the Atlantium unit, while at the same time:

- Does not harm the components of the Unit that it comes into contact with (stainless steel 316/super-duplex stainless steel UNS S32750, quartz and Viton® O-rings).
- Does not contaminate the product for which the water being treated by the system is used.

WARNING!



- The cleaning/disinfectant solution selected and the concentrations used must be approved for use by the facility's quality assurance and safety officials, and must comply with the written protocols and procedures set in place by those departments.
- It is the responsibility of the owner/operator of the Atlantium system, as applicable, to ensure that the cleaning/disinfectant solution to be used in the CIP process shall be of a type that is permitted for this use in the country/jurisdiction where the CIP process is to be performed.
- Use and handle in strict accordance with their manufacturer's instructions, product information sheets, and material safety data sheets (SDS).
- Use of NaOH (Caustic Soda) may cause irreversible damage to the quartz. Use of this material requires an analysis of temperatures, concentration, frequency and duration and written approval from Atlantium's application engineer.



- All chemicals must be obtained locally.
- Atlantium does not supply chemicals - get them locally from commercial chemical suppliers.

Recommended Scalant Cleaning Solutions

The following chemicals have been tested and found to be very effective for cleaning and are recommended for use when cleaning the Atlantium system:

- Phosphoric acid (H_3PO_4) 2% diluted solution
- Nitric acid (HNO_3) 2% diluted solution
- HCl 2% diluted solution - recommended for metal based (rust-colored) deposits
- Sulfamic acid (H_3NSO_3) 1.5% diluted solution - recommended for calcium based deposits

Recommended Disinfectant Solutions (not applicable to some Municipal installations)

(The Disinfectant CIP process is not applicable to some Municipal installations)

The following have been tested and found to be very effective for disinfection and are recommended for use when disinfecting the Atlantium system:

- Peracetic acid-based chemicals - 30 min. contact time, for example:
 - P-3 Oxonia Active 150 - 0.5% diluted solution according to manufacturer's recommendation
 - Divosan Forte - 0.5% diluted solution according to manufacturer's recommendation
- Hot water at 85°C (185°F) for 30 min.



WARNING!



- It is the responsibility of the Atlantium system's owner/operator to use and apply the correct chemicals.
- The use of any other cleaning and disinfection chemicals requires Atlantium's approval.

10.2.2 Preparing the Chemical Solution

For both cleaning and disinfecting, the liquid in the reservoir must contain the desired percentage of the chemical additive (see above). Therefore, the purchased chemical solution must be diluted and added to the reservoir. Calculate the correct amount of chemical solution to be used for the CIP process.



Protect yourself from the ill-effects of chemicals with protective chemical-safe goggles, clothing and gloves.



- The concentrations refer to room temperature.
- The diluted solution values denote the required dilution of the chemical circulating through the Atlantium Unit.
- While calculating the diluted volumes, consider all volumes including the Unit, pipes and the recirculation reservoir.

➔ To calculate the correct amount of chemical solution:

Step 1. Calculate the total volume you need for the CIP* by adding the water volumes in:

- The Atlantium Unit volume (measurements in liters/gallons) - Refer to the **Physical Specifications** Table in **Atlantium System Footprint** on page 12
- The pipes between the Atlantium Unit and the **Inlet** and **Outlet Valves**
- The CIP recirculation system
- The hoses between the Unit and the recirculation system

Step 2. Calculate the amount of chemical additive to be added to the reservoir to achieve the desired dilution. Use this formula:

$$C = \frac{A * V_t}{B}$$

A - The target concentration for the liquid (chemical substance + water) in %

B - The concentration of the chemical substance to be added in %

C - Volume of the chemical substance to be added in liters/gallons

V_t - Volume of the water in the Unit + piping + CIP Reservoir (as described above*) in liters/gallons

OR:

Assume that you need a 2% diluted solution in the CIP process and assume that your purchased solution is of a 35% concentration in a 4-liter container.

Calculate according to this calculation: [200 liter X 2%] / [35% X 4 liter] = [400] / [140] = 2.9 = 3 containers.

CAUTION!



* If you intend to collect the solution into the CIP reservoir or other container, the total volume of the cleaning solution must not exceed the volume of the CIP reservoir or container.

Be sure to obtain from an engineer the correct calculation for the amount of chemicals to be used for the process you intend to use.

10.2.3 Performing CIP

CAUTION!



The anti-scaling procedure is performed only if necessary. Atlantium recommends that anti-scaling always be followed by disinfection.

The CIP process is performed utilizing fresh water. For systems with sea water, drain the system and rinse before performing CIP.



- In facilities where CIP is performed on the plant level, circulating through all piping, the CIP process is the same for the Atlantium System. The inlet and outlet valves referred to in these sections are irrelevant.
- If the Atlantium Unit(s) is/are integrated into the facility's CIP loop, ensure that the water flow rate through the Unit is at least 60 m³ per hour.
- In facilities with plant-wide CIP, perform CIP with the Atlantium System running.

This section details the CIP process with recommended steps for carrying it out. The procedure is to be adapted according to the specific circumstances of your installation.

The CIP process is to follow these major steps:

(Refer to the next section for the detailed description on the CIP process.)

- Step 1.** Close the inlet and outlet valves and immediately shut down the Atlantium system
- Step 2.** For systems with sea water, if needed, drain the system
- Step 3.** Remove the caps covering the CIP ports
- Step 4.** Connect the supply hose to the bottom CIP port and connect the return hose to the top CIP port
- Step 5.** Fill the CIP reservoir with fresh water or sea water
- Step 6.** Starting the circulation
- Step 7.** Adding the cleaning solution (See *Selecting the Correct Chemicals for CIP* on page 116.)
- Step 8.** Running the CIP circulation for at least 30 minutes or as specified according to the chemical manufacturer
- Step 9.** Rinsing the system and the CIP cart
- Step 10.** Performing CIP Disinfection with the disinfection solution
- Step 11.** Ending CIP

The CIP diagram below is followed by the full recommended CIP procedure.

CIP Setup

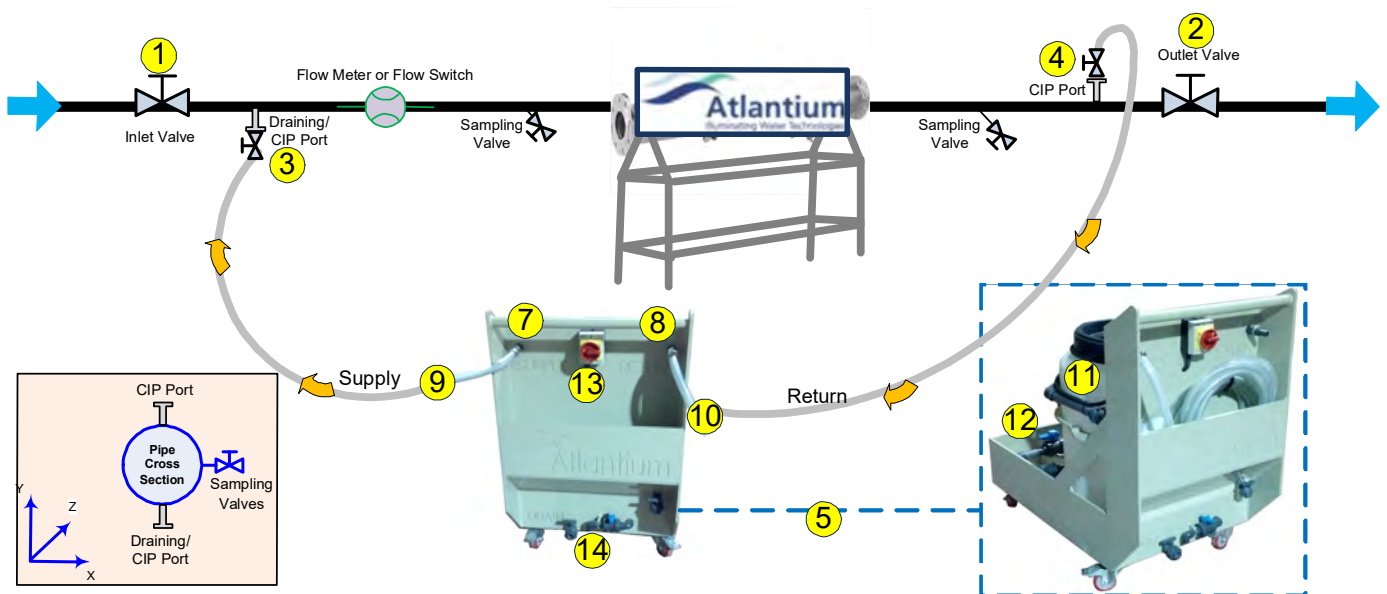


Figure 10-1: Recommended CIP Setup



If the installation is vertical, the water flow is from bottom to top. The Draining/CIP port (3) is on the bottom, under the Atlantium Unit and the CIP port (4) is above the Atlantium Unit.

➔ To Perform CIP:

ATTENTION!

If you are only performing disinfection: Follow Steps 1 through 20. Then resume with Step 22.

If you are performing both procedures: Follow all of the steps below.

Shutting Down the System

- Step 1.** Close the Unit's inlet isolating valve (1) and outlet isolating valve (2). Immediately proceed to the next step.
- Step 2.** Shut down the Atlantium system, on the **Control Module**, by pressing the **Main Unit Operation Button Operation** button in the upper-right corner.
- Step 3.** On each CIP port, remove the cap's clamp and remove the caps covering the CIP ports (3 & 4). Place the caps in a safe place for reuse later. Verify that the gasket is still inserted into the ferrule.

ATTENTION!

Make sure that the hose fittings are secure and tight.

Water must fill the entire path through the piping on both sides of the Atlantium Unit and the Unit itself, as well as the Supply and Return hoses and the CIP Kit's reservoir.

Connecting the CIP Hoses

- Step 4.** Remove the hoses from their pocket on the Cart.
- Step 5.** Using the CIP cap's clamp, connect the CIP Kit's Supply hose to the bottom CIP port **(3)**. Verify that the gasket is present.
- Step 6.** Using the CIP cap's clamp, connect the CIP Kit's Return hose **(10)** to the top CIP port **(4)**. Verify that the gasket is present.

Filling the CIP Reservoir

Step 7. To fill the CIP reservoir **(A)** with water:

■ **Filling option 1:**

- Slightly open the Unit's inlet isolating valve **(1)** and open the top CIP port on the outlet side **(4)** and allow the facility's water to fill the CIP Kit's reservoir **(11)**.
- There is a full line indicator on the reservoir **(11)**. Make sure the water in the reservoir is up to the 100 liter (26.5 US gallons) level.
 - ◆ Close the Unit's inlet isolating valve **(1)**.
 - ◆ Close the CIP port **(4)** valve.

■ **Filling option 2:**

- Open the top cover of the CIP Kit's reservoir **(11)**.
- Using a hose of an external water source, fill the reservoir with 100 liter (26.5 US gallons) of room-temperature tap water ($\pm 25^{\circ}\text{C}/75^{\circ}\text{F}$).
- There is a full line indicator of the reservoir. Make sure the water in the CIP Kit's reservoir **(11)** is filled to the 100 liter (26.5 US gallons) level.
- Close the cover.

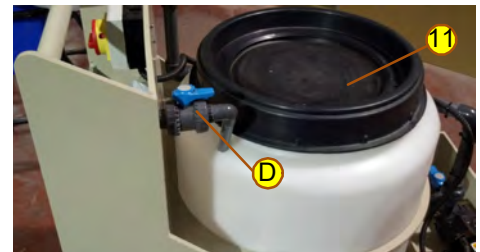


Figure 10-2: CIP Kit's Reservoir



Figure 10-3: CIP Cart's Inlet and Drain Port



WARNING!

Observe chemical safety rules! Follow all safety recommendations in the chemical manufacturer's product information and SDS publications!

Adding the Chemical Solution



Protect yourself from the ill-effects of chemicals with protective chemical-safe goggles, clothing and gloves.

- Step 8.** Open the top cover of the CIP Kit's reservoir **(11)** and add the prepared chemical solution to the water in the reservoir. (See *Selecting the Correct Chemicals for CIP* on page **116.**.)

Starting the CIP Circulation Process

ATTENTION!

The Atlantium Unit must be absolutely full for the solution to reach all of the inner surfaces.

- Step 9.** If the bottom and top CIP ports **(3 & 4)** are valves, open them.
- Step 10.** To start the CIP recirculation pump, on the CIP cart, turn the switch **(13)** to the **On** position and allow the solution to circulate through the Unit for **the period of time specified in the chemical's Use instructions, but not less than 30 minutes.**
- Step 11.** Verify that the Atlantium Unit is full of water and that the water is circulating correctly.
- Step 12.** During the circulation period open and close the sampling valve several times to assure chemical contact with the CIP chemicals.

If the draining valve is separate from the CIP ports, open and close the draining valve.

Rinsing the System and CIP Kit

After the chemical solution has circulated through the Unit for a sufficient duration, the chemicals solution must be rinsed from the system.

- Step 13.** Open the top cover of the CIP Kit's reservoir **(11)** and add the prepared chemical solution to the water in the reservoir. (See *Selecting the Correct Chemicals for CIP* on page **116.**.)
- Step 14.** Connect the CIP recirculation system's drain valve **(B)** to the facility's sewage system. See *Alternatives for Draining the Cleaning Solution* on page **124.**
- Step 15.** Turn on the Atlantium system, on the **Control Module**, by pressing the **Main ON/OFF Operation** button in the upper-right corner

ATTENTION!

Before performing the next step, verify that the lamp(s) are on and the system has stabilized and indicates it is ready. If not, restart the lamp(s) again and wait until the system has stabilized and indicates it is ready.

- Step 16.** Close the inlet CIP port **(3)**, stop the recirculation pump **(12)** and open the CIP recirculation system's drain valve **(C)**. Immediately slightly open the inlet valve **(1)** to rinse the Atlantium system thoroughly.

Allow this rinsing process to operate until at least three cycles of water volume have gone through the Atlantium Unit to remove all of the scalant cleaning/disinfectant solution.

- Step 17.** To assure that all the chemicals are flushed out, use a measurable indicator, such as measuring the pH, or other indicators depending on the chemical being used (consult your chemical supplier).
- Step 18.** Slightly open the outlet valve **(2)** and close the CIP port on the outlet side **(4)**. To avoid hammer effect if there is air trapped in the system, carefully open the inlet valve **(1)** completely. Resume normal operation.

Rinsing the CIP Reservoir

After the chemical solution has circulated through the Unit for a sufficient duration as specified by the chemical supplier (typically 30 minutes), the chemicals solution must be rinsed from the system by the steps below.

- Step 19.** Open the CIP cart's drain valve **(C)** and completely drain the CIP reservoir **(11)**.
- Step 20.** Using an external water source, rinse the CIP cart's reservoir, letting the rinse water drain out of the CIP cart's drain valve **(C)**.
- Step 21.** Close the CIP cart's drain valve **(C)**.

Performing CIP Disinfection

- Step 22.** If you are planning to perform an additional CIP process using the disinfectant solution, refer to **Preparing the Chemical Solution** on page **118** and follow the CIP process again from **Filling the CIP Reservoir** in **Step 7.** above.

Or,

To return to normal operating status, proceed to the next step.

Ending CIP

- Step 23.** To drain out any water inadvertently collected in the CIP cart's storage pocket or base, use the CIP cart's drain valves **(A)** and **(B)**.
- Step 24.** Roll up the CIP Kit's hoses and return them to their storage pocket **(F)**.

Refilling the System

ATTENTION!

Make sure that the Atlantium Unit is filled with water before powering it up and turning on the lamps.

- Step 25.** Turn on the Atlantium system at 100% power and wait until the system has stabilized and indicates that it is ready.

Returning Power to the Lamps

- Step 26.** On the Connection Box next to each lamp, turn the switch to the **On** position.
- Step 27.** Turn on the Atlantium system, on the **Control Module**, by pressing the **Main ON/OFF Operation** button in the upper-right corner.

Alternatives for Draining the Cleaning Solution

- **If local regulations permit, and a physical drain setup exists,** drain the used cleaning solution to the facility's sewage system:
 - a Connect the CIP recirculation system's drain valve **(B)** to the facility's sewage system.
 - b With the Atlantium System operating, slightly open the Inlet valve.
 - c Close the inlet bottom CIP port **(3)**.
 - d To stop the CIP recirculation, on the CIP cart, turn the switch **(13)** to the **Off** position.
 - e Open the CIP cart's drain valve **(C)**. The water with the chemical solution begins to drain out.
 - f Connect the CIP cart's drain valve **(C)** to the facility's sewage system.

Or,

- **According to local regulations, use the Draining/CIP port to drain the solution in the system into a external container.**

Or,

- **Use the CIP reservoir (11) to collect the chemical solution.**
 - a Connect the CIP recirculation system's drain valve **(B)** to the facility's sewage system.
 - b With the Atlantium System operating, close the inlet bottom CIP port **(3)**.
 - c To stop the CIP recirculation pump, on the CIP cart, turn the switch **(13)** to the **Off** position.
 - d Allow the chemical solution to drain entirely into the CIP reservoir **(11)**.
 - e Dispose of the contents according to regulations. Connect a drainpipe to the CIP cart's drain pipe and open the CIP cart's drain valve **(C)**. The water with the chemical solution begins to drain out.
 - f Disconnect and close the CIP cart's drain valve **(B)**.

10.3 Stopping/Starting the Ultrasonic Cleaner (if installed)

For systems with the Ultrasonic Cleaning System, for whatever reason, you may want to manually stop or start the Ultrasonic Cleaner's operation per lamp.

➔ To stop/start the Ultrasonic Cleaner from the Control Module:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Step 2.** Tap the **Cleaner tab**. The **Cleaner** screen appears.

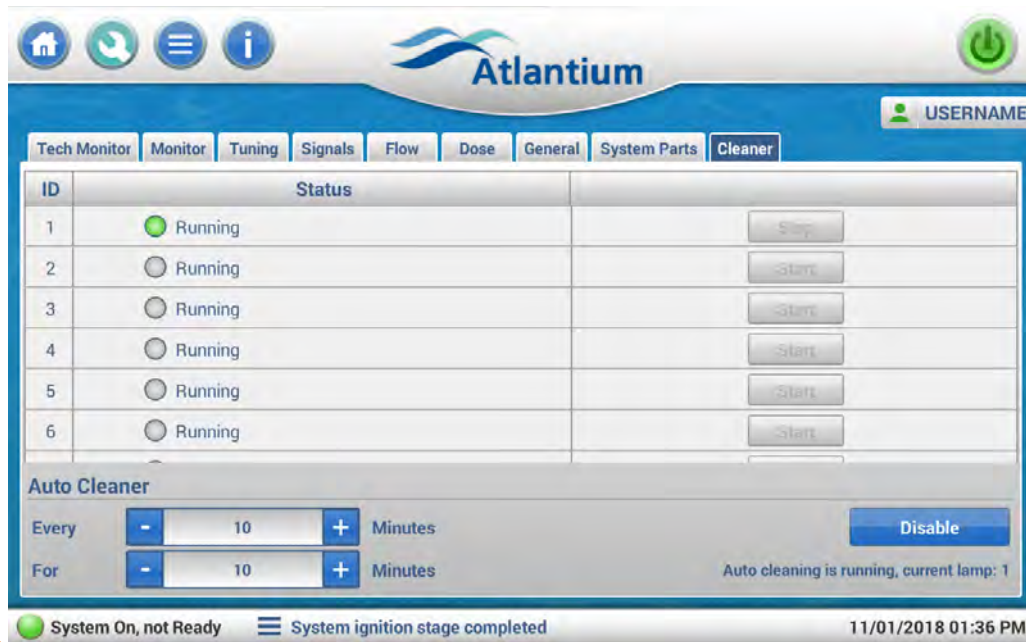


Figure 10-4: Cleaner Screen

- Step 3.** To start cleaning on a particular lamp, for the desired lamp, tap **Start**.
- Step 4.** To stop cleaning on a particular lamp, for the desired lamp, tap **Stop**.
- Step 5.** To disable the cleaner on the entire system, in the lower right corner, tap **Disable**.

To reinstate the cleaner operation, tap **Enable**.

10.4 Resetting the Cleaner Counter



You can reset the counter that keeps track of the number of time the cleaner has performed a cleaning.

➔ To resent the counter:

- Step 1.** From the **Main Operations** screen, tap . The **Password** screen appears.
- Step 2.** Using the numbered keys, enter the password (default password is **1357**) and tap **OK**. The Settings screen appears.
- Step 3.** For **Cleaner**, tap . The Cleaner Setting screen appears.
- Step 4.** For Lamp, using the arrows, select the number of the lamp for which you want to reset the counter.
- Step 5.** Tap **Rst**. A number pad appears displaying **0**. Tap . The counter is reset to **0**.

10.5 Checking & Cleaning the BM Cooling Fans



Once a month, perform the following maintenance procedure on Ballast Modules Type B/C:

➞ To check and clean the cooling fans:

Step 1. Check with your hand that the fans are blowing air out of each Ballast Module (BM types B and C, see figure below)



Electric Shock:

The system must be switched off before performing the following cleaning procedure

- Step 2.** For BM Type B, unscrew the 4 Phillips screws at the top of the fan cover and remove the fan cover - see Figure 10-5 on page 127.
- Step 3.** Using air pressure, clean the inlets on the underside of BM Type B (see airflow arrows) and the outlet vents of the fan on the top of the unit. The BM can be removed from the wall for cleaning but it is not necessary to disassemble it further.
- Step 4.** If dirt accumulates in the fan environment or in its suction openings of BM Type B, wipe clean with a damp cloth.
- Step 5.** Replace fan cover of BM Type B and screw it in place with the 4 Phillips screws, then remount unit on wall, as necessary.
- Step 6.** For BM Type C, dismount unit from wall and locate the fan on the inner side of unit (see figure).
- Step 7.** Using air pressure, clean the fan and the cooling ribs of BM Type C and wipe clean with damp cloth as necessary.
- Step 8.** Remount BM Type C on wall.

The interval time between performance of cleaning steps 2-8 can be increased following your actual experience with the rate of accumulated dirt on the fan and vents. Once that interval is changed, mark it in your maintenance procedure or in this book

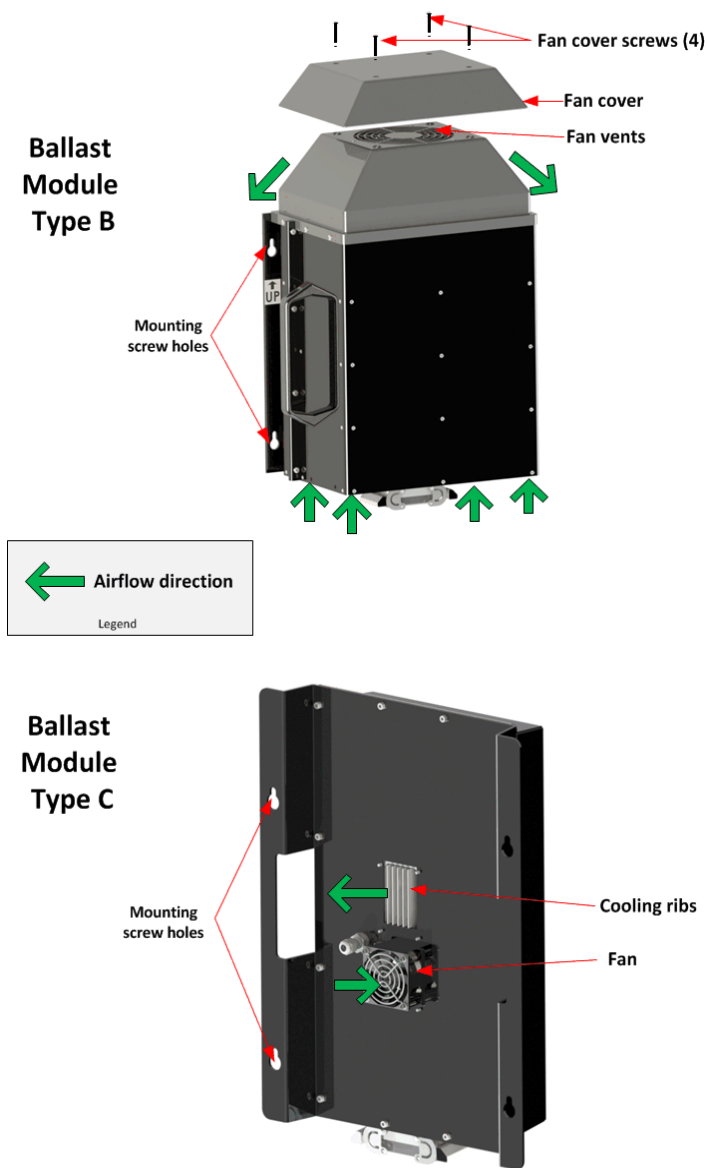


Figure 10-5: Dismounting Ballast Module (Type B or C) for cleaning

10.6 Checking the Cooling Fans



Once a month the cooling fans of the Ballasts must be checked to verify that the air is flowing out.

➔ To check the cooling fans:

- Check that air is being blown out of the fans of the Ballasts in the See page 128

10.7 Checking the Temperature Sensors' Readings

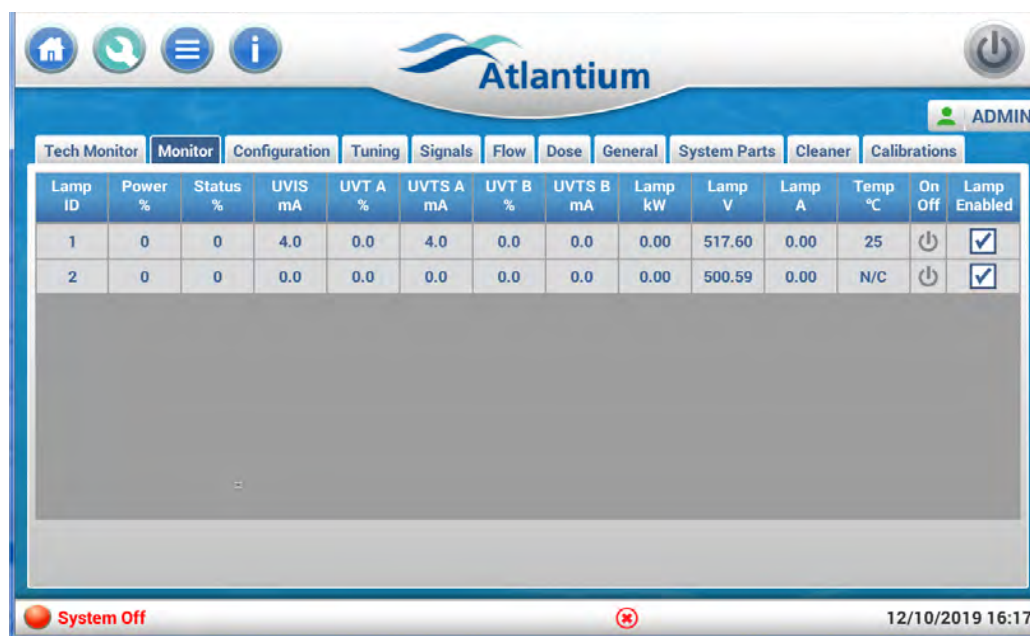


Once a month both temperature sensors must be checked to verify that they are working properly.

➔ To check the temperature sensors' readings:

Step 1. At the top of the screen, tap . The **System Info** screen appears.

Step 2. Tap the **Monitor** tab. The Monitor screen is displayed.



Lamp ID	Power %	Status %	UVIS mA	UVT A %	UVTS A mA	UVT B %	UVTS B mA	Lamp kW	Lamp V	Lamp A	Temp °C	On Off	Lamp Enabled
1	0	0	4.0	0.0	4.0	0.0	0.0	0.00	517.60	0.00	25		<input checked="" type="checkbox"/>
2	0	0	0.0	0.0	0.0	0.0	0.0	0.00	500.59	0.00	N/C		<input checked="" type="checkbox"/>

System Off 12/10/2019 16:17

Figure 10-6: Monitor Screen

Step 3. In the temperature column, check the value for **Temp**.


Step 4. Verify that the temperature readings are within acceptable temperature range.

10.8 General Lamps, Sleeves Maintenance Tips

The following are some tips that are meant to help you understand maintenance requirements:

- Lamps and quartz sleeves traverse the width of the Unit and are held in place by holders and connectors at both sides. For maintenance, you can access the lamps and quartz sleeves from either side. Depending on the constraints of the installation (sometimes one side is less accessible) you can usually decide from which side to access the them.
- To access the quartz sleeve, you must remove the lamp housed within it.
- On rare occasions, quartz sleeves and their O-rings may need to be replaced because of a maintenance issue that arises.

10.9 Replacing a UV Lamp



Performed
as needed

The UV lamp can be used as long as it provides the required dose and efficient service. (Generally, a lamp service status of 80% or more is considered efficient service.) A lamp should be replaced **ONLY** when necessary.

Each lamp's performance is measured directly by a dedicated UV Intensity Sensor. Replace a lamp when:

- Its status or performance declines and the lamp no longer provides the required performance at the appropriate electrical cost
- Once its rated hours expire, be alert to any changes in efficiency that could indicate the need to change the lamp

In the **Control Module**, you can set a margin to assure notification as status declines and a warning is sent to the operator at both the user setting level and the internally coded minimum.



For systems with multiple lamps, the system may continue to operate while any one of the lamps is being replaced, however, precautions must be carried out to protect you from the UV.

Before commencing this procedure:



CAUTION!



- Allow the old lamp at least 10 minutes to cool down before starting.
- Read carefully the instructions provided in the new Lamp package.
- Wear white cotton gloves.
- Before installing a new lamp, verify that it is clean and free of grease. If not, rub it gently with the provided lens tissue. Never touch the lamp with your bare hands - hold it only by the end-connectors. Oily residues from fingerprints can damage the lamp.



WARNING!



- The UV lamps are designed with high internal positive pressure. Wear protective eye-wear while replacing a lamp. Pay strict attention to the safety warnings and precautions in the **Safety Overview** on page 35 in the front of this manual.
- In case of lamp breakage, refer to the Safety instructions in **Safety Overview** on page 35.

When replacing a lamp while the rest of the system is still in operation, you must follow these safety requirements:



- Shutdown the electricity supplied to the lamp to be replaced.
- During the time when the lamp's breather caps are removed, use Caution floor signs at a distance of 1m/ 40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Wear appropriate eye protection.
- Do not look directly into the lamp enclosure or into any openings that emit UV light during the entire lamp replacement procedure.



CAUTION!

While carrying the steps of this procedure, replace all of the O-rings on the components, such as the lamp housings and holders.

Prepare the following Information for the replacement lamp:

- lamp's serial number
- system model
- the number of hours on the lamp usage clock when you changed the lamp
- the number of ignitions of the lamp
- the status of the lamp when you changed it

10.9.1 Lamp Replacement Options

- Replacing a Lamp after System Shutdown (10.9.2)
- Replacing a Lamp while System is Operating (10.9.3)

Generally, a lamp is replaced after shutting down the entire Atlantium system. However, in a facility where there is no redundant UV purification, and you require minimizing system downtime, you can replace a lamp while other lamps continue operation provided you follow these safety requirements:

Replacing a Lamp after System Shutdown


Prepare the following:

- Replacement lamp
- Lamp cleaning cloth (comes with the lamp)
- White cotton gloves
- Eye protection
- #3 Allen wrench
- #4 Allen wrench
- Caution signs

10.9.2 Shutting Down the Entire System

Generally, a lamp is replaced after shutting down the entire Atlantium system.

➡ To shut down the entire system:

- Step 1.** Using the viewport on the Atlantium Unit, check that the lamps are indeed turned off.
- Step 2.** Check the main screen of the **Control Module** and verify that the system parameter for **Power** is **0%**.
- Step 3.** On the top-right of the screen, tap . The button turns grey. Wait approximately three minutes for the **Lamps Off** signal to transmit.



A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp's switch before you proceed to replace the lamp.

- Step 4.** Open the **Control Module** using the attached key and locate the circuit breaker. Turn the circuit breaker to the **OFF** position.
- Step 5.** Continue with the procedure, *Replacing the Lamp* on page 132.


10.9.3 Replacing a Single Lamp/ while System is Operating

If you are replacing a lamp while other lamps are still in operations, follow these safety requirements:



- Shutdown the electricity supplied to the lamp to be replaced.
- **During the time when the lamp's breather caps are removed, use Caution floor signs at a distance of 1m/ 40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.**
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Where appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards. The UV lamps are designed with high internal positive pressure.
- **Do not look directly into the lamp enclosure or into any openings that emit UV light during the entire lamp replacement procedure.**

➡ To shut down electricity to a single lamp:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.



Lamp ID	Power %	Status %	UVT %	UVIS mA	UVTS mA	Lamp kW	Lamp V	Lamp A	Temp °F	On Off	Lamp Enabled
1	100	100	97.0	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
2	100	99	97.1	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
3	100	99	0.0	17.8	0.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
4	100	99	97.1	17.8	18.0	1.70	220.00	7.72	77		<input checked="" type="checkbox"/>
5	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
6	100	100	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
7	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>
8	100	99	0.0	17.8	0.0	1.70	220.00	7.72	N/C		<input checked="" type="checkbox"/>

System On, Ready 10/07/2018 01:25 PM

Monitor tab

Step 2. Under **Lamp Enabled**, for each lamp you want to disable, tap the checkbox to clear it. The corresponding lamp is disabled.



A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp before you proceed to replace the lamp.

Step 3. Continue with the procedure, *Replacing the Lamp*, below.

10.9.4 Replacing the Lamp

The **System Parts** tab of the AIO control application enables convenient recording of the replacement of lamps and other consumables.

➤ Recording lamp replacement

- Step 1.** Log in as an ADMIN user and tap on **System Parts** tab to open it (see Figure 10-7)
- Step 2.** In the **Select System Part** column, tap on **Lamps** and the **Lamps - Replace** column opens
- Step 3.** Select the correct **UV unit ID** (=1 if there is just one UV unit in system)
- Step 4.** Choose (LM, Connection) **card** number
- Step 5.** Enter the **Serial number** of the new lamp and the **replacement reason**.
- Step 6.** In the **Age** field, set the age of the new lamp (0 hours for a brand new lamp).
- Step 7.** Tap **Done** to save changes.

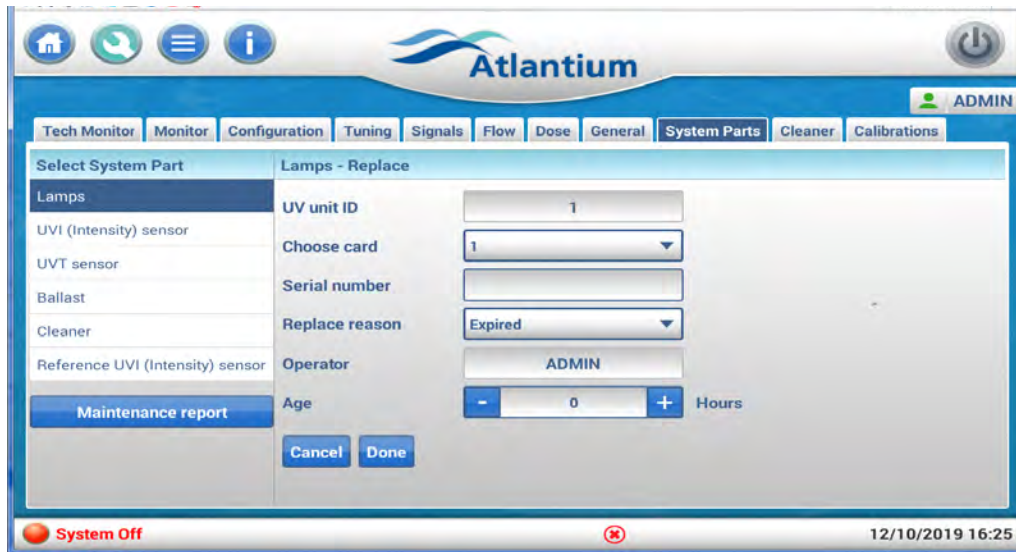


Figure 10-7: System Parts tab with Lamps selected

Step 8. To view Maintenance report, tap **Maintenance report** button (see **Viewing Maintenance Report** *To view a report:* on page 156)

Once the electricity is turned off for the system or for the specific pair of lamps (at least one of which is to be replaced) and preparations are made (see above) you can replace the lamp.

➡ Before replacing a lamp:

Step 1. On the corresponding Connection Box associated with the lamp to be replaced, turn the switch to the **OFF** position.

Step 2. If you are replacing a lamp while other lamps are still in operation, follow these safety requirements:



- During the time when the lamp's breather caps are removed, use Caution floor signs at a distance of 1m/ 40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Wear white cotton gloves.
- Wear long sleeves rolled down to your wrist.
- Where appropriate eye protection, such as containing polycarbonate lens that meet EN166, CAN/CSA-Z94.3-02 and/or Z87.1 standards.
- **DO NOT** look directly into the lamp enclosure during the entire lamp replacement procedure.

➡ To remove lamp connector assembly

- Step 3.** Using a #3 Allen wrench, remove the four Allen screws (1) that secure the lamp's connector assembly (2) and remove the connector assembly. Each screw has a washer.
- Step 4.** **To prevent any damage to the lamp,** make sure you pull the lamp's connector assembly straight out and not at an angle.
- Step 5.** Using a #4 Allen wrench, remove the 4 screws (3) of the lamp's housing (4). Each screw has a washer.
- Step 6.** Grasp the lamp's housing and rotate it clockwise and counterclockwise until it loosens. **Make sure the housing is not tilted against the quartz sleeve while rotating it.**

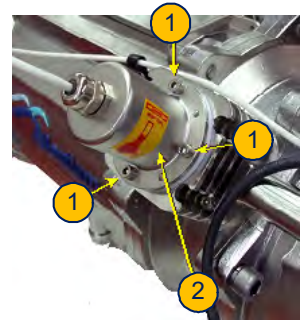


Figure 10-8: Lamp Replacement (Generic View 1)

(The O-Ring on the sleeve stopper between the holder and the stopper may cause the two parts to stick due to the heat. The slight rotation releases it).

- Step 7.** **To prevent any damage to the lamp and quartz sleeve,** make sure you pull the lamp's housing straight out and not at an angle.

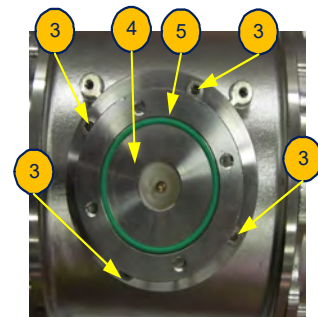


Figure 10-9: Lamp Replacement (Generic View 2)

10.9.5 Removing the Faulty Lamp



The lamp is hot! DO NOT touch the lamp with bare hands, particularly the quartz portion.

Wait at least ten minutes until the lamp has cooled down or use an appropriate pair of long-nose pliers to carefully pull out the lamp.

- Step 1.** Wearing appropriate cotton gloves and skin covering, and using a suitable long-nose pliers, pull the lamp straight out of the quartz sleeve in the Unit and set it aside on a stable surface.
- Step 2.** Check the inner surface of the quartz sleeve for residual moisture or high humidity. If any visible moisture exists, using a lens cleaning cloth, dry it.

For Systems with Wave Guide

Every time the lamp is replaced, the wave guide must be cleaned or, if needed, replaced. See **Cleaning/Replacing the UV Intensity Wave Guide** on page 138.

Cleaning/Replacing the UV Intensity Wave Guide or Mirror

- Step 3.** If you need to clean or replace the **UV Intensity Wave Guide** or **Mirror**, do so now before installing the new lamp.
- For wave guide, refer to **Cleaning/Replacing the UV Intensity Wave Guide** (on page 138)
 - For mirror, See page 138

Installing the Replacement Lamp

- Step 4.** Unpack the new UV lamp from its vacuumed sealed package.
- Step 5.** Make a note of the serial number of the new lamp.

- Step 6.** Clean the new lamp using the cleaning pad provided with the lamp. Verify that no visible fingerprint or dust is on the lamp.

- Step 7.** Insert the new lamp into the quartz sleeve in the Unit, all the way until it stops. Ensure that the male contact point (6) on the end of the lamp has meshed with the female contact point in the lamp's housing on the other side of the Unit.

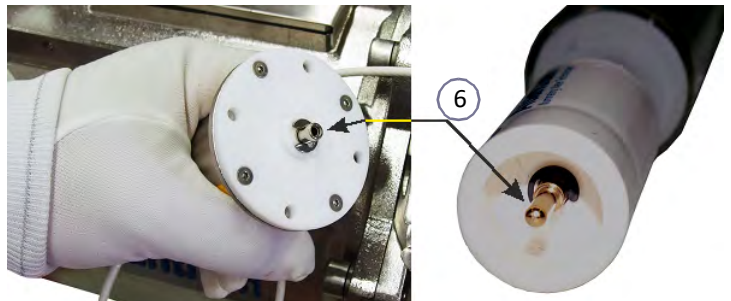


Figure 10-10: Lamp Replacement (Generic View 3)

Assembly

- Step 8.** Replace the lamp housing's O-ring.
- Step 9.** Insert the lamp's housing that you removed in above. Ensure that the male contact point on the end of the lamp has meshed with the female contact point in the lamp's housing on the other side of the Unit.
- Step 10.** Replace the lamp's housing and, using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.
- Step 11.** Replace the lamp's connector assembly pushing it straight in and using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.

Allowing the Atlantium Unit to Run with Caps Open

- Step 12.** Place Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Step 13.** Unscrew and remove the two caps (7) one on each side of the lamp. (See the figure to the right.)

Reactivating the Lamp

The newly replaced lamp must be tested to verify that it is in working order.

- Step 14.** For the lamp that was to be replaced, on the connection box, turn the lamp switch to the **On** position.

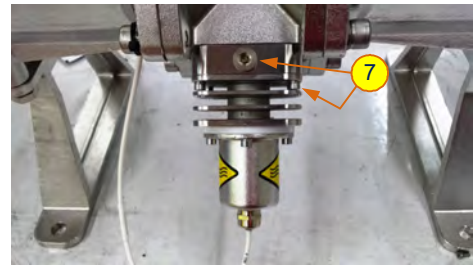


Figure 10-11: Lamp's Caps (Generic View 4)

If the Entire System is Off



ATTENTION!

While carrying the steps of this procedure, check that the O-rings on the components, such as the lamp housings and holders, are not damaged. If damaged, replace them before refastening the component in place.

Accessing the Lamp



ATTENTION!

For systems that contain wave guides, **be sure to access the lamp from the side that contains the sensors.** The wave guide is fragile and may be damaged easily if the lamp is inserted from the opposite site.

If only one lamp is off - Reactivation the Lamp

- Step 15.** Operate the system without the lamp's caps for one hour.
- Step 16.** Return the lamp's caps and remove the Caution floor signs.
- Step 17.** Perform system tuning according the instructions on page 149.

➔ Removing the Faulty Lamp



The lamp is hot! DO NOT touch the lamp with bare hands, particularly the quartz portion.

Wait at least ten minutes until the lamp has cooled down or use an appropriate pair of long-nose pliers to carefully pull out the lamp.

- Step 18.** Wearing appropriate cotton gloves and skin covering, and using a suitable long-nose pliers, pull the lamp straight out of the quartz sleeve in the Unit and set it aside on a stable surface.
- Step 19.** Check the inner surface of the quartz sleeve for residual moisture or high humidity. If any visible moisture exists, using a lens cleaning cloth, dry it.

Installing the Replacement Lamp

- Step 20.** Unpack the new UV lamp from its vacuumed sealed package.
- Step 21.** Make a note of the serial number of the new lamp.



Figure 10-12: Removing the lamp

- Step 22.** Clean the new lamp using the cleaning pad provided with the lamp. Verify that no visible fingerprint or dust is on the lamp.
- Step 23.** Insert the new lamp (**F**) into the quartz sleeve, all the way until it stops. Ensure that the male contact point (**G**) on the end of the lamp has meshed with the female contact point (**G**) in the lamp's housing on the other side of the Unit.
- Step 24.** Check that the lamp housing's O-ring is in place, clean, dry and undamaged. Replace if necessary.

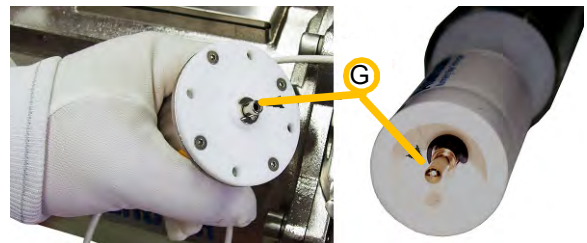


Figure 10-13: Lamp, Connector Assembly and connectors

- Step 25.** Reinstall the lamp's housing and, using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.
- Step 26.** Reinstall the lamp's connector assembly pushing it straight in. Ensure that the male contact point (**G**) on the end of the lamp has meshed with the female contact point (**G**) in the lamp's housing on the other side of the Unit. Using the # 3 Allen wrench, fasten the four Allen screws with their washers to secure it to the Unit.

Allowing the Atlantium Unit to Run with breather caps Open

- Step 27.** Temporarily place Caution floor signs at a distance of 1m/40inch from the Atlantium Unit that warn passersby against possible UV light exposure and not to approach without proper eye and skin protection.
- Step 28.** On the side without the DPM (if present), unscrew and remove the two breather caps (H) on each side of the lamp. (See the figure to the right.)
- Step 29.** Operate the system without the lamp's breather caps for one hour.
- Step 30.** Return the lamp's breather caps and remove the Caution floor signs.

Perform system tuning according the instructions on page 149

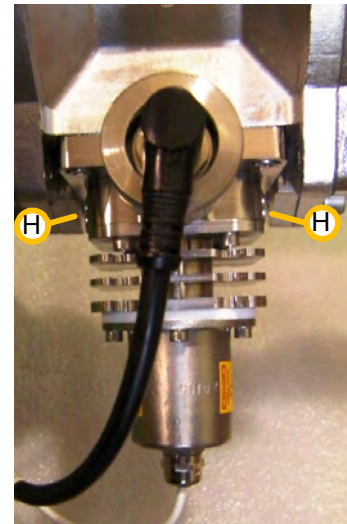


Figure 10-14: Lamp's breather caps (Generic View)

Reactivation the Lamp

- Step 31.** For the lamp that is replaced, on the connection box, turn the lamp switch to the **On** position. Check that the lamp ignites properly. See Figure 10.9
- Step 32.** Operate the system without the lamp's breather caps for one hour.
- Step 33.** Return the lamp's breather caps (G).

System Tuning

- Step 34.** Perform system tuning according the instructions on page 151.

Observing Lamp Efficiency

- Step 35.** Observe the system's efficiency for **100 hours**. If after this period there is a performance degradation of more than 5%, remove the UV intensity sensor and check for humidity. Clean if necessary. For the adjustable UVIS sensor, see the instructions on page 146.
- Step 36.** Perform **System Tuning** according the instructions on page 151.

10.10 Cleaning/Replacing the UV Intensity Wave Guide



If your system includes wave guides:

For each UVIS sensor in the Atlantium Unit, there is an internal wave guide for directing UV light into the sensor. The UV Intensity Sensor's wave guide must be cleaned every time the lamps are replaced.

Prepare the following:

- Replacement UV Intensity Sensor's Wave Guide PN SAM000800
- Wave Guide tool PN SA0066000
- White cotton gloves
- Alcohol/isopropanol and lint-free lens cleaning paper
- Appropriate Phillips screwdrivers



- Allow the old lamp at least 10 minutes to cool down before starting.



- Be very careful when handling the wave guide. The wave guide is made of quartz and is fragile and easily broken.

➔ To clean/replace the wave guide:

Accessing the Wave Guide to be Replaced

- Step 1.** On the side of the Unit where the UVIS sensors are located, identify the lamp whose wave guide is to be cleaned/replaced.
- Step 2.** Follow the directions for removing a lamp. See *Replacing a UV Lamp* on page 129.

Removing the Wave Guide

- Step 3.** Screw the Wave Guide tool (**L**) onto the wave guide socket (**J**).

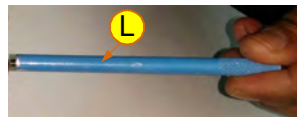


Figure 10-15: Wave Guide Tool

- Step 4.** While holding the Wave Guide tool (**L**) now attached to the wave guide (**G**), using an appropriate Phillips screwdriver, (**M**) unfasten each of the screws (**K**).

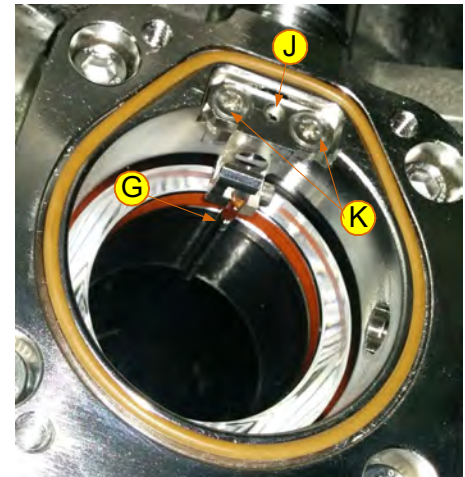


Figure 10-16: Wave Guide Elements (Generic View)

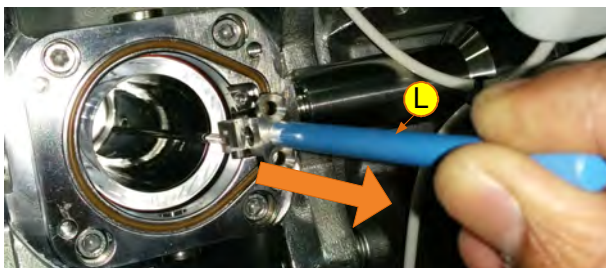


Figure 10-17: Removing the Wave Guide (Generic View)

- Step 5.** With the Wave Guide tool (**L**), carefully pull out the wave guide.
- Step 6.** Unscrew the Wave Guide tool (**L**) and detach it from the wave guide (**G**).

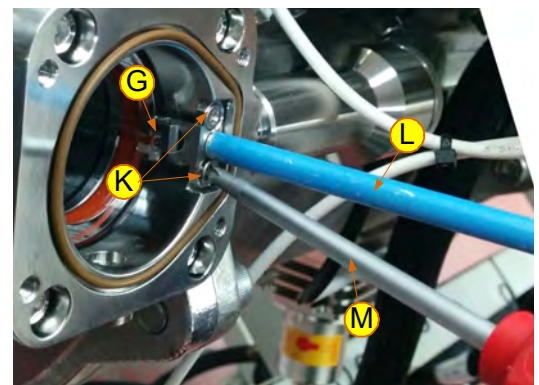


Figure 10-18: Unfastening the Wave Guide (Generic View)

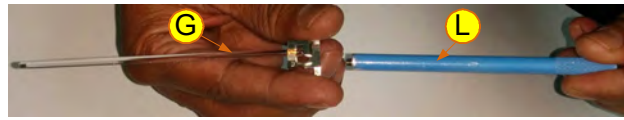


Figure 10-19: Wave Guide Tool and Wave Guide

Cleaning the Wave Guide

- Step 7.** While wearing white cotton gloves, carefully clean the wave guide with isopropanol and lint-free lens cleaning paper.
- Step 8.** Ensure that the wave guide is completely dry before returning it to its place.
- Step 9.** Examine the wave guide for marks and damage. Fingerprints or other stains may cause erroneous UV intensity sensor readings. If the wave guide's surface is damaged, it must be replaced.

Preparing the Replacement Wave Guide

- Step 10.** Screw the Wave Guide tool (L) onto the wave guide socket (J).
- Step 11.** With the Wave Guide tool (L), carefully insert the wave guide in place.
- Step 12.** While holding the Wave Guide tool (L) now attached to the wave guide (G), using an appropriate Phillips screwdriver, (M) fasten each of the screws (K).
- Step 13.** Check that the wave guide is parallel to the side of the quartz sleeve and not pointing at an angle. If it is at an angle, the quartz sleeve is not installed straight. Remove the wave guide and remove and reinstall the quartz sleeve following the directions in **Cleaning/Replacing a Lamp's Quartz Sleeve and O-Rings** on page 141. When complete, install the wave guide again.



The correct position of the wave guide is parallel to the side of the quartz sleeve and a distance of 0.75mm from the quartz sleeve.

- Step 14.** Follow the directions to reinsert the lamp and refasten the lamp's housing and connector See **Replacing a UV Lamp** on page 129.

10.11 Cleaning/Replacing the UV Intensity Sensor's Mirror



If your system includes UVIS mirrors:

For each lamp in the Atlantium Unit, there is a small internal mirror (A) for directing UV light into the sensor. The UV Intensity Sensor's Mirror must be cleaned every time the lamps are replaced.

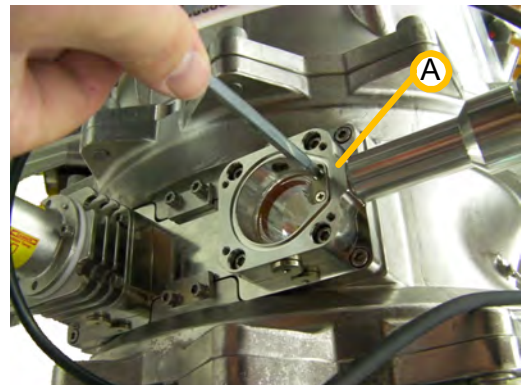


Figure 10-20: (Generic) Cleaning the UV Intensity Sensor's Mirror

Prepare the following:

- Replacement UV Intensity Sensor's Mirror
- Isopropanol and lint-free lens cleaning paper
- Small Phillips screwdriver

➔ To clean the mirror:

- Step 1.** No particular parts need be removed from the Unit in order to access the mirror for cleaning, once the lamp has been removed. See page 129 for instructions on replacing the lamp.
- Step 2.** Clean the reflective side of the mirror – the side facing into the Unit – with isopropanol and lint-free lens cleaning paper.
- Step 3.** Ensure that the mirror is completely dry before re-assembling the UV lamp.
- Step 4.** Examine the mirror's surface after cleaning and before you close the UV lamp' housing. Fingerprints or other stains may cause erroneous UV intensity sensor readings. If the mirror's surface is damaged, it must be replaced.

➔ To replace the mirror:

- Step 5.** Once the lamp has been removed, you can replace a damaged mirror. See page 129 for instructions on replacing the lamp.
- Step 6.** Using a small Phillips screwdriver, remove the two screws holding the mirror in place and remove the mirror.
- Step 7.** Clean the reflective side of the replacement mirror with isopropanol and lint-free lens cleaning paper.
- Step 8.** Examine the mirror's surface after cleaning and before you install it to make sure it is damage-free.
- Step 9.** Carefully place the new mirror in position and using the screwdriver, fasten it securely.
- Step 10.** Before you close the UV lamp' housing, examine the mirror's surface it make sure it is free of fingerprints or other stains, which may cause erroneous UV intensity sensor readings. Clean it again if necessary.
- Step 11.** Ensure that the mirror is completely dry before re-assembling the UV lamp.



Figure 10-21: Removing the Mirror



Figure 10-22: Cleaning the Replacement Mirror

10.12 Cleaning/Replacing a Lamp's Quartz Sleeve and O-Rings



The quartz sleeve is cleaned as needed according to the UVT Sensor readings and when deposit collects on the quartz sleeve. **The quartz sleeve's rubber O-rings must be replaced when dismantling the quartz sleeve.**

Depending on the quality of the water being treated by the Atlantium Unit, the exterior surface of the quartz sleeve that houses a lamp may require periodic cleaning or replacement if after the optional Cleaning system and the CIP process the quartz sleeve is still not sufficiently clean. This is to be determined by the quality control officer at the facility.

Under normal environmental conditions, the quartz sleeve's rubber O-rings (as shown in Section) must be replaced once a year even if they pass visual inspection. For environments where the water temperature is above 70°C (160°F), the quartz sleeve's O-rings must be replaced yearly.

Prepare the following:


- Replacement quartz sleeve (if replacing)
- Two O-rings (See view **B** in Figure 10-23 below)
- #3 Allen wrench
- #4 Allen wrench
- Protective gloves
- Appropriate cleaning cloth. A mild, household cleaning solution
- Alcohol

ATTENTION!

While carrying the steps of this procedure, check that the O-rings on the components, such as the lamp housings and holders, are not damaged. If damaged, replace them before refastening the component in place.

➔ To clean or replace the quartz sleeve:

Powering Down the System

- Step 1.** On the **Control Module**, tap  to switch lamps off. Wait approximately three minutes for the **Ready Lamps Off** signal to transmit.



A severe danger of electrocution exists if the lamp is not turned off during replacement. Be absolutely sure you have turned off the correct lamp before you proceed to replace the lamp.

- Step 2.** Using the viewport on the Atlantium Unit, check that the lamps are indeed turned off.
- Step 3.** Check the main screen of the **Control Module** and verify that the system parameter for **Power** is **0%**.

Isolating the Unit

- Step 4.** To isolate the Unit, close the Inlet and Outlet valves.
- Step 5.** Using the Drain valve, drain the water from the Unit.

Accessing the Quartz Sleeve

Quartz sleeve removal requires that the lamp connector assemblies, lamp housings (on both ends of the lamp) and the lamp be removed, as well as the quartz sleeve holder.

- Step 6.** Quartz sleeve removal requires that the lamp connector assemblies, lamp housings (on both ends of the lamp) for systems that have them, and the lamp be removed. In the section, 10.9.4. Replacing the Lamp, follow from **Step 2.** on page 139 and remove the lamp connector assembly and lamp housing **from both sides of the Unit**, as well as the lamp, placing them in a secure location until they need to be reinstalled.



While pulling the lamp housing away, **DO NOT** tilt it and **DO NOT** pull it away from the lamp/sleeve axis at an angle. For systems with wave guide, the wave guide is fragile. Take care not to damage it when removing the lamp housing.

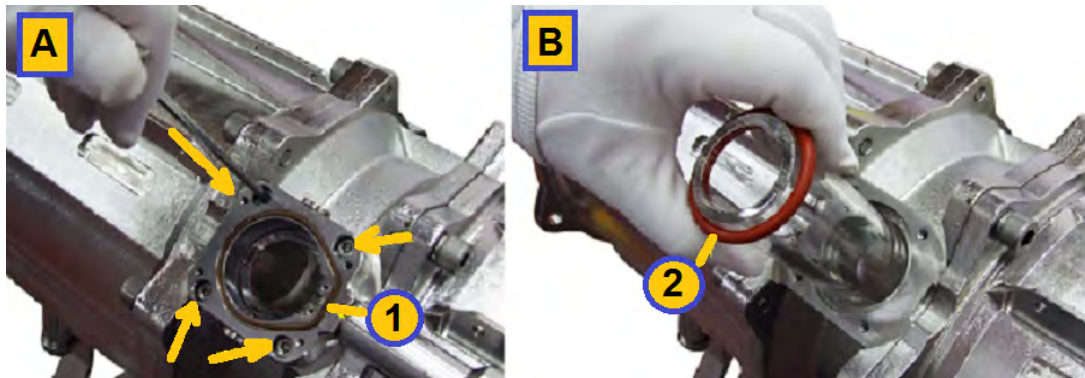


Figure 10-23: Replacing the Quartz Sleeve (Generic View 1)

- Step 7.** On one side of the quartz sleeve, using a #4 Allen wrench, remove the four Allen screws, opening them in a diagonal pattern (i.e. upper left, lower right, upper right, lower left) (arrow indicate the screws in view **A**) that secure the sleeve holder to the Unit. Loosen one screw gradually (2 turns) on one side and do the same on the screw at the diagonal opposite side of the sleeve (2 turns).
- Step 8.** Continue to alternate until both sleeve holders are loose, and then remove the screws completely.
- Step 9.** On the other side of the quartz sleeve, repeat **Step 6.** to **Step 8.**

Removing the Quartz Sleeve



Wear protective gloves. To protect the quartz sleeve, do not touch the internal surface with your bare hands.

- Step 10.** On one side of the quartz sleeve, place the gloved palm of your hand over the quartz sleeve and gently push in. The quartz sleeve shifts inward. The o-ring on the side where you pushed slips out (if not, take it off).
- Step 11.** On the other side of the quartz sleeve, the sleeve sticks out slightly. **To prevent any damage to the quartz sleeve, make sure you pull the lamp's connector assembly straight out.** Carefully pull out the quartz sleeve and remove the O-ring (shown in view **B** above).

Cleaning the Quartz Sleeve



While pulling the connector assembly away, **DO NOT** tilt it and **DO NOT** pull it away at an angle.

- Step 12.** If there is a deposit buildup on the sleeve's exterior surface, clean it with a mild, household cleaning solution.
- Step 13.** Clean the exterior and interior surfaces with alcohol. If the sleeve cannot be cleaned to a pristine condition, replace it with a new one.
- Step 14.** Ensure that there is no residual moisture or high humidity on the inner surface of the quartz sleeve. If any visible moisture exists, dry it before inserting it in place.

Installing the Quartz Sleeve

- Step 15.** Mount the new O-ring onto the quartz sleeve (as shown in view **B** in Figure 10-23 above) and insert the sleeve into the Unit. Make sure it is centered.
- Step 16.** Add the second new O-ring on the other side of the quartz sleeve.
- Step 17.** Install the quartz sleeve holder on the side without the UVIS mirror and close it loosely with 4 screws in a diagonal pattern (upper left, lower right, upper right, lower left). **Do not tighten the screws!!**



Figure 10-24: Replacing the Lamp's quartz sleeve (Generic View 2)

Assembly

- Step 18.** Install the quartz sleeve holder on the opposite side – the one with the UVIS mirror or wave guide.




For systems with wave guide, while reinstalling the sleeve holder, DO NOT tilt it and DO NOT insert it at an angle. the wave guide is fragile. Take care not to damage it when inserting the lamp housing.

- Step 19.** Install the quartz sleeve holder on the lower side and close it loosely with 4 screws in a diagonal pattern (upper left, lower right, upper right, lower left). **Do not tighten the screws!!**
- Step 20.** Install the quartz sleeve holder on the upper side.
- Step 21.** Using a #4 Allen wrench, close the screws in diagonal pattern and tighten them.
- Step 22.** To reinstall the lamp, See **Replacing a UV Lamp** on page 129.
- Step 23.** Reinstall the lamps' connector assemblies pushing each straight in and using the # 4 Allen wrench, fasten the four Allen screws with their washers to secure them to the Unit.
- Step 24.** Connect the UVIS sensors' cables.
- Step 25.** On the corresponding Connection Box to where the sleeves/lamps are located, turn the switch to the **On** position.

Reintroducing the Water

- Step 26.** Carefully open the Inlet and Outlet valves (Be sure to avoid water hammer). Follow the directions in the section **Filling unit with water** on page 103.

Powering Up the System

- Step 27.** On the **Control Module**, tap . The button turns green. Wait approximately three minutes for the **Ready Lamps ON** signal to transmit.

Verifying System Performance

- Step 28.** Wait 10 minutes for lamps to turn on and the system to stabilize.
- Step 29.** Open the viewport and check that there are no air bubbles in the water flow. If necessary, release all air bubbles from within the system.
- Step 30.** Run the system with the breather caps of the lamp off as described in the section, 10.9.4. Replacing the Lamp.
- Step 31.** Check the main screen of the **Control Module** and verify that the Atlantium system parameters for **Power**, **Flow**, and **UVT** are within wanted acceptable range and record is using the Table in Appendix B. Checking the System Parameters on page 187.
- Step 32.** If the values are out of range, notify the executive maintenance engineer

10.13 Checking/Replacing UVIS Sensors

Performed
as needed

- From time to time, sensors may need to be checked and wiped clean (most frequently, from condensation).
- During the Calibration process, the UVIS sensor also requires to be removed and temporarily replaced with a Reference Master sensor.
- Sometimes a sensor has to be replaced.

There are two types of UVIS sensors. The sensor itself is the same in both types. The casings of both types are marked with a millimeter scale (Figure 10-25) which enables the sensor to be removed for cleaning and replaced in precisely the same position.

The casing markings also include the sensor's sensitivity range (4 - 20 mA / 10Wm²) part number and serial number.



Figure 10-25: Sensor casing, showing millimeter scale

The difference between sensor types is in how they are fastened to the Atlantium Unit. The two types are:

- **Adjustable UVIS sensor** - The Sensor's position is adjustable and its casing is fastened with nuts. See below.
- **Fixed UVIS sensor** - The sensor's casing screws into a fixed position. This type of sensor may include a cover with a pinhole. See *Replacing/Checking a UVT Sensor* on page 149.

Prepare the following:

- Wrenches # 24 and # 30

➔ Checking position of a UVIS sensor

- Step 1.** Before removing the UVIS sensor, look at the point where the millimeter scale on the sensor touches the securing nut (A in Figure 10-26).
- Step 2.** Record this point on mm scale as a reference for returning the sensor to same position after cleaning.

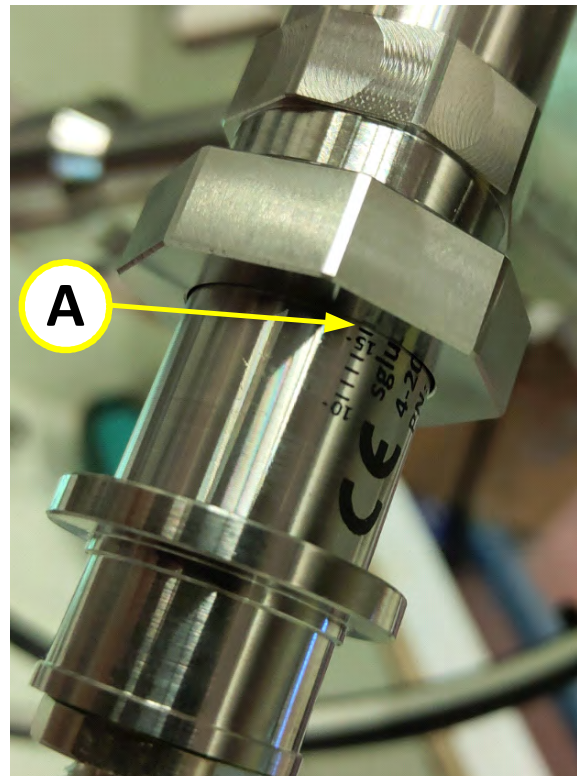


Figure 10-26: Using mm scale as position reference

➡ To remove a fixed sensor:

Step 3. To disconnect the harness connector (shown by the arrow in view **A** below), unscrew the sensor's threaded locking nut



Figure 10-27: Removing a Sensor A (Generic View)

Step 4. Unscrew the sensor's threaded locking nut from the bottom of the sensor housing, as shown in view **B**



Figure 10-28: Removing a Sensor B (Generic View)

Step 5. Carefully pull the sensor out of the housing (**C**). If a pinhole (**D**) is present it slides out. Ensure that the rubber washer stays in place.

Step 6. Proceed to **Returning cleaned sensor into place** on page 149



Figure 10-29: Removing a Sensor C 2 (Generic View)

➤ To remove an adjustable UVIS sensor:

- Step 1.** To disconnect the harness connector (shown in view **A**, Figure 10-30), unscrew the sensor's threaded locking nut.

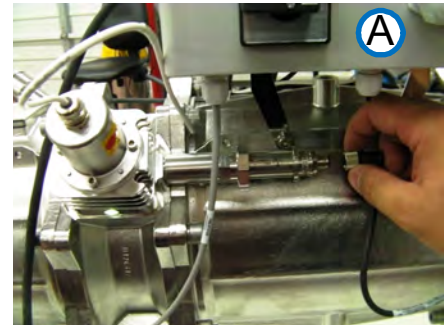


Figure 10-30: Removing connector A (Generic View)

- Step 2.** Grip the Sensor casing with wrenches # 24 and # 30, as shown in view **B**, Figure 10-31. The inset shows the wrench #24 in the left hand gripping the casing's left band and wrench #30 in the right hand gripping the casing's large nut on the right.
- Step 3.** Carefully pull the sensor out of the housing (Figure 10-29). If a pinhole (**D**) is present it slides out. The large nut comes off together with the sensor.

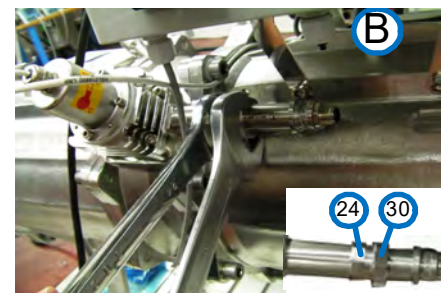


Figure 10-31: Loosening nuts B (Generic View)

➤ Cleaning a sensor

- Step 4.** Check the sensor's lens (**1** in Figure 10-32) for condensation. If present, using a dry lens cloth, dry the lens thoroughly.
- Be sure that the lens is completely dry before it is returned to its place.**
- Step 5.** Ensure that threaded locking nut (**2**) and washer (**3**) are in place
- Step 6.** If replacing a sensor with a new one, go to **Step 13**.

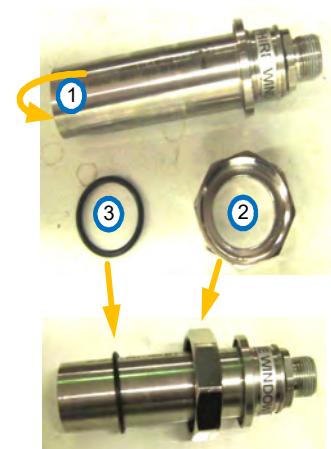


Figure 10-32: Sensor, nut and washer

➞ Returning cleaned sensor into place

- Step 7.** Slide pinhole (if present) back into place over the end of sensor housing.
- Step 8.** When you return the sensor to its place, make sure to insert it to the same reference point on the mm scale (**A** in Figure 10-26) recorded in **Step 1.** on page 146.
- Step 9.** Ensure that the washer on the sensor screw thread is in place. Replace as necessary.
- Step 10.** To re-install an **adjustable sensor**, tighten both nuts by reversing process in **Step 2.** on page 148.
- Step 11.** To re-install a **fixed sensor**, tighten the threaded cap back onto the housing, Figure 10-28.
- Step 12.** In the **Control Module**, check that the value for UVIS for the lamp on which the sensor was replaced is identical to the value before the sensor was removed. For details on finding the **Control Module** screen with this information, see the section, **System Tuning** on page 151.

➞ Replacement with new sensor

- Step 13.** Unpack the new sensor (Figure 10-32) and the sensor pinhole (**D** in Figure 10-29, if supplied).
- Step 14.** To enable the system to track relevant data about the sensor, make a note of its serial number.
- Step 15.** Verify that the sensor lens (**F**) is clean. If needed, using a lens cloth, clean it.
- Step 16.** If a pinhole (**E**) is present, insert it.
- Step 17.** Insert the sensor into the housing and reinstall as in **Step 10./Step 11.** above.
- Step 18.** Reconnect the harness's threaded cap to the new sensor.
- Step 19.** In the **Control Module**, perform **System Tuning**, on page 151.

10.13.1 Replacing/Checking a UVT Sensor



UVT sensors should be cleaned/replaced as required. The procedure is the same as that described for **fixed** UVI sensors in **Replacing/Checking a UVT Sensor** on page 149. For some of the sensors, there is a pinhole located on the sensor's window. This pinhole is calibrated by Atlantium for the specific measurement point. Do not switch disks between ports. Before inserting the sensor, be sure to include the pinhole if present.

➞ To replace a sensor:

- Step 1.** To disconnect the harness connector (shown by the arrow in view **A** below), unscrew the sensor's threaded locking nut.
- Step 2.** Unscrew the sensor's threaded locking nut from the bottom of the sensor housing, as shown in view **B**.



Figure 10-33: Replacing the Sensors 2 (Generic View)



Figure 10-34: Replacing the Sensors 2 (Generic View)

- Step 3.** Carefully pull the sensor out of the housing (C).
- Step 4.** If an pinhole (E) is present it slides out.
- Step 5.** Unpack the new sensor (D) and (if it is supplied) the sensor pinhole.



Figure 10-35: Replacing the Sensors 4 (Generic View)



Figure 10-36: Replacing the Sensors 3 (Generic View)

- Step 6.** To enables the system to track relevant data about the sensor, make a note of its serial number.
- Step 7.** Verify that the sensor lens (F) is clean. If needed, using a lens cloth, clean it.
- Step 8.** If an pinhole (E) is present, insert it.
- Step 9.** Insert the sensor into the housing, and screw the threaded cap back into the housing to secure the sensor.
- Step 10.** Reconnect the harness's threaded cap to the new sensor.
- Step 11.** In the **Control Module**, perform **System Tuning**, see the section, **System Tuning** on page 151.

10.14 Testing System Lamps



During normal operations, an authorized facility technician may need to test the lamps that appears on the Tech Monitor screen.

➔ To test the lamps:

- Step 1.** At the top of the screen, tap . The **Monitor Tab** is displayed.
- Tap the **Tech Monitor Tab**. The **Tech Monitor** screen appears.



Figure 10-37: Tech Monitor Tab

- Step 2.** For each lamp to be tested according to the **Lamp ID** column on the left, make a mark in the checkbox on the right.
- Step 3.** To adjust the power of the selected lamp(s), using the **-/+** buttons, set the desired power value. Check that the values for the other columns are in normal range.
- Step 4.** To Turn off the he selected lamp(s), tap **Lamp Off**. The Lamp's **On/Off** icon turns grey. Check that the selected lamp is indeed off. Check that the values for the other columns are in normal range.
- Step 5.** To Turn on the he selected lamp(s), tap **Lamp On**. The Lamp's **On/Off** icon turns green. Check that the selected lamp is indeed on. Check that the values for the other columns are in normal range.

When leaving the **Tech Monitor tab**, the lamps are returned to the settings of the system's configuration.


10.15 System Tuning



System tuning is performed on these occasions:

- As the last step in system installation
- As the last step when lamps are changed and after 100 operating hours (as needed)
- Upon advice of an Atlantium Service Representative when the system is reset

➤ To tune the Atlantium system:

- Step 1.** Just prior to tuning, obtain a water sample from the sampling valve on the inlet side of the Atlantium Unit. Test the water sample in an external spectrophotometer. Write down the results. If a spectrophotometer is not available, record the current UVT value shown on the system's display.
- Step 1.** On the **Control Module**, tap  to switch lamps off. Wait approximately three minutes for the **Ready Lamps Off** signal to transmit.
- Step 2.** On the Atlantium Unit, locate each UVIS and UVT Intensity Sensor.
- Step 3.** On each sensor (refer to the figures in the section, **Checking/Replacing UVIS Sensors** on page 145):
- a Unscrew the locking nut and gently pull out the sensor.
 - b With a dry and clean lint free cloth, wipe the UVIS sensor's quartz window.
 - c Reinsert the sensor and replace the locking nut.

- Step 4.** To turn on the Atlantium system, on the **Control Module** main screen, tap . The button turns green. Wait approximately three minutes for the **Ready Lamps On** signal to transmit. At the top of the screen, tap . The **Monitor Tab** is displayed.

Tap the **Tuning Tab**. The **Tuning** screen



Lamp ID	UVIS mA	UVT %	Status %	UVTS mA	Tuning status %	
1	17.8	97.0	100	18.0	- 100% +	<input type="checkbox"/>
2	17.8	97.1	100	18.0	- 100% +	<input type="checkbox"/>
3	17.8	0.0	100	0.0	- 100% +	<input type="checkbox"/>
4	17.8	97.1	100	18.0	- 100% +	<input type="checkbox"/>
5	17.8	0.0	100	0.0	- 100% +	<input type="checkbox"/>
6	17.8	0.0	100	0.0	- 100% +	<input type="checkbox"/>
7	17.8	0.0	100	0.0	- 100% +	<input type="checkbox"/>
8	17.8	0.0	100	0.0	- 100% +	<input type="checkbox"/>

Tuning reason: Select reason Set UVT: - 97.0% + Done: 0% Start tuning

System On, Ready 10/07/2018 01:26 PM


appears.  System On, Ready

Figure 10-38: Technician Settings Screen> Tuning Tab (Actual numbers vary according to system configuration)

- Step 5.** Verify that the lamps are on and enabled (the number of lamps listed in the display is according to the number of lamps in your system configuration). For each lamp to be tuned, according to **Lamp ID** in column 1, make a mark in the appropriate checkbox in the last column on the right.
- Step 6.** Under **Status TO %**, using the **-/+** buttons, set the **Status TO percentage** up to **100%**.
- Step 7.** Wait a few minutes to allow the system to stabilize.
- Step 8.** To verify that the Sensor readings are stable, observe the reading for a few seconds to see that they remain the same numbers. For the UVIS sensor, see the **UVIS mA** column above. For the UVT Intensity sensor, see the **UVTS mA** column above. If the numbers are not stable, unscrew and remove the two breather caps on each side of the lamp. (See Figure 10-14 on page 138.)
- Step 9.** Leave the breather caps open for 30 minutes to make sure no humidity is present in the lamp housing. Then replace the breather caps and check the sensor reading again.



When the Lamp's breather caps are removed, do not look directly into the opening without appropriate eye protection. The UV light emitted via the opening is a danger to the eyes.

- Step 10.** At the bottom of the screen, for **UVT To**, enter the current UVT value obtained from the spectrophotometer that you wrote down in **Step 14.** above (or the recorded current UVT value).
- Step 11.** To record the reason for tuning the system, At the bottom of the screen, for **Tuning Reason**, from the dropdown list, select the reason.

The options are:

- System Integration
- Lamp changed


■ Maintenance

Step 12. Tap **Start Tuning**. A progress bar appears at the bottom of the screen. The process takes about 6 to 15 minutes.



If the system is not running, or if a lamp is not on, a popup message appears informing you that in order to start a tuning process, the system must be running.


Step 13. Verify that the UVT is the number you set previously (see the **UVTS mA** column) and that the Status on the Monitor tab is the same as the number you set in the **Status T0 %** column.


Step 14. To shutdown the Atlantium system, on the **Control Module** main screen, tap  and wait approximately three minutes for the **Ready Lamps Off** signal to transmit.

Step 15. On the Atlantium Unit, locate each UVIS and UVT Intensity Sensor.

Step 16. On each sensor (refer to the figures in the section, *Replacing/Checking a UVT Sensor* on page 149):

- a Unscrew the locking nut and gently pull out the sensor.
- b With a dry and clean lint free cloth, wipe the UVIS sensor's quartz window.
- c Reinsert the sensor and replace the locking nut.

Step 17. To turn on the Atlantium system, on the main screen, tap  and wait approximately three minutes for the **Ready Lamps On** signal to transmit.

Return to the AIO Monitor screen (see Figure on page 132). Under **Lamp Enabled**, for each lamp you want to enable, tap the checkbox  to fill it. The corresponding lamp is enabled.

10.16 Advanced Maintenance

The advanced maintenance procedures require opening the Connection Box. **Local regulations may require a certified electrician to perform any of these procedures.**

This section contains:

- *Replacing the Temperature Sensor* on page 154
- *Replacing the Temperature Converter Card* on page 155

10.16.1 Replacing the Temperature Sensor



In the event that the Temperature sensor requires replacement, this section details the procedure.



Follow your local regulations regarding whether a certified electrician may be required to perform this procedure.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Prepare the following:

- Replacement Temperature sensor
- #5 Allen wrench
- #3 Flat screwdriver
- #2 Phillips screwdriver

➔ To replace the Temperature sensor:

- Step 1.** Turn the Mains circuit breaker to the **Off** position.
- Step 2.** Using the appropriate Allen wrench, open the Connection Box cover.
- Step 3.** Verify with volt meter that there is no power in first Connection Box card and that no LED is lit on the card.
- Step 4.** Locate and disconnect the Temperature Sensor connector **(A)**.
- Step 5.** Detach the wire from the terminal connector and remove the wire from the Connection Box via the gland.
- Step 6.** Using a #2 Phillips screwdriver, detach the temperature sensor **(C)** from the Atlantium Unit.
- Step 7.** Attach the replacement Temperature sensor **(C)** to the Atlantium Unit.
- Step 8.** Thread the wire through the gland and attach it to the terminal connector.
- Step 9.** Insert the connector **(A)** to its socket on the terminal block.
- Step 10.** Return the Connection Box cover and using the Allen wrench, fasten the screws. Tighten them in a diagonal pattern.
- Step 11.** Turn the Mains circuit breaker to the **On** position.

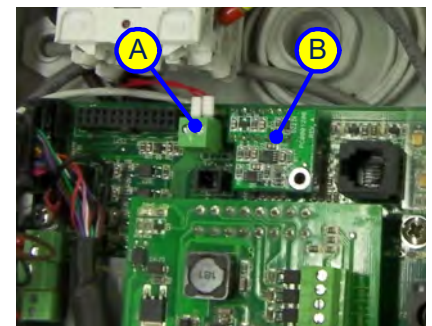


Figure 10-39: Location of the Temperature Sensor Connector (Generic)

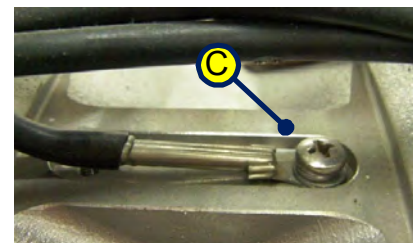


Figure 10-40: Location of the Temperature Sensor on the Atlantium Unit

10.16.2 Replacing the Temperature Converter Card



In the event that the Temperature sensor card requires replacement, this section details the procedure.



Follow your local regulations regarding whether a certified electrician may be required to perform this procedure.



Any person involved in handling the Connection Box card or its components is required to wear an electrostatic discharge (ESD) Wrist Strap.

Connect the ESD Wrist Strap to any bolt on the body of the Atlantium Unit or to the metal bracket under the Connection Box using a banana plug or an alligator clip.

Prepare the following:

- Replacement Temperature Converter card
- #5 Allen wrench
- #2 Phillips screwdriver

➔ To replace the Temperature sensor card:

- Step 1.** Turn the Mains circuit breaker to the **Off** position.
- Step 2.** Using the appropriate Allen wrench, on the first Connection Box, open the Connection Box cover.
- Step 3.** Verify with volt meter that there is no power in first Connection Box card and that no LED is lit on the card.
- Step 4.** Locate and carefully pull off the Temperature Sensor card **(C)**.
- Step 5.** Aligning the pins of the replacement Temperature Sensor card **(C)** with the connector (on the board) on the Connection Box card, carefully insert the small card into the connector of the Connection Box card.
- Step 6.** Return the Connection Box cover and using the Allen wrench, fasten the screws. Tighten them in a diagonal pattern.

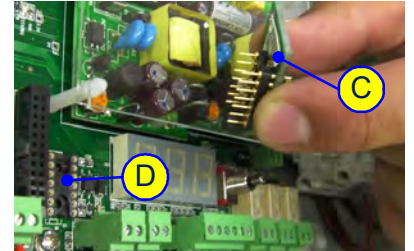


Figure 10-41: Replacing the Temperature Sensor Card (Generic)

➤ Viewing Maintenance Report

To view a report:


At the top of the screen, tap . The **Monitor Tab** is displayed. Tap the **System Parts tab**. The **System Parts** screen appears. Tap **View Report**. The report displays accordingly. (The reports contain information for the components listed in the table below:

Table 10-1: Report Contents

Component Type	Details Provided
Lamps	<ul style="list-style-type: none"> ■ Unit number ■ Lamp number ■ Last operator who installed or modified the component ■ Date of Installation ■ Date of Replacement (if replaced) ■ Reason for Replacement (if replaced) ■ Age in hours ■ Number of Ignitions ■ Serial number
UVI Sensor	<ul style="list-style-type: none"> ■ Unit number ■ Associated lamp number ■ Last operator who installed or modified the component ■ Date of Installation ■ Date of Replacement (if replaced) ■ Reason for Replacement (if replaced) ■ Age in hours ■ Serial number
UVT Sensor	<ul style="list-style-type: none"> ■ Unit number ■ Associated lamp number ■ Last operator who installed or modified the component ■ Date of Installation ■ Date of Replacement (if replaced) ■ Reason for Replacement (if replaced) ■ Age in hours ■ Serial number

Table 10-1: Report Contents

Component Type	Details Provided
Ballasts (Modules)	<ul style="list-style-type: none"> ■ Unit number ■ Associated lamp number ■ Last operator who installed or modified the component ■ Date of Installation ■ Date of Replacement (if replaced) ■ Reason for Replacement (if replaced) ■ Age in hours ■ Number of Ignitions ■ Serial number
Cleaner (if installed)	<ul style="list-style-type: none"> ■ Unit number ■ Lamp number ■ Last operator who installed or modified the component ■ Date of Installation ■ Date of Replacement (if replaced) ■ Reason for Replacement (if replaced) ■ Counter ■ Type
UVI Reference Sensor	<ul style="list-style-type: none"> ■ Unit number ■ Last operator who installed or modified the component ■ Date of Installation ■ Reason ■ Expiration date ■ Serial number



11 Troubleshooting

11.1 Viewing system errors

The sections headers in this chapter are comprised of message headers that appear as error messages on the Event log screen of the **Control Module**.

ID	Description	Date	Time
1	Dose above maximum defined level [73]	01/23/2019	09:26:09 AM
20	System ignition stage completed [72]	01/23/2019	09:25:39 AM
61	System ready [71]	01/23/2019	09:25:38 AM
18	System tuned On automatically: power restored. [70]	01/23/2019	09:25:21 AM
101	Communication restored [69]	01/23/2019	09:25:21 AM
65	Controller turned On [68]	01/23/2019	09:25:21 AM
1	Dose above maximum defined level [67]	01/22/2019	04:27:44 PM
20	System ignition stage completed [66]	01/22/2019	04:27:14 PM

Figure 11-1: Event log screen

11.2 Troubleshooting issues

The temperature is too high on page [169](#)

Temperature is critically high! on page [169](#)

The UV Lamp unexpectedly shut down on page [173](#)

The rate of the water flow is too low / too high on page [171](#)

UVT is too low! on page [171](#)

UV Lamp ignition failed! on page [172](#)

Control Module power failure on page [173](#)

Ballast Module communication error on page [174](#)

The UV Lamp unexpectedly shut down on page [173](#)

CRC error on page [174](#)

Each event/alarm provides the following additional information:

- System power
- System dose

- System flow
- System status
- System UVT
- System Temperature

11.3 Voltage Error Codes

For Ballast Module version C, the Voltage parameter provides a value that functions as an additional Error code and indicates additional information about the fault. See ***Lamp Failure codes in Technician screen 3*** on page **66**.

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
0 (± 24)	Unknown	Input voltage at one of the three phases is low	1 At the output side of the ballast's Circuit Breaker/fuses , check that the input voltage of the ballast is in the proper range at all three phases. Make sure that the ballast harness and input wires are properly secured tightly.
			2 If the voltage is within range, and the wires are secured tightly, try to reignite the lamp. If the lamp reignites, wait 10 minutes and see if the ballast is working properly.
		Internal fault at the ballast	3 If the problem reappears, or the lamp does not ignite, replace the ballast.
			Problem in all ballasts at the same time:
			1 Try to locate the point where the voltage is low in the input phases feeding the ballasts.
			2 If all of the voltage lines are in range, check for the source of the input voltage sags and stabilize the voltage.
50 (± 24)	Lamp nominal voltage too low	input voltage is too high	1 Check that the input voltage of the ballast is in the proper range and if yes try to reignite lamp. If the lamp reignites wait 10 minutes and see if the ballast is working properly.

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
-		faulty ballast	2 If problem appears again or lamp does not start properly replace the ballast.
		faulty lamp	3 If the problem is not fixed replace the lamp.
100 (± 24)	Lamp nominal voltage too high	faulty lamp	If the problem is not fixed replace the lamp.
150 (± 24)	Device cooling *	Room's ambient temperature is above 45°C The ballast fan is faulty or faulty ballast	1 Check the room temperature. If it is too high, reduce the temperature via external means.
			2 Reignite the lamp and check that the ballast external fan is working. If not, try to clean it or replace it. If it is still not working replace the ballast
200 (± 24)	Lamp Internal failure / Phase lost	One phase of the supply is down due to a ballast CB / Fuse fault or wire disconnection at the input of the ballast	Problem in one ballast

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
250 (± 24)	Lamp earth short circuit	One of the lamp's wires is touching the ground	1 Disconnect the faulty ballast from the supply by switching off its switch. Disconnect the Ballast wire connector and check using a DVM if there is short circuit between one of the lamp phases to the ground. If a short circuit is detected, locate the short circuited segment (junction box to ballast or junction box to lamp) and replace it.
300 (± 24)	Lamp not ignited / gone out	Ballast cable fault	1 Inspect the ballast cable & connectors between the electrical junction box and ballast.
		Faulty ballast/ Faulty lamp	2 Switch the cables between the ballast of the faulty lamp and the nearby ballast of a working lamp. If lamp doesn't work, replace lamp. If lamp works, replace the Ballast.
		Lamp connector	3 Check the lamp connector and if damaged, replace it and the lamp.

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
350 (± 24)	Lamp short circuit	Cable fault	1 Disconnect the ballast and check that there is no short circuit between lamps wires
		Faulty ballast	2 Replace the ballast and check again. If the new ballast works, it means the cause was an internal ballast short circuit. Reduce the number of lamp ignitions per ballast to not more than six ignitions per day.
		Water inside the lamp sleeve	3 Replace the sleeve's O-rings
400 (± 24)	LAMP X MAINS UNDERVOLTAGE	Input voltage of the ballast is low due to a ballast CB fault or wire disconnection at the input of the ballast	Problem in one ballast
		Low voltage or loss connection	1 At the output side of the ballast's Fuses (inside the Junction Box) , check that the input voltage is according to the allowed range at all three phases. Make sure that the ballast harness and input wires are properly secured tightly.
	Phase failure mains voltage		2 If the voltage is valid and the wires are secured tightly, try to reignite lamp. If the lamp reignites, wait 10 minutes and see if the ballast is working properly.
		Faulty ballast	3 If problem appears again, or the lamp does not ignite, replace the ballast.
			Problem in all ballasts at the same time:

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
		Low voltage	1 Try to locate the point where the voltage is low in the input phases feeding the ballasts.
			2 If all of the voltage lines are in range, check for the source of the input voltage sags and stabilize the voltage.

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
450 (± 24)	Mains over-voltage	Input voltage is too high (above 565V) or unbalanced voltage supply	Problem in one ballast
		Voltage out of range	1 At the output side of the ballast's Fuses (inside the Junction Box) check that the input voltage of the ballast is in the proper range at all three phases.
			2 If the voltage is valid and the wires are fixed, try to reignite the lamp. If the lamp reignites, wait 10 minutes and see if the ballast is working properly.
		Faulty ballast	3 If the problem appears again at just one ballast, or the lamp does not start properly, replace the ballast.
			Problem in all ballasts at the same time:
		Unbalanced voltage supply	1 Verify that the the voltage supply is balanced (the three phases to PE voltages are equal $\pm 10\%$). If not create balanced supply by isolation transformer
		Voltage out of range	2 Check for the source of the input high voltage and stabilize the voltage.

Table 11-2: Voltage Error Codes and Troubleshooting procedures

Lamp voltage value when lamp is off = Error Code	Lamp turn off reason	Probable Cause	Troubleshooting
500 (± 24)	Manual switch off		NA
600 (± 50)	Loss of ballast's internal parameters***		NA

* Voltage of lamp is low while the current to the lamp is at the maximum allowed value – in this state, the required power cannot be delivered to the lamp.

** The voltage required by the lamp cannot be created by the ballast. The current going to the lamp is zero.

*** In case of loss of internal ballast parameters, consult with Atlantium service personnel for instructions on how to solve this issue.

YPay attention to the following safety notes when reviewing the troubleshooting issues:



The solution to the problem might involve exposure to UV light.

The system generates ultraviolet (UV) light within the Atlantium Unit, which can cause serious eye damage or blindness if you stare at it directly when it is working.

Do not look directly into the lamp enclosure during system operation, or while examining or servicing the system's internal components when the system is operating, or when a lamp's breather caps are open.



The solution to the problem might involve working in a high-voltage environment.

Before replacing a UV lamp or other components, and during any maintenance requiring lamps to be turned off, **turn the main circuit breaker to the Off position.**

Place a sign on the relevant switch and **Control Module** alerting others **NOT** to touch the switch and touch screen during maintenance so that no one can inadvertently turn it on while maintenance is in progress.



The solution to the problem might involve working with hot surface.

Do not touch the UV lamp with your bare hands. Lamps can reach a temperature of 1,000°C under operating conditions.

Wait at least 10 minutes until the lamp is cooled down before replacing it.

Use appropriate protective gloves both to protect your hands and to avoid skin oils that leave fingerprints and/or harm the UV lamp.

11.4 The dose is above the maximum dose


Event Index	Control Module displays this warning message
1	The dose is above the maximum defined in the system settings

	Possible Cause	Solution
1	The current flow rate is too low. An upstream process has obstructed the flow rate.	Check the upstream piping and the components installed there, such as the pumps, filters.
2	The Max Dose parameter is set too low.	In the Control Module , raise the Max Dose setting. See Configuring Dose Settings on page 91.
3	The system is set for a constant power that is too high given the current water flow.	In the Control Module , change the Operation Mode from Power to Dose setting. See Configuring Dose Settings on page 91.

11.5 The UV dose is too low

Event Index	Control Module displays this warning message
2	Dose too low! Below minimum!

!

	Possible Cause	Solution
1	The Water flow rate is too high.	Check the water flow on the Control Module's main screen. If it is higher than normal, decrease the rate of the water flow through the system. See Configuring the Flow Settings on page 61.
2	UVT has declined because of chemicals (chlorine, etc.) or solids (sand, silt, etc.) in the water flow.	Carry out cleaning procedures. See Cleaning In Place (CIP) on page 100. Try to improve the water condition. Check on the status of upstream filtering equipment and upstream chemical processes.
3	UV lamp efficiency has dropped.	 <p>Check the UVIS sensors and clean them if necessary. Check the lamp's efficiency reading. If it is low, replace the lamp. See Lamp & UVIS Assembly on page 108.</p>
4	UVT has declined because of chemicals (chlorine, etc.) or solids (sand, silt, etc.) in the water flow.	Carry out cleaning procedures. See Cleaning In Place (CIP) on page 100. Try to improve the water condition. Check on the status of upstream filtering equipment and upstream chemical processes.
5	The UVT sensor has malfunctioned.	Switch between the UVT and UVIS sensors and see if the reading increased. If the reading is increased, switch the sensors back and replace the UVT sensor. See Replacing/Checking a UVT Analyzer or UVIS Sensor on page 129.
6	The system is operating on Power mode instead of Dose mode .	If the system settings are in Power mode, in the Control Module , access the Settings screen and change the Operation Mode from Power to Dose setting. Or, change the Power mode settings to allow higher power to respond to operating conditions. See Configuring the Operation Mode on page 60.


11.6 The temperature is too high

Event Index	Control Module displays this warning message
4	The lamp's temperature getting too high - check water flow

	Possible Cause	Solution
1	The Max temperature value is too low.	Check the system's Max Temperature settings. See <i>Configuring the General & Connection Settings</i> on page 95.
2	The water flow has significantly decreased.	Check the flow reading in the Control Module to see if it has deviated from normal flow. Check the flow via the flow meter. Check the water source for a problem.
3	There are air bubbles or the system is not fully filled with water.	Verify this by looking through the Atlantium Unit's view port.
4	You did not install a designated air release valve at the highest point on the inlet side of the system.	Release the air by installing a designated air release valve at the highest point on the inlet side of the system.

11.7 Temperature is critically high!

Event Index	Control Module displays this warning message
5	The lamp's temperature is too high and the unit will shut down

	Possible Cause	Solution
1	If this message appeared right after a BM Communication Error message (and both messages refer to the same lamp) and the temperature display on the monitor is 165°C/329°F, then most likely the communication between the Control Module and the Connection box is lost.	Follow the solutions offered in <i>CRC error</i> on page 174.
2	The temperature reading dropped to 0°C / 32°F due to a short-circuit in the Temperature sensor or Connection Box Card	 Replace the temperature sensor. See <i>Replacing the Temperature Sensor</i> on page 131. If the problem still persists replace the Connection Box card. Contact your Atlantium Service representative.
3	The Max temperature value is too low.	Check the system's Max Temperature settings. See <i>Configuring the Technician Settings</i> on page 64.
4	There is no water flow.	Check the flow reading in the Control Module's main screen to see if it has deviated from normal flow. Check the flow via the flow meter. Check the water source for a problem.





	Possible Cause	Solution	
5	There are air bubbles or the system is not filled with water to capacity.	Verify this by looking through the Atlantium Unit's view port.	
6	You did not install a designated air release valve at the highest point on the inlet side of the system.	Release the air by installing designated air release valve at the highest point on the inlet side of the system.	
7	The Temperature sensor is faulty.		Replace the temperature sensor. See Replacing the Temperature Sensor on page 131.
8	Relevant for Ultrasonic Cleaner700/750 Connection Box Cards only: The Temperature jumper is missing.		Verify the existence of the Temperature jumper in its designated location on the Connection Box card #1. On the last Connection Box, open the top cover and locate Jumper J32 marked A in the figure. 

Figure 11-2: Jumper Location

11.8 Temperature sensor fault

Event Index	Control Module displays this warning message
6	One of the temperature sensors has malfunctioned or the communication with the Connection Box card was lost.

	Possible Cause	Solution	
1	If this message appeared right after a BM Communication Error message (and both messages refer to the same lamp) and the temperature display on the monitor is 0°C/32°F, then most likely the communication between the Control Module and the Connection box is lost.	Follow the solutions offered in CRC error on page 174.	
2	The temperature reading dropped to 0°C / 32°F due to a short-circuit in the Temperature sensor, or Connection Box Card		Replace the temperature sensor. See Replacing the Temperature Sensor on page 131. If the problem still persists replace the Connection Box card. Contact your Atlantium Service representative.




11.9 The rate of the water flow is too low / too high

Event Index	Control Module displays this warning message
10	The water flow rate is higher than the maximum flow rate defined in the system settings. Check the water flow. System turned off automatically - water flow too low/high

	Possible Cause	Solution
1	The water flow rate into the system is too high.	Decrease the rate of water flow from the facility to the Atlantium Unit.
2	Maximum allowable flow rate parameter is too low.	Increase the setting of the Maximum allowable flow rate parameter to the maximum allowable flow rate.

11.10 UVT is too low!

Event Index	Control Module displays this warning message
11	The UVT is lower than the minimum UVT defined in the system settings.










	Possible Cause	Solution
1	Minimum allowable UVT parameter is too high.	Decrease the setting of the Minimum allowable UVT parameter to the minimum allowable UVT.
2	The UVT sensor's lens is fouled.	 <p>Pull out the UVT sensor and see if the sensor's lens is foul or damaged. Clean the lens with a dry lens cloth. If it is damaged, replace the sensor with a new one and perform System Tuning according.</p>
3	Deposit has collected in the UV chamber or lamp's quartz sleeve.	Look through the Atlantium Unit's view port. If the color of the light is in a shade of green or yellow, it probably indicate there is deposit present. Perform CIP. Cleaning In Place (CIP) on page 100
4	There are air bubbles or the system is not filled with water to capacity.	Verify this by looking through the Atlantium Unit's view port.
5	You did not install a designated air release valve at the highest point on the inlet side of the system.	Install air release valve at the highest point on the inlet side of the system.
6	There is a leak inside the UV chamber	 <p>Look through the Atlantium Unit's view port and check if there is condensation on the inner side of the view port and/or if there is water collected between the quartz tube sleeve and the stainless steel underneath. if you see this, contact Atlantium support for further instructions.</p>
7	The UVT sensor has malfunctioned.	 <p>Switch between the UVT and UVIS sensors and see if the reading increased. If the reading is increased, switch the sensors back and replace the UVT sensor. See page See Replacing/Checking a UVT Analyzer or UVIS Sensor on page 129.</p>

11.11 UV Lamp ignition failed!

Event Index	Control Module displays this warning message
14	Lamp ignition failed Check if it needs to be replaced, or if there is a faulty connection or ballast malfunction.






For Ballast Module version C, check the Voltage value error code. See *The dose is above the maximum dose* on page 167.

	Possible Cause	Solution	
1	The system is set to the wrong model.	In the Control Module , access Technician screen #2 . Verify that the system is set to the correct model, number of lamps and branches. See Configuring the Technician Settings on page 64.	
2	One or more connectors are burnt out.		Turn off the system's main power source On each Connection Box, turn the switch to the Off position. Disconnect and thoroughly inspect the Ballast connectors. If replacement is needed, contact Atlantium Technical Support.
3	The power supply inside the Ballast Module is faulty.	 	In a system with more than one lamp, if possible, switch between the Ballast Module connectors in order to verify the Ballast is faulty, if so replace the Ballast Module. In a system with only one lamp, replace the Ballast Module with a new one. See Connecting the Cables to the Electrical Cabinet on page 61.
4	A lamp is faulty/burned out.	 	In a system with more than one lamp, switch between the lamps in order to verify the lamp is faulty, if so replace the lamp. In a system with only one lamp, replace the lamp with a new one. See Replacing a UV Lamp on page 129.
5	The ID number of the Connection Box card does not match ID number of the Ballast Module.		On each Connection Box, open the top cover and locate the 3-digit display (as shown on the right). Check that the set number is identical to the number marked on corresponding Ballast Module. If not identical, use the switch to change it to the correct number. 
6	One or more of the fuses in the Connection Box is burned out.		Replace the burned out fuse in the Connection Box. Contact Atlantium support for further instructions.
7	The Connection Box card is faulty.		On the Connection Box, open the top cover and check that the 3-digit display and LEDs are lit. If they are dark, replace the Connection Box card. Contact Atlantium support for further instructions.

11.13 Control Module power failure

Event Index	
39	The system turned off due to Control Module power failure.

	Possible Cause		Solution
1	No power is feeding into the Connection Box.		Open the Connection boxes and verify that all Connection Boxes have power. See Connection Box Connections Diagram provided.
2	A wire is loose.		With a small flat screwdriver go over all the communication screws in the Control Module and Connections Box s and make sure all wires are located properly in their place and are well tightened. Control Module Connections on page 56
3	A jumper is missing.		A communication jumper might need to be installed, contact Atlantium Support for further instruction.
4	Ground is not connected to the Control Module's power inlet.		A certified electrician is required to verify that the Control Module is properly grounded. Control Module Connections on page 56
5	There is a Hardware problem in the Control Module's I/O (ISO) or in the Connection Box.		Contact Atlantium support for further instructions.

11.14 The UV Lamp unexpectedly shut down

Event Index	Control Module displays this warning message
43	A lamp shutdown unexpectedly.



For Ballast Module version C, check the Voltage value error code. See *The dose is above the maximum dose* on page 167.

	Possible Cause	Solution
1	A short power failure (up to 15 seconds) to the Atlantium Unit only, while the Control Module still had power.	After 3 minutes, turn the lamps back on using the On/Off button on the Control Module's main screen.
2	Ballast, lamp, connection failure	Check for faulty connection, ballast or lamp.



This situation can happen only in installations were the **Control Module** and the Atlantium Unit have separate power sources.

11.15 CRC error

Event Index	Event
44	Cyclic Redundancy Check error. Check if the parameters and counters have been reset to factory defaults. If so, contact Atlantium Technical Support.




	Possible Cause	Solution
1	While writing parameters into the Control Module's flash storage, the system encountered a problem due to an unexpected power failure or software upgrade.	Reenter all system parameters from scratch. Contact Atlantium support for further instructions. See Configuring the General & Connection Settings on page 95.



For Ballast Module version C, check the Voltage value error code. See *The dose is above the maximum dose* on page 167.

11.16 Ballast Module communication error

Event Index	Control Module displays this warning message
46	There is lost communication between one of the Connection Boxes and the Control Module . The system is shutting down.
69	

	Possible Cause		Solution
1	No power is feeding into the BM.		that all Connection Boxes have power.
2	A wire is loose.		With a small flat screwdriver go over all the communication screws in the Control Module and the and make sure all wires are located properly in their place and are well tightened. Control Module Connections on page 56
3	A jumper is missing.		A communication jumper might need to be installed, contact Atlantium Support for further instruction.
34	Ground is not connected to the Control Module's power inlet.		A certified electrician is required to verify that the Control Module is properly grounded. Control Module Connections on page 56
45	There is a Hardware problem in the Control Module's I/O (ISO) or in the Connection Box.		Contact Atlantium support for further instructions.

11.17 Tuning process aborted by system

Event Index	Control Module displays this warning message
100	Tuning process aborted by system

	Possible Cause	Solution
1	Communications fault	<p>Check the communications cables and cable connections between the Control Module and other equipment.</p> <p>Restart the Control Module.</p> <p>If the problem persists, contact Atlantium Technical Support.</p>



Appendix A Modbus Communication Protocol

Modbus is an application layer messaging protocol for client/server communication between devices connected on different types of buses or networks.

Modbus is often used to connect a supervisory computer with a Remote Terminal Unit (RTU) in supervisory control and data acquisition systems.

For information on how to configure the communication properties, see **Modbus Communication Connections** on page 64.

➤ Physical connection to Modbus

Physical connection to Modbus shall be performed by a technician. Ask your Atlantium representative for details.

➤ To set Modbus connection parameters in Control Module:

Step 1. Set Modbus address to 1

Step 2. Set baud rate to 19200

The installation technician will set the IP address.

A.1 Modbus Registry Map

The table on the following pages provides the information you need to help you configure your network to properly communicate with the Atlantium system.

ATTENTION



- Modbus registers are meant to be used for specific commands in a command algorithm. Write only once to any register and await response.
- Registers 194-224 are 'Read' Only
- All of the registers have a length of Unsigned 16 bits, even the Coils Bits
- To read input from a register, use Function Code 4 (Read input registers)
- To write output to a register, use Function Code 6 (Write output single register).

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
0	Min Dose	:10		Up to 6553	mJ/cm ²	R
1	Max Dose	:1			mJ/cm ²	R
2	Set For	:10		Up to 6553	mJ/cm ²	R
3	System Unit format		Coil Bit	0 - Imperial, 1 - Metric		R

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
4	Flow in FS mode	: 1		Min. Val = 1 , Max.Val = 30000 - Display according to format set on HMI (m ³ /h or gal/min)	m ³ /h	R/W
5	Min Flow	: 100		Min. Val = 1 , Max.Val = 300 - Display according to format set on HMI (m ³ /h or gal/min)	m ³ /h	R/W
6	Max Flow	: 1		Min. Val = 1 , Max.Val = 30000 - Display according to format set on HMI (m ³ /h or gal/min)	m ³ /h	2.1.1-B43
7	Operation Mode		Coil Bit	0: Power Mode, 1: Dose Mode		R/W
8	System Lamps status	: 1		Average of all lamps status.	%	R
204	Dose	: 1		Actual dose	mJ/cm ²	R
205	System On/Off		Coil Bit	0 - System OFF, 1 - System ON		R/W
227	UVT	: 100		Actual UVT	%	R
228	Power	: 1		Actual power	%	R
229	Flow	: 1		Actual flow value - Display according to format set on HMI (m ³ /h)	m ³ /h	R
194	System Temperature	: 100			°C	R
32	Set Power	: 1		Set the power for power mode	%	R/W
Lamp1						
35	UVIS	: 100			4-20 mA	R
36	UVTS A	: 100			4-20 mA	R
37	UVTS B	: 100			4-20 mA	R

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
38	Lamp Current	: 100			Amper	R
39	Lamp Voltage	: 10			Voltage	R
40	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
42	Lamp UVT A	: 100			%	R
43	Lamp Status	: 100			%	R
44	Lamp UVT B	: 100			%	R
46	Lamp Age	: 1			Hour	R
47	Lamp Ignitions	: 1				R
51	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
52	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
53	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 2						
54	UVIS	: 100			4-20 mA	R
55	UVTS A	: 100			4-20 mA	R
56	UVTS B	: 100			4-20 mA	R
57	Lamp Current	: 100			Amper	R
58	Lamp Voltage	: 10			Voltage	R
59	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
61	Lamp UVT A	: 100			%	R
62	Lamp Status	: 100			%	R
63	Lamp UVT B	: 100			%	R
65	Lamp Age	: 1			Hour	R
66	Lamp Ignitions	: 1				R
70	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
71	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
72	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 3						
73	UVIS	: 100			4-20 mA	R
74	UVTS A	: 100			4-20 mA	R
75	UVTS B	: 100			4-20 mA	R
76	Lamp Current	: 100			Amper	R
77	Lamp Voltage	: 10			Voltage	R
78	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
80	Lamp UVT A	: 100			%	R
81	Lamp Status	: 100			%	R
82	Lamp UVT B	: 100			%	R
84	Lamp Age	: 1			Hour	R
85	Lamp Ignitions	: 1				R
89	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
90	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
91	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 4						
92	UVIS	: 100			4-20 mA	R
93	UVTS A	: 100			4-20 mA	R
94	UVTS B	: 100			4-20 mA	R
95	Lamp Current	: 100			Amper	R
96	Lamp Voltage	: 10			Voltage	R

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
97	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
99	Lamp UVT A	: 100			%	R
100	Lamp Status	: 100			%	R
101	Lamp UVT B	: 100			%	R
103	Lamp Age	: 1			Hour	R
104	Lamp Ignitions	: 1				R
108	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
109	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
110	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 5						
111	UVIS	: 100			4-20 mA	R
112	UVTS A	: 100			4-20 mA	R
113	UVTS B	: 100			4-20 mA	R
114	Lamp Current	: 100			Amper	R
115	Lamp Voltage	: 10			Voltage	R
116	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
118	Lamp UVT A	: 100			%	R
119	Lamp Status	: 100			%	R
120	Lamp UVT B	: 100			%	R
122	Lamp Age	: 1			Hour	R
123	Lamp Ignitions	: 1				R
127	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
128	Turn On/Off		Coil Bit	1 - Turn ON, 0 - Turn OFF		R/W

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
129	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 6						
130	UVIS	: 100			4-20 mA	R
131	UVTS A	: 100			4-20 mA	R
132	UVTS B	: 100			4-20 mA	R
133	Lamp Current	: 100			Amper	R
134	Lamp Voltage	: 10			Voltage	R
135	Lamp On		Coil Bit	1 - Lamp is ON, 0 - Lamp is OFF		R
137	Lamp UVT A	: 100			%	R
138	Lamp Status	: 100			%	R
139	Lamp UVT B	: 100			%	R
141	Lamp Age	: 1			Hour	R
142	Lamp Ignitions	: 1				R
146	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
147	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
148	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 7						
149	UVIS	: 100			4-20 mA	R
150	UVTS A	: 100			4-20 mA	R
151	UVTS B	: 100			4-20 mA	R
152	Lamp Current	: 100			Amper	R
153	Lamp Voltage	: 10			Voltage	R
154	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
156	Lamp UVT A	: 100			%	R
157	Lamp Status	: 100			%	R
158	Lamp UVT B	: 100			%	R
160	Lamp Age	: 1			Hour	R
161	Lamp Ignitions	: 1				R
165	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
166	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
167	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R
Lamp 8						
168	UVIS	: 100			4-20 mA	R
169	UVTS A	: 100			4-20 mA	R
170	UVTS B	: 100			4-20 mA	R
171	Lamp Current	: 100			Amper	R
172	Lamp Voltage	: 10			Voltage	R
173	Lamp On		Coil Bit	1 - Lamp is ON , 0 - Lamp is OFF		R
175	Lamp UVT A	: 100			%	R
176	Lamp Status	: 100			%	R
177	Lamp UVT B	: 100			%	R
179	Lamp Age	: 1			Hour	R
180	Lamp Ignitions	: 1				R
184	Lamp Enable		Coil Bit	0 - Disable, 1 - Enable		R/W
185	Turn On/Off		Coil Bit	1 - Turn ON , 0 - Turn OFF		R/W
186	Lamp state			0 -> lamp OFF 1 -> Lamp Ignition, 2 -> Lamp On		R

Table A-1: Modbus Registry Map (*) R = Read Only RW = Read/Write

Register address	Register name	Divide	Type	Comment	Units	Read/Write
Valve						
200	Bypass Valve		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
201	Inlet Valve		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
202	Outlet Valve/ Ready		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
Alarms						
203	General Alarm		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
206	Over dose		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
207	Min Dose #2		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
208	High Temp #4		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
209	Over Temp #5		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
210	Shut Down Alarm		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
211	Low UVT		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
212	Lost Comm		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
213	Under flow		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
214	High Flow #10		Coil Bit	1 - Valve ON , 0 - Valve OFF		R
224	Under dose set #41		Coil Bit	1 - Valve ON , 0 - Valve OFF		R



Appendix B System Messages

The table below details the message that can appear on the **Control Module's** screen or in the Event logs. A number of parameters are User Defined and include setting a value and upon reaching, exceeding or falling below it, an Action is set to be triggered. The Action is also configurable. The options are:

- **None** - The event is not considered an error, so no corrective action is taken. No warning message is issued.
- **Caution** - The caution alerts you to an anomaly based on the user preferences.
- **Warning** - One or more warning messages are issued and it triggers a pop-up window message and a General Alarm (if configured, see **Configuring the General Alarm** on page 73).
- **Shut-Down** - In case of a serious error or dangerous condition, the system shuts down and triggers a pop-up window message and a General Alarm (if configured, see **Configuring the General Alarm** on page 73).

The other parameters are system defined. The type column in the table below details the type of parameter.

Table B-1: **Control Module's** Messages

Key	Type	Event Log	Line Message/Popup Title	Popup Message
1	The value is User Defined	Over Max. Dose	The dose is above the maximum dose	The dose is above the maximum defined in the system settings.
2	The value is User Defined (The default is None)	Dose Too Low	The UV dose is too low	Dose too low! Below minimum!
4	Warning - The default temperature threshold is 5°C (9°F) below what is defined for Over Temp	Temp. Too High	Temperature is Too High	The lamp's temperature getting too high -- check water flow.
5	Shutdown - - The default temperature threshold is User Defined	Over Temp	Temperature is Critically High!	The lamp's temperature is too high and the unit will shut down.
6	Shutdown - Hardware malfunction	Temperature Sensor Fault	Temperature Sensor Fault	One of the temperature sensors has malfunctioned or the communication with the Connection Box card was lost.
9	Shutdown ---The Minimum Flow is User Defined	Low Flow	The rate of the water flow is too low	The water flow rate is lower than the minimum flow rate. Check the water flow.
10	The value is User Defined	High Flow	The rate of the water flow is too high	The water flow rate is higher than the maximum flow rate allowed. Check the water flow.
11	The value is User Defined	Transmission Low	UVT is too low!	UVT is below the required value
14	Warning	Lamp Ignition	UV Lamp Ignition Failed!	The UV lamp has failed to ignite due to an electronic fault. The UV lamp may be burnt out or a wire may be disconnected.
16	Appears in the Event Log only - pops up from additional info from Event Log	User On		The Control Module screen or an external signal turned on the system.

Table B-1: **Control Module's Messages**

Key	Type	Event Log	Line Message/Popup Title	Popup Message
17	Appears in the Event Log only - pops up from additional info from Event Log	User Off		The Control Module screen or an external signal shut down the system.
18	Appears in the Event Log only - pops up from additional info from Event Log	Auto On		System power was restored or flow raise above minimum. The lamps reignite.
19	Appears in the Event Log only - pops up from additional info from Event Log	Auto Off		Flow rate below user low flow setting; automatic shutdown.
20	Appears in the Event Log only - pops up from additional info from Event Log	Lamps On		System Ready. All the enabled lamps are on.
24	Caution	Dose On Spec	Dose On Spec	The UV dose being delivered by the system is above the minimum validated value
25	Warning	Dose Off Spec	Dose Off Spec	The UV dose being delivered by the system is below the minimum validated value
26	Caution	UVT On Spec	UVT On Spec	The UVT value is above the minimum validated UVT
27	Warning	UVT Off Spec	UVT Off Spec	The UVT value is below the minimum validated UVT
28	Caution	Flow On Spec	Flow On Spec	The flow rate is below the maximum validated flow
29	Warning	Flow Off Spec	Flow Off Spec	The flow rate is above the maximum validated flow
33	Warning	UVT 4th calibration failed	UVT Analyzer 4th calibration check failed	UVT Analyzer calibration check failed 4 times in a row. System is off-spec
34	The value is User Defined (Default as None)	Validated Min UVT	Validated Min UVT	UVT is below Validated Min UVT
35	The value is User Defined (Default as None)	Validated Max Flow	Validated Max Flow	Flow is above Validated Max Flow
39	Appears in the Event Log only - pops up from additional info from Event Log	Power Failure	Power Failure	The system was turned off due to power failure
41	The value is User Defined	UV Dose	The UV Dose is below the set level	The UV Dose is below the Operate At dose
42	Warning - Sensor needs to be replaced or there may be a loose wire	Temp. Sensor Fault	Temperature Sensor Fault	Fault on lamp temperature sensor
43	Shutdown	Lamp Shutdown	The UV lamp unexpectedly shutdown	Lamp shutdown

Table B-1: **Control Module's** Messages

Key	Type	Event Log	Line Message/Popup Title	Popup Message
44	Appears in the Event Log only - pops up from additional info from Event Log	CRC Error	CRC Error	System error parameters and counters might be reset to factory defaults. Please check
45	Shutdown	PS Fault	Power supply fault	Ballast fault [value displayed], error code: [number displayed].
46	Warning	Communication Error	Communication Error	Lost communication with the Ballast Module
49	Appears in the Event Log only - pops up from additional info from Event Log	UVIS calib info	UVIS calib info	UVIS calib lamp [value displayed]
50	Appears in the Event Log only - pops up from additional info from Event Log	UVT calib info	UVT calib info	UVT calib lamp [value displayed]
53	Appears in the Event Log only - pops up from additional info from Event Log	Settings Changed	Settings changed	Settings changed [value displayed]
54	Caution	UVIS is calibrated successfully	UVIS is calibrated successfully	UVIS is calibrated successfully
55	Caution	UVIS calibration failed	UVIS Calibration Failed	UVIS calibration failed, Sensor is out of calibration. Correction Factor is implemented
56	Caution	UVT successful calibration check	UVT successful calibration check	UVT Analyzer successful calibration check
57	Caution	UVT check failed	UVT Analyzer check failed	UVT Analyzer check failed; Auto recalibration was done



Table B-1: Atlantium System Parameters Checklist

Doc. No. PE12A000E - Rel. 008



Appendix C Glossary of Terms

Term	Definition
Auxiliaries	Valves, flow devices, etc. essential to the workings of the Atlantium system but not directly a part of the Atlantium system.
Ballast	The power supply that translates the electrical power to UV power.
Connection Box	The box that sits on top of each lamp unit and holds the circuit board for the Electrical Cabinet or Ballast Module electrical configurations. Not relevant for Ballast Module/Cable-style.
Control Module	Control Module that controls operations and dose measurement. Comes in two versions: Standard and Premium. The Standard has a monochromatic screen and several key features. The Premium has a color screen can accommodate a full complement of reporting and trending features.
External On/Off	This enables an external source (SCADA, PLC, Process) to turn the Atlantium system on and off.
IP56	Protected from limited dust ingress. Protected from high pressure water jets from any direction
<i>Electrical configuration styles: Atlantium provides a choice of electrical configurations.</i>	
Electrical Cabinet-style (EC)	EC - Electrical Cabinet.
Ballast Module	Waterproof case for the ballast which connects via a consolidated plug from the circuit board which sits on top of each lamp unit.
General Alarm	This enables the Atlantium unit to send an alarm to a buzzer, cell phone or other destination.
Inlet/Outlet Valves	Isolating Valves on the Inlet/outlet sides.
Lamp Chamber	The chamber which holds the lamp.
Lifting Support	The lifting element which can also be used to help support the Unit.
Pinhole	This is a small disc that is fitted for each sensor port to ensure that the right amount of light penetrates.
Portable CIP System	The portable unit Atlantium sells that connects to the Unit to clean and disinfect it without disassembling. It includes several kits – a valve kit, an accessories kit and the CIP kit itself.
Quartz Chamber	The quartz pipe in which the UV exposure occurs.
System Ready Signal	The signal the Atlantium unit provides to tell the production system that the Atlantium System is ready to supply properly treated water.
System Tuning	This is process is performed when key components are replaced or changed to synchronize them.

Term	Definition
Triangle Support Brackets	RZ-Series only- brackets that can be used to support and balance a unit.
Ultrasonic Cleaner	Ultrasonic cleaning system.
UV Intensity Sensor	The sensor that measures the UV intensity in the Lamp chamber and feeds the real time dose calculation.
UVT Analyzer	The sensor that measures the lamp UV intensity through the water. Together with the UV Intensity sensor and the Control Module, it analyzes, tracks and reports the water quality.



Appendix D Consumables & Spare Parts



The Part Numbers and Descriptions of the Consumables & Spare Parts shown in these tables are subject to change.

Table D-1: **RZ104** Consumables and Spares

Part Number	Description
Consumables - Required	
MP0023000	O-RING 2-327 V0680-70 FOR SLEEVE
OPE000400	UV LAMP 95mm 1kW
Recommended Spare parts AIO	
HSL010950	PT100 TEMPERATURE SENSOR, 1.1m
OPE004200	QUARTZ SLEEVE RZ104/RS104
OPB000100	UV SENSOR 10W/m2
SAE013300	LAMP CONNECTOR ASSY, RZ
PS0000240	BALLAST MODULE 1.0-2.3KW, 380-480V
AP0001200	TEMPERATURE CONVERTER CARD
AP0001300	LM CARD, RZ SYSTEMS
AP0001500	AC/DC MODULE, 100-240VAC TO 24VDC
SAM000800	WAVE GUIDE ASSY
PS0004000	POWER SUPPLY, AC/DC, 12V, 2.1A, 25.2W, HOLES

Table D-2:

ATTACHMENT 13

Updated Lab Analysis



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 28, 2024

Andy Slater
ChampionX LLC
PO Box 2167
Freeport, TX 77542

Work Order: **HS24011276**

Laboratory Results for: **2024 Permit Renewal-WK1**

Dear Andy Slater,

ALS Environmental received 3 sample(s) on Jan 24, 2024 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Andy C. Neir

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Work Order: HS24011276

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24011276-01	OF-001	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>
HS24011276-02	Field Duplicate	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>
HS24011276-03	Field Blank	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Work Order: HS24011276

CASE NARRATIVE

Work Order Comments

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.
Chlorine, Dissolved, Oxygen and Sulfite are immediate tests. Sample results are flagged with an "H" qualifier.
- The analyses for Mercury and Cyanide, Available were subcontracted to ALS Environmental in Holland, MI. Final report attached.
The analysis for Formaldehyde was subcontracted to A&B Laboratories in Houston, TX. The final report is attached.
The analyses for E.coli and Enterococci were subcontracted to Envirodyne Laboratories, Inc. in Houston, TX. Final report attached.
The analysis for Hexavalent Chromium was subcontracted to Eurofins Environmental Testing America I in Lancaster, PA . Final report attached

ECD Organics by Method E608**Batch ID: 206672****Sample ID: LCS-206672**

- The multi-response compounds toxaphene and chlordane were not included in the spiking solution for the LCS/LCSD.

Sample ID: MBLK-206672

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.

Sample ID: MBLK-206672 (1)

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.

GCMS Semivolatiles by Method E625**Batch ID: 206399**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method E624**Batch ID: R457279****Sample ID: CCV**

- Bromomethane and 2-Chloroethyl vinyl ether failed outside control limits high. Associated samples are ND.

Sample ID: VLCSW-240125

- Bromomethane failed outside control limits high. Associated samples are ND.

Sample ID: HS24010950-09MS

- MS/MSD was performed on an unrelated sample.

GCMS Volatiles by Method SW8260**Batch ID: R457278****Sample ID: HS24010950-09MS**

- MS and MSD are for an unrelated sample

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Work Order: HS24011276

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Metals by Method Calculation**Batch ID: R458288**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method E200.8**Batch ID: 206750****Sample ID: HS24011574-01MS/HS24011658-01MS**

- MS and MSD are for unrelated samples

Wet Chemistry by Method E300**Batch ID: R457117****Sample ID: HS24011022-01MS**

- MS/MSD was performed on an unrelated sample.

WetChemistry by Method E376.1**Batch ID: R457693**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540C**Batch ID: R457800**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E1664A**Batch ID: R457886**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4**Batch ID: R457930**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500H+ B**Batch ID: R458120**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B**Batch ID: R458262**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Work Order: HS24011276

CASE NARRATIVE

WetChemistry by Method SM4500SO3B**Batch ID: R458055**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500CL F**Batch ID: R457906**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500-O G**Batch ID: R457806**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540D**Batch ID: R457712**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B**Batch ID: R457552**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500CN EG**Batch ID: 206762**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 NH3-B-F**Batch ID: 206826**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2120B**Batch ID: R457275**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500P E**Batch ID: 207057**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500 NH3 D**Batch ID: 206737,R458277**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Work Order: HS24011276

CASE NARRATIVE

WetChemistry by Method SM5540C

Batch ID: 206495

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5210 B

Batch ID: 206463,206464

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624				Analyst: PC
1,1,1-Trichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1,2,2-Tetrachloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1,2-Trichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1-Dichloroethane	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
1,1-Dichloroethene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dibromoethane	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichlorobenzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichloropropane	U		0.700	5.00	ug/L	1	26-Jan-2024 07:53
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,4-Dichlorobenzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
2-Butanone	U		1.00	10.0	ug/L	1	26-Jan-2024 07:53
2-Chloroethyl vinyl ether	U		1.30	10.0	ug/L	1	26-Jan-2024 07:53
Acetonitrile	U	n	25.0	50.0	ug/L	1	26-Jan-2024 07:53
Acrolein	U		4.00	20.0	ug/L	1	26-Jan-2024 07:53
Acrylonitrile	U		4.00	10.0	ug/L	1	26-Jan-2024 07:53
Benzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Benzyl Chloride	U	n	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Bromodichloromethane	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Bromoform	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Bromomethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Carbon disulfide	U	n	0.900	10.0	ug/L	1	26-Jan-2024 07:53
Carbon tetrachloride	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Chlorobenzene	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
Chloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Chloroform	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Chloromethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
cis-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Dibromochloromethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Dibromomethane	U	n	0.600	5.00	ug/L	1	26-Jan-2024 07:53
Ethylbenzene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Hexachlorobutadiene	U	n	1.00	5.00	ug/L	1	26-Jan-2024 07:53
Methylene chloride	U		1.00	10.0	ug/L	1	26-Jan-2024 07:53
Styrene	U	n	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Tetrachloroethene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Toluene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
trans-1,2-Dichloroethene	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
trans-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Trichloroethene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Sample ID: OF-001
Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
Lab ID:HS24011276-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES		Method:E624					Analyst: PC
Vinyl acetate	U	n	1.90	10.0	ug/L	1	26-Jan-2024 07:53
Vinyl chloride	U		0.400	2.00	ug/L	1	26-Jan-2024 07:53
Xylenes, Total	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Total Trihalomethanes (TTHMs)	U	a	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Surr: 1,2-Dichloroethane-d4	74.4			70-126	%REC	1	26-Jan-2024 07:53
Surr: 4-Bromofluorobenzene	96.4			82-124	%REC	1	26-Jan-2024 07:53
Surr: Dibromofluoromethane	84.5			77-123	%REC	1	26-Jan-2024 07:53
Surr: Toluene-d8	104			82-127	%REC	1	26-Jan-2024 07:53
VOLATILES - SW8260C		Method:SW8260					Analyst: PC
Acetaldehyde	U	n	10	10	ug/L	1	26-Jan-2024 07:53
Propylene oxide	U	n	10	10	ug/L	1	26-Jan-2024 07:53
Surr: 1,2-Dichloroethane-d4	74.4			70-126	%REC	1	26-Jan-2024 07:53
Surr: 4-Bromofluorobenzene	96.4			82-124	%REC	1	26-Jan-2024 07:53
Surr: Dibromofluoromethane	84.5			77-123	%REC	1	26-Jan-2024 07:53
Surr: Toluene-d8	104			82-127	%REC	1	26-Jan-2024 07:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 24-Jan-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
1,2,4-Trichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
1,2-Dichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
1,2-Diphenylhydrazine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
1,4-Dichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4,5-Trichlorophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
2,4,6-Trichlorophenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dichlorophenol	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dimethylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dinitrophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dinitrotoluene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2,6-Dichlorophenol	U	n	0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,6-Dinitrotoluene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2-Chloronaphthalene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
2-Chlorophenol	U		1.00	5.00	ug/L	1	29-Jan-2024 22:23
2-Methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2-Nitrophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
3&4-Methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
3,3'-Dichlorobenzidine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
4,6-Dinitro-2-methylphenol	U		0.900	5.00	ug/L	1	29-Jan-2024 22:23
4-Bromophenyl phenyl ether	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
4-Chloro-3-methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
4-Chlorophenyl phenyl ether	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
4-Nitrophenol	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Acenaphthene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Acenaphthylene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Anthracene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benz(a)anthracene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benzidine	U		5.00	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(a)pyrene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(b)fluoranthene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(g,h,i)perylene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(k)fluoranthene	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroethoxy)methane	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroethyl)ether	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroisopropyl)ether	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-ethylhexyl)phthalate	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Butyl benzyl phthalate	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 24-Jan-2024		Analyst: GEY	
Chrysene	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Di-n-butyl phthalate	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Di-n-octyl phthalate	U		2.00	5.00	ug/L	1	29-Jan-2024 22:23
Dibenz(a,h)anthracene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Diethyl phthalate	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Dimethyl phthalate	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Fluoranthene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Fluorene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorobenzene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorobutadiene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorocyclopentadiene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Hexachloroethane	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Indeno(1,2,3-cd)pyrene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Isophorone	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitroso-di-n-butylamine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodi-n-propylamine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodiethylamine	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodimethylamine	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodiphenylamine	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Naphthalene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Nitrobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Nonylphenol	U	n	5.00	5.00	ug/L	1	29-Jan-2024 22:23
Pentachlorobenzene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Pentachlorophenol	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Phenanthrene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Phenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Pyrene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Pyridine	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Cresols, Total	U	n	0.400	5.00	ug/L	1	29-Jan-2024 22:23
Surr: 2,4,6-Tribromophenol	82.6			42-124	%REC	1	29-Jan-2024 22:23
Surr: 2-Fluorobiphenyl	67.1			48-120	%REC	1	29-Jan-2024 22:23
Surr: 2-Fluorophenol	51.0			20-120	%REC	1	29-Jan-2024 22:23
Surr: 4-Terphenyl-d14	76.1			51-135	%REC	1	29-Jan-2024 22:23
Surr: Nitrobenzene-d5	62.4			41-120	%REC	1	29-Jan-2024 22:23
Surr: Phenol-d6	62.4			20-120	%REC	1	29-Jan-2024 22:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 30-Jan-2024		Analyst: JBA	
4,4'-DDD	U		0.0000760	0.00250	ug/L	1	01-Feb-2024 23:49
4,4'-DDE	0.000366	J	0.000100	0.00250	ug/L	1	01-Feb-2024 23:49
4,4'-DDT	0.000488	J	0.000145	0.00250	ug/L	1	01-Feb-2024 23:49
Aldrin	U		0.0000340	0.00125	ug/L	1	01-Feb-2024 23:49
alpha-BHC	U		0.00125	0.00125	ug/L	1	01-Feb-2024 23:49
Aroclor 1016	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1221	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1232	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1242	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1248	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1254	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1260	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
beta-BHC	0.000130	J	0.0000430	0.00125	ug/L	1	01-Feb-2024 23:49
Chlordane	U		0.0250	0.0250	ug/L	1	01-Feb-2024 23:49
delta-BHC	U		0.0000290	0.00125	ug/L	1	01-Feb-2024 23:49
Dieldrin	0.000199	J	0.0000530	0.00250	ug/L	1	01-Feb-2024 23:49
Endosulfan I	U		0.0000390	0.00125	ug/L	1	01-Feb-2024 23:49
Endosulfan II	U		0.00250	0.00250	ug/L	1	01-Feb-2024 23:49
Endosulfan sulfate	U		0.0000930	0.00250	ug/L	1	01-Feb-2024 23:49
Endrin	U		0.0000830	0.00250	ug/L	1	01-Feb-2024 23:49
Endrin aldehyde	U		0.000147	0.00250	ug/L	1	01-Feb-2024 23:49
gamma-BHC	U		0.00125	0.00125	ug/L	1	01-Feb-2024 23:49
Heptachlor	U		0.0000450	0.00125	ug/L	1	01-Feb-2024 23:49
Heptachlor epoxide	U		0.0000270	0.00125	ug/L	1	01-Feb-2024 23:49
Toxaphene	U		0.0250	0.0250	ug/L	1	01-Feb-2024 23:49
Total PCBs	U	n	0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
<i>Surr: Decachlorobiphenyl</i>	86.6			61-154	%REC	1	01-Feb-2024 23:49
<i>Surr: Decachlorobiphenyl</i>	106			61-154	%REC	1	01-Feb-2024 16:38
<i>Surr: Tetrachloro-m-xylene</i>	78.5			60-144	%REC	1	01-Feb-2024 23:49
<i>Surr: Tetrachloro-m-xylene</i>	79.0			60-144	%REC	1	01-Feb-2024 16:38
TRIVALENT CHROMIUM		Method:Calculation		Analyst: JHD			
Chromium, Trivalent	0.00100	Jn	0.000251	0.00400	mg/L	1	07-Feb-2024 16:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 31-Jan-2024		Analyst: MSC	
Aluminum	0.239		0.000800	0.0100	mg/L	1	01-Feb-2024 22:10
Antimony	U		0.000530	0.00500	mg/L	1	01-Feb-2024 22:10
Arsenic	0.00154	J	0.000250	0.00200	mg/L	1	01-Feb-2024 22:10
Barium	0.0435		0.0000840	0.00400	mg/L	1	01-Feb-2024 22:10
Beryllium	U		0.0000910	0.00500	mg/L	1	01-Feb-2024 22:10
Cadmium	0.0000810	J	0.0000770	0.00200	mg/L	1	01-Feb-2024 22:10
Chromium	0.00127	J	0.000251	0.00400	mg/L	1	01-Feb-2024 22:10
Copper	0.00452		0.000170	0.00200	mg/L	1	01-Feb-2024 22:10
Lead	0.0376		0.000120	0.00200	mg/L	1	01-Feb-2024 22:10
Nickel	0.00284		0.000110	0.00200	mg/L	1	01-Feb-2024 22:10
Selenium	U		0.000860	0.00200	mg/L	1	01-Feb-2024 22:10
Silver	0.0000710	J	0.0000440	0.00200	mg/L	1	01-Feb-2024 22:10
Thallium	U		0.000250	0.00200	mg/L	1	01-Feb-2024 22:10
Zinc	0.0257		0.00100	0.00400	mg/L	1	01-Feb-2024 22:10
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	2.61		0.610	2.00	mg/L	1	02-Feb-2024 07:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	0.363		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Chloride	8.97		0.200	0.500	mg/L	1	24-Jan-2024 20:53
Fluoride	U		0.0500	0.100	mg/L	1	24-Jan-2024 20:53
Nitrogen, Nitrate (As N)	0.300		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Nitrogen, Nitrite (As N)	U		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Sulfate	7.24		0.200	0.500	mg/L	1	24-Jan-2024 20:53
Nitrate/Nitrite (as N)	0.300		0.0300	0.200	mg/L	1	24-Jan-2024 20:53
SULFIDE BY E376.1		Method:E376.1				Analyst: CD	
Sulfide	U		1.70	2.00	mg/L	1	31-Jan-2024 15:13
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	22.0		5.00	15.0	mg/L	1	02-Feb-2024 16:30
TOTAL DISSOLVED SOLIDS BY SM2540C-2011		Method:M2540C				Analyst: JAC	
Total Dissolved Solids (Residue, Filterable)	96.0		5.00	10.0	mg/L	1	31-Jan-2024 13:00
TOTAL SUSPENDED SOLIDS BY SM2540D-2011		Method:M2540D				Analyst: JAC	
Suspended Solids (Residue, Non-Filterable)	10.2		2.00	2.00	mg/L	1	31-Jan-2024 11:00
ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011		Method:M4500 NH3 D				Analyst: MZD	
Nitrogen, Organic	U		0.50	0.50	mg/L	1	07-Feb-2024 15:50
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011		Method:M4500 NH3 D		Prep:M4500-N C / 30-Jan-2024		Analyst: MZD	
Nitrogen, Total Kjeldahl	4.9		0.10	0.50	mg/L	1	31-Jan-2024 10:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CYANIDE BY SM 4500CN E&G-2011		Method:M4500CN EG		Prep:M4500CN E&G / 31-Jan-2024		Analyst: MZD	
Cyanide	0.00200	J	0.00200	0.00500	mg/L	1	01-Feb-2024 12:12
DISSOLVED OXYGEN BY SM4500-O G		Method:M4500-O G				Analyst: DW	
Oxygen, Dissolved	6.43	H	1.00	1.00	mg/L	1	01-Feb-2024 14:45
COLOR BY SM 2120B - 2011		Method:SM2120B				Analyst: JAC	
Color, Apparent	75.0		25.0	25.0	Color Units	5	26-Jan-2024 09:30
ALKALINITY BY -2011		Method:SM2320B				Analyst: DW	
Alkalinity, Total (As CaCO3)	37.8		2.50	5.00	mg/L	1	07-Feb-2024 13:16
AMMONIA AS N BY SM4500 NH3-B-F-2011		Method:SM4500 NH3-B-F		Prep:M4500-NH3 B / 01-Feb-2024		Analyst: JAC	
Nitrogen, Ammonia (as N)	5.7		0.62	1.2	mg/L	1	02-Feb-2024 11:08
RESIDUAL CHLORINE BY SM4500CL F-2011		Method:SM4500CL F				Analyst: MC	
Chlorine	U	H	0.10	0.10	mg/L	1	02-Feb-2024 13:35
PH BY SM4500H+ B-2011		Method:SM4500H+ B				Analyst: DW	
pH	6.80	H	0.100	0.100	pH Units	1	06-Feb-2024 13:40
Temp Deg C @pH	12.8	H	0	0	°C	1	06-Feb-2024 13:40
PHOSPHORUS BY SM4500P E-2011		Method:SM4500P E		Prep:SM4500P E / 07-Feb-2024		Analyst: MZD	
Phosphorus, Total (As P)	0.0340	J	0.0200	0.0500	mg/L	1	07-Feb-2024 14:13
SULFITE BY SM4500SO3B		Method:SM4500SO3B				Analyst: MC	
Sulfite	U	H	5.00	5.00	mg/L	1	05-Feb-2024 16:36
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011		Method:SM5210 B		Prep:SM5210 B / 25-Jan-2024		Analyst: DW	
Biochemical Oxygen Demand	2.79		2.00	2.00	mg/L	1	30-Jan-2024 15:31
CBOD BY SM5210B-2011		Method:SM5210 B		Prep:SM5210 B / 25-Jan-2024		Analyst: DW	
Carbonaceous Biochemical Oxygen Demand	2.28		2.00	2.00	mg/L	1	30-Jan-2024 16:53
TOTAL ORGANIC CARBON - SM5310B-2011		Method:SM5310B				Analyst: DW	
Organic Carbon, Total	8.19		0.500	1.00	mg/L	1	30-Jan-2024 04:06
SURFACTANTS (MBAS) BY SM5540C		Method:SM5540C		Prep:SM5540C / 26-Jan-2024		Analyst: MZD	
MBAS	0.0880		0.00800	0.0500	mg/L 340 MW LAS	1	26-Jan-2024 09:30
SUBCONTRACT HEXAVALENT CHROMIUM		Method:E218.6				Analyst: SUB	
Chromium, Hexavalent	See Attached		0		UG/L	1	31-Jan-2024 15:03
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667		Method:NA				Analyst: SUBHO	
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45
SUBCONTRACT ANALYSIS - E. COLI		Method:NA				Analyst: EDL	
Subcontract Analysis	See Attached		0			1	29-Jan-2024 12:46
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA				Analyst: EDL	
Subcontract Analysis	See Attached		0			1	29-Jan-2024 12:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	OF-001	Lab ID:HS24011276-01
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0			1	31-Jan-2024 10:21
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA				Analyst: SUBHO	
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	Field Duplicate	Lab ID:HS24011276-02
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	Field Blank	Lab ID:HS24011276-03
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

Batch ID: 206399	Start Date: 24 Jan 2024 09:00	End Date: 24 Jan 2024 09:00
Method: 625 AQ SEP FUNNEL EXTRACTION	Prep Code: 625PRF	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Sodium thiosulfate

Batch ID: 206463	Start Date: 25 Jan 2024 12:15	End Date: 25 Jan 2024 12:15
Method: WETCHEMPREP, BOD	Prep Code: BOD_PR 5210B	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206464	Start Date: 25 Jan 2024 15:30	End Date: 25 Jan 2024 15:30
Method: CBOD PREP	Prep Code: CBOD_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206495	Start Date: 26 Jan 2024 08:30	End Date: 26 Jan 2024 08:30
Method: MBAS - PREPARATION	Prep Code: MBAS_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		400 (mL)	400 (mL)	1	1-L plastic, Neat

Batch ID: 206672	Start Date: 30 Jan 2024 11:42	End Date: 30 Jan 2024 11:42
Method: AQPREP SEP FUNNEL: PEST/PCB	Prep Code: 608_W_LOWPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Neat

Batch ID: 206737	Start Date: 30 Jan 2024 12:00	End Date: 30 Jan 2024 12:00
Method: TKN WATER - PREP	Prep Code: TKN_W_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		25 (mL)	50 (mL)	2	1-liter amber glass, H2SO4 to pH <2

Batch ID: 206750	Start Date: 31 Jan 2024 14:00	End Date: 31 Jan 2024 14:00
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994	Prep Code: 200.8PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 206762	Start Date: 31 Jan 2024 09:00	End Date: 31 Jan 2024 09:00
Method: CYANIDE PREP - SM4500CN-2011	Prep Code: CN_TW4500_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		50 (mL)	50 (mL)	1	250 mL plastic, NaOH/ASE

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

Batch ID: 206826	Start Date: 01 Feb 2024 09:00	End Date: 01 Feb 2024 09:00
Method: NITROGEN AMMONIA - WATER - PREP	Prep Code: NIT_AMM_W_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		1 (mL)	25 (mL)	25	500 mL plastic, H2SO4 to pH <2

Batch ID: 207057	Start Date: 07 Feb 2024 11:00	End Date: 07 Feb 2024 11:00
Method: PHOSPHOROUS	Prep Code: P_TW_PR4500	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011276-01		50 (mL)	50 (mL)	1	500 mL plastic, H2SO4 to pH <2

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 206399 (1)		Test Name : SEMIVOLATILE			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		24 Jan 2024 09:00	29 Jan 2024 22:23	1
Batch ID: 206463 (0)		Test Name : BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		25 Jan 2024 12:15	30 Jan 2024 15:31	1
Batch ID: 206464 (0)		Test Name : CBOD BY SM5210B-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		25 Jan 2024 15:30	30 Jan 2024 16:53	1
Batch ID: 206495 (0)		Test Name : SURFACTANTS (MBAS) BY SM5540C			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		26 Jan 2024 08:30	26 Jan 2024 09:30	1
Batch ID: 206672 (0)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		30 Jan 2024 11:42	01 Feb 2024 23:49	1
Batch ID: 206672 (1)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		30 Jan 2024 11:42	01 Feb 2024 16:38	1
Batch ID: 206737 (0)		Test Name : TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		30 Jan 2024 12:00	31 Jan 2024 10:20	1
Batch ID: 206750 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		31 Jan 2024 14:00	01 Feb 2024 22:10	1
Batch ID: 206762 (0)		Test Name : CYANIDE BY SM 4500CN E&G-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		31 Jan 2024 09:00	01 Feb 2024 12:12	1
Batch ID: 206826 (0)		Test Name : AMMONIA AS N BY SM4500 NH3-B-F-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		01 Feb 2024 09:00	02 Feb 2024 11:08	1
Batch ID: 207057 (0)		Test Name : PHOSPHORUS BY SM4500P E-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08		07 Feb 2024 11:00	07 Feb 2024 14:13	1
Batch ID: R457117 (0)		Test Name : ANIONS BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			24 Jan 2024 20:53	1
Batch ID: R457275 (0)		Test Name : COLOR BY SM 2120B - 2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			26 Jan 2024 09:30	5
Batch ID: R457278 (0)		Test Name : VOLATILES - SW8260C			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			26 Jan 2024 07:53	1
Batch ID: R457279 (0)		Test Name : VOLATILES			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			26 Jan 2024 07:53	1
Batch ID: R457402 (0)		Test Name : SUBCONTRACT ANALYSIS - ENTEROCOCCI			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			29 Jan 2024 12:46	1
HS24011276-01	OF-001	24 Jan 2024 10:08			29 Jan 2024 12:46	1
Batch ID: R457552 (0)		Test Name : TOTAL ORGANIC CARBON - SM5310B-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			30 Jan 2024 04:06	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R457605 (0)		Test Name : SUBCONTRACT ANALYSIS - FORMALDEHYDE			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			31 Jan 2024 10:21	1
Batch ID: R457690 (0)		Test Name : SUBCONTRACT HEXAVALENT CHROMIUM			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			31 Jan 2024 15:03	1
Batch ID: R457693 (0)		Test Name : SULFIDE BY E376.1			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			31 Jan 2024 15:13	1
Batch ID: R457712 (0)		Test Name : TOTAL SUSPENDED SOLIDS BY SM 2540D-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			31 Jan 2024 11:00	1
Batch ID: R457800 (0)		Test Name : TOTAL DISSOLVED SOLIDS BY SM2540C-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			31 Jan 2024 13:00	1
Batch ID: R457806 (0)		Test Name : DISSOLVED OXYGEN BY SM4500-O G			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			01 Feb 2024 14:45	1
Batch ID: R457886 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			02 Feb 2024 07:00	1
Batch ID: R457906 (0)		Test Name : RESIDUAL CHLORINE BY SM4500CL F-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			02 Feb 2024 13:35	1
Batch ID: R457930 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			02 Feb 2024 16:30	1
Batch ID: R458055 (0)		Test Name : SULFITE BY SM4500SO3B			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			05 Feb 2024 16:36	1
Batch ID: R458120 (0)		Test Name : PH BY SM4500H+ B-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			06 Feb 2024 13:40	1
Batch ID: R458218 (0)		Test Name : SUBCONTRACT ANALYSIS - MERCURY LOW			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			07 Feb 2024 11:45	1
HS24011276-01	OF-001	24 Jan 2024 10:08			07 Feb 2024 11:45	1
HS24011276-02	Field Duplicate	24 Jan 2024 10:08			07 Feb 2024 11:45	1
HS24011276-03	Field Blank	24 Jan 2024 10:08			07 Feb 2024 11:45	1
Batch ID: R458262 (0)		Test Name : ALKALINITY BY -2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			07 Feb 2024 13:16	1
Batch ID: R458277 (0)		Test Name : ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			07 Feb 2024 15:50	1
Batch ID: R458288 (0)		Test Name : TRIVALENT CHROMIUM			Matrix: Water	
HS24011276-01	OF-001	24 Jan 2024 10:08			07 Feb 2024 16:28	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608						
MBLK	Sample ID: MBLK-206672	Units: UG/L		Analysis Date: 01-Feb-2024 22:46						
Client ID:	Run ID: ECD_11_457851		SeqNo: 7810283		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4'-DDD	U	0.00250								
4,4'-DDE	U	0.00250								
4,4'-DDT	U	0.00250								
Aldrin	U	0.00125								
alpha-BHC	U	0.00125								
beta-BHC	U	0.00125								
Chlordane	U	0.0250								
delta-BHC	U	0.00125								
Dieldrin	U	0.00250								
Endosulfan I	U	0.00125								
Endosulfan II	U	0.00250								
Endosulfan sulfate	U	0.00250								
Endrin	U	0.00250								
Endrin aldehyde	U	0.00250								
gamma-BHC	U	0.00125								
Heptachlor	U	0.00125								
Heptachlor epoxide	U	0.00125								
Toxaphene	U	0.0250								
Surr: Decachlorobiphenyl	0.0198	0	0.02	0	99.0	61 - 154				
Surr: Tetrachloro-m-xylene	0.02037	0	0.02	0	102	60 - 144				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608					
LCS		Sample ID: LCS-206672		Units: UG/L		Analysis Date: 01-Feb-2024 22:04			
Client ID:		Run ID: ECD_11_457851		SeqNo: 7810281		PrepDate: 30-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.03965	0.00250	0.05	0	79.3	53 - 144			
4,4'-DDE	0.03827	0.00250	0.05	0	76.5	55 - 144			
4,4'-DDT	0.03341	0.00250	0.05	0	66.8	53 - 149			
Aldrin	0.01768	0.00125	0.025	0	70.7	47 - 141			
alpha-BHC	0.01846	0.00125	0.025	0	73.9	51 - 141			
beta-BHC	0.01896	0.00125	0.025	0	75.8	58 - 144			
delta-BHC	0.01806	0.00125	0.025	0	72.2	48 - 146			
Dieldrin	0.03887	0.00250	0.05	0	77.7	56 - 144			
Endosulfan I	0.01757	0.00125	0.025	0	70.3	55 - 141			
Endosulfan II	0.03489	0.00250	0.05	0	69.8	57 - 144			
Endosulfan sulfate	0.0377	0.00250	0.05	0	75.4	58 - 145			
Endrin	0.03233	0.00250	0.05	0	64.7	60 - 163			
Endrin aldehyde	0.04166	0.00250	0.05	0	83.3	59 - 158			
gamma-BHC	0.01914	0.00125	0.025	0	76.6	53 - 142			
Heptachlor	0.01819	0.00125	0.025	0	72.8	51 - 144			
Heptachlor epoxide	0.01823	0.00125	0.025	0	72.9	55 - 142			
Surr: Decachlorobiphenyl	0.01451	0	0.02	0	72.6	61 - 154			
Surr: Tetrachloro-m-xylene	0.01476	0	0.02	0	73.8	60 - 144			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608					
LCSD		Sample ID: LCSD-206672		Units: UG/L		Analysis Date: 01-Feb-2024 22:25			
Client ID:		Run ID: ECD_11_457851		SeqNo: 7810282		PrepDate: 30-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.04157	0.00250	0.05	0	83.1	53 - 144	0.03965	4.73	20
4,4'-DDE	0.04018	0.00250	0.05	0	80.4	55 - 144	0.03827	4.88	20
4,4'-DDT	0.03506	0.00250	0.05	0	70.1	53 - 149	0.03341	4.81	20
Aldrin	0.01852	0.00125	0.025	0	74.1	47 - 141	0.01768	4.64	20
alpha-BHC	0.01954	0.00125	0.025	0	78.2	51 - 141	0.01846	5.67	20
beta-BHC	0.01986	0.00125	0.025	0	79.4	58 - 144	0.01896	4.65	20
delta-BHC	0.0191	0.00125	0.025	0	76.4	48 - 146	0.01806	5.58	20
Dieldrin	0.04072	0.00250	0.05	0	81.4	56 - 144	0.03887	4.66	20
Endosulfan I	0.01839	0.00125	0.025	0	73.6	55 - 141	0.01757	4.58	20
Endosulfan II	0.03709	0.00250	0.05	0	74.2	57 - 144	0.03489	6.11	20
Endosulfan sulfate	0.03992	0.00250	0.05	0	79.8	58 - 145	0.0377	5.71	20
Endrin	0.03551	0.00250	0.05	0	71.0	60 - 163	0.03233	9.39	20
Endrin aldehyde	0.04346	0.00250	0.05	0	86.9	59 - 158	0.04166	4.23	20
gamma-BHC	0.02037	0.00125	0.025	0	81.5	53 - 142	0.01914	6.25	20
Heptachlor	0.01928	0.00125	0.025	0	77.1	51 - 144	0.01819	5.82	20
Heptachlor epoxide	0.01917	0.00125	0.025	0	76.7	55 - 142	0.01823	5.03	20
Surr: Decachlorobiphenyl	0.01516	0	0.02	0	75.8	61 - 154	0.01451	4.4	20
Surr: Tetrachloro-m-xylene	0.01542	0	0.02	0	77.1	60 - 144	0.01476	4.39	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206672 (1)		Instrument: ECD_7		Method: CHLORINATED PEST/PCBS BY E608					
MBLK	Sample ID: MBLK-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:04					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810945		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	U	0.0200							
Aroclor 1221	U	0.0200							
Aroclor 1232	U	0.0200							
Aroclor 1242	U	0.0200							
Aroclor 1248	U	0.0200							
Aroclor 1254	U	0.0200							
Aroclor 1260	U	0.0200							
Total PCBs	U	0.0125							
Surr: Decachlorobiphenyl	0.0204	0	0.02	0	102	61 - 154			
Surr: Tetrachloro-m-xylene	0.01955	0	0.02	0	97.8	60 - 144			

LCS	Sample ID: LCS1-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:16					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810946		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4131	0.0200	0.5	0	82.6	54 - 138			
Aroclor 1260	0.4206	0.0200	0.5	0	84.1	57 - 136			
Surr: Decachlorobiphenyl	0.01836	0	0.02	0	91.8	61 - 154			
Surr: Tetrachloro-m-xylene	0.0184	0	0.02	0	92.0	60 - 144			

LCSD	Sample ID: LCSD1-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:29					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810947		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4673	0.0200	0.5	0	93.5	54 - 138	0.4131	12.3	20
Aroclor 1260	0.4681	0.0200	0.5	0	93.6	57 - 136	0.4206	10.7	20
Surr: Decachlorobiphenyl	0.01936	0	0.02	0	96.8	61 - 154	0.01836	5.31	20
Surr: Tetrachloro-m-xylene	0.02044	0	0.02	0	102	60 - 144	0.0184	10.5	20

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: 206750 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-206750	Units: ug/L		Analysis Date: 01-Feb-2024 20:38					
Client ID:		Run ID: ICPMS07_457821		SeqNo: 7810063		PrepDate: 31-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	1.56	10.0							J
Antimony	U	5.00							
Arsenic	U	2.00							
Barium	0.209	4.00							J
Beryllium	U	5.00							
Cadmium	U	2.00							
Chromium	U	4.00							
Copper	U	2.00							
Lead	U	2.00							
Nickel	0.199	2.00							J
Selenium	U	2.00							
Silver	U	2.00							
Thallium	U	2.00							
Zinc	1.005	4.00							J

LCS	Sample ID: LCS-206750	Units: ug/L		Analysis Date: 01-Feb-2024 20:41					
Client ID:		Run ID: ICPMS07_457821		SeqNo: 7810064		PrepDate: 31-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	111.8	10.0	100	0	112	85 - 115			
Antimony	47.48	5.00	50	0	95.0	85 - 115			
Arsenic	51.59	2.00	50	0	103	85 - 115			
Barium	50.21	4.00	50	0	100	85 - 115			
Beryllium	49.08	5.00	50	0	98.2	85 - 115			
Cadmium	50.94	2.00	50	0	102	85 - 115			
Chromium	47.3	4.00	50	0	94.6	85 - 115			
Copper	49.41	2.00	50	0	98.8	85 - 115			
Lead	48.99	2.00	50	0	98.0	85 - 115			
Nickel	51.98	2.00	50	0	104	85 - 115			
Selenium	52.6	2.00	50	0	105	85 - 115			
Silver	53.2	2.00	50	0	106	85 - 115			
Thallium	47.95	2.00	50	0	95.9	85 - 115			
Zinc	53.77	4.00	50	0	108	85 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206750 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS		Sample ID: HS24011658-01MS		Units: ug/L		Analysis Date: 01-Feb-2024 21:22			
Client ID:		Run ID: ICPMS07_457821		SeqNo: 7810078		PrepDate: 31-Jan-2024		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	294.1	100	100	146.8	147	70 - 130			S
Antimony	44.55	50.0	50	0	89.1	70 - 130			J
Arsenic	57.04	20.0	50	2.881	108	70 - 130			
Barium	87.4	40.0	50	29.69	115	70 - 130			
Beryllium	58.71	50.0	50	0	117	70 - 130			
Cadmium	51.97	20.0	50	0	104	70 - 130			
Chromium	55.62	40.0	50	9.113	93.0	70 - 130			
Copper	64.83	20.0	50	20.59	88.5	70 - 130			
Lead	52.08	20.0	50	2.749	98.7	70 - 130			
Nickel	50.98	20.0	50	0	102	70 - 130			
Selenium	58.08	20.0	50	0	116	70 - 130			
Silver	47.86	20.0	50	0	95.7	70 - 130			
Thallium	53.18	20.0	50	0	106	70 - 130			
Zinc	78.72	40.0	50	36.25	84.9	70 - 130			

MS		Sample ID: HS24011574-01MS		Units: ug/L		Analysis Date: 01-Feb-2024 20:45			
Client ID:		Run ID: ICPMS07_457821		SeqNo: 7810066		PrepDate: 31-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	550.8	10.0	200	223.8	164	70 - 130			S
Antimony	55.67	5.00	50	11.3	88.7	70 - 130			
Arsenic	50.54	2.00	50	1.545	98.0	70 - 130			
Barium	141.1	4.00	50	88.51	105	70 - 130			
Beryllium	48.67	5.00	50	0	97.3	70 - 130			
Cadmium	48.76	2.00	50	0.215	97.1	70 - 130			
Chromium	49.5	4.00	50	5.106	88.8	70 - 130			
Copper	130.5	2.00	50	69.25	122	70 - 130			
Lead	79.42	2.00	50	25.77	107	70 - 130			
Nickel	57.32	2.00	50	8.281	98.1	70 - 130			
Selenium	48.48	2.00	50	0	97.0	70 - 130			
Silver	49.29	2.00	50	0.044	98.5	70 - 130			
Thallium	48.7	2.00	50	0.346	96.7	70 - 130			
Zinc	232	4.00	50	154	156	70 - 130			S

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: 206750 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MSD	Sample ID: HS24011658-01MSD		Units: ug/L		Analysis Date: 01-Feb-2024 21:29				
Client ID:	Run ID: ICPMS07_457821		SeqNo: 7810081		PrepDate: 31-Jan-2024		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	247.2	100	100	146.8	100	70 - 130	294.1	17.3	20
Antimony	45.21	50.0	50	0	90.4	70 - 130	44.55	0	20 J
Arsenic	57.41	20.0	50	2.881	109	70 - 130	57.04	0.647	20
Barium	80.29	40.0	50	29.69	101	70 - 130	87.4	8.47	20
Beryllium	53.81	50.0	50	0	108	70 - 130	58.71	8.71	20
Cadmium	53.73	20.0	50	0	107	70 - 130	51.97	3.34	20
Chromium	56.69	40.0	50	9.113	95.2	70 - 130	55.62	1.91	20
Copper	65.39	20.0	50	20.59	89.6	70 - 130	64.83	0.859	20
Lead	49.13	20.0	50	2.749	92.8	70 - 130	52.08	5.82	20
Nickel	50.71	20.0	50	0	101	70 - 130	50.98	0.515	20
Selenium	56.86	20.0	50	0	114	70 - 130	58.08	2.13	20
Silver	47.35	20.0	50	0	94.7	70 - 130	47.86	1.08	20
Thallium	47.08	20.0	50	0	94.2	70 - 130	53.18	12.2	20
Zinc	79.76	40.0	50	36.25	87.0	70 - 130	78.72	1.31	20

MSD	Sample ID: HS24011574-01MSD		Units: ug/L		Analysis Date: 01-Feb-2024 20:48				
Client ID:	Run ID: ICPMS07_457821		SeqNo: 7810067		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	529.7	10.0	200	223.8	153	70 - 130	550.8	3.91	20 S
Antimony	50.87	5.00	50	11.3	79.2	70 - 130	55.67	9	20
Arsenic	45.01	2.00	50	1.545	86.9	70 - 130	50.54	11.6	20
Barium	131.2	4.00	50	88.51	85.3	70 - 130	141.1	7.32	20
Beryllium	43.1	5.00	50	0	86.2	70 - 130	48.67	12.1	20
Cadmium	43.18	2.00	50	0.215	85.9	70 - 130	48.76	12.1	20
Chromium	44.08	4.00	50	5.106	77.9	70 - 130	49.5	11.6	20
Copper	124	2.00	50	69.25	109	70 - 130	130.5	5.1	20
Lead	72.1	2.00	50	25.77	92.7	70 - 130	79.42	9.65	20
Nickel	51.31	2.00	50	8.281	86.1	70 - 130	57.32	11.1	20
Selenium	43.41	2.00	50	0	86.8	70 - 130	48.48	11	20
Silver	41.24	2.00	50	0.044	82.4	70 - 130	49.29	17.8	20
Thallium	42.99	2.00	50	0.346	85.3	70 - 130	48.7	12.5	20
Zinc	202.9	4.00	50	154	97.8	70 - 130	232	13.4	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE						
MBLK	Sample ID: MBLK-206399	Units: ug/L		Analysis Date: 25-Jan-2024 13:55						
Client ID:	Run ID: SV-4_457212		SeqNo: 7806810		PrepDate: 24-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4,5-Tetrachlorobenzene	U	5.00								
1,2,4-Trichlorobenzene	U	5.00								
1,2-Dichlorobenzene	U	5.00								
1,2-Diphenylhydrazine	U	5.00								
1,3-Dichlorobenzene	U	5.00								
1,4-Dichlorobenzene	U	5.00								
2,4,5-Trichlorophenol	U	5.00								
2,4,6-Trichlorophenol	U	5.00								
2,4-Dichlorophenol	U	5.00								
2,4-Dimethylphenol	U	5.00								
2,4-Dinitrophenol	U	5.00								
2,4-Dinitrotoluene	U	5.00								
2,6-Dichlorophenol	U	5.00								
2,6-Dinitrotoluene	U	5.00								
2-Chloronaphthalene	U	5.00								
2-Chlorophenol	U	5.00								
2-Methylphenol	U	5.00								
2-Nitrophenol	U	5.00								
3&4-Methylphenol	U	5.00								
3,3'-Dichlorobenzidine	U	5.00								
4,6-Dinitro-2-methylphenol	U	5.00								
4-Bromophenyl phenyl ether	U	5.00								
4-Chloro-3-methylphenol	U	5.00								
4-Chlorophenyl phenyl ether	U	5.00								
4-Nitrophenol	U	5.00								
Acenaphthene	U	5.00								
Acenaphthylene	U	5.00								
Anthracene	U	5.00								
Benz(a)anthracene	U	5.00								
Benzidine	U	5.00								
Benzo(a)pyrene	U	5.00								
Benzo(b)fluoranthene	U	5.00								
Benzo(g,h,i)perylene	U	5.00								
Benzo(k)fluoranthene	U	5.00								

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-206399	Units: ug/L		Analysis Date: 25-Jan-2024 13:55					
Client ID:	Run ID: SV-4_457212	SeqNo: 7806810		PrepDate: 24-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	U	5.00							
Bis(2-chloroethyl)ether	U	5.00							
Bis(2-chloroisopropyl)ether	U	5.00							
Bis(2-ethylhexyl)phthalate	U	5.00							
Butyl benzyl phthalate	U	5.00							
Chrysene	U	5.00							
Dibenz(a,h)anthracene	U	5.00							
Diethyl phthalate	U	5.00							
Dimethyl phthalate	U	5.00							
Di-n-butyl phthalate	U	5.00							
Di-n-octyl phthalate	U	5.00							
Fluoranthene	U	5.00							
Fluorene	U	5.00							
Hexachlorobenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Hexachlorocyclopentadiene	U	5.00							
Hexachloroethane	U	5.00							
Indeno(1,2,3-cd)pyrene	U	5.00							
Isophorone	U	5.00							
Naphthalene	U	5.00							
Nitrobenzene	U	5.00							
N-Nitrosodiethylamine	U	5.00							
N-Nitrosodimethylamine	U	5.00							
N-Nitroso-di-n-butylamine	U	5.00							
N-Nitrosodi-n-propylamine	U	5.00							
N-Nitrosodiphenylamine	U	5.00							
Nonylphenol	U	5.00							
Pentachlorobenzene	U	5.00							
Pentachlorophenol	U	5.00							
Phenanthrene	U	5.00							
Phenol	U	5.00							
Pyrene	U	5.00							
Pyridine	U	5.00							
Cresols, Total	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE						
MBLK	Sample ID: MBLK-206399	Units: ug/L		Analysis Date: 25-Jan-2024 13:55						
Client ID:	Run ID: SV-4_457212		SeqNo: 7806810		PrepDate: 24-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2,4,6-Tribromophenol	62.42	5.00	100	0	62.4	42 - 124				
Surr: 2-Fluorobiphenyl	62.9	5.00	100	0	62.9	48 - 120				
Surr: 2-Fluorophenol	47.59	5.00	100	0	47.6	20 - 120				
Surr: 4-Terphenyl-d14	61.46	5.00	100	0	61.5	51 - 135				
Surr: Nitrobenzene-d5	58.99	5.00	100	0	59.0	41 - 120				
Surr: Phenol-d6	51.21	5.00	100	0	51.2	20 - 120				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-206399		Units: ug/L		Analysis Date: 25-Jan-2024 14:15			
Client ID:		Run ID: SV-4_457212		SeqNo: 7806811		PrepDate: 24-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	70.53	5.00	100	0	70.5	49 - 120			
1,2,4-Trichlorobenzene	75.5	5.00	100	0	75.5	54 - 118			
1,2-Dichlorobenzene	66.68	5.00	100	0	66.7	49 - 115			
1,2-Diphenylhydrazine	82.52	5.00	100	0	82.5	57 - 134			
1,3-Dichlorobenzene	68.73	5.00	100	0	68.7	56 - 115			
1,4-Dichlorobenzene	66.08	5.00	100	0	66.1	56 - 115			
2,4,5-Trichlorophenol	78.17	5.00	100	0	78.2	52 - 115			
2,4,6-Trichlorophenol	78.33	5.00	100	0	78.3	56 - 115			
2,4-Dichlorophenol	72.38	5.00	100	0	72.4	53 - 115			
2,4-Dimethylphenol	70.87	5.00	100	0	70.9	53 - 115			
2,4-Dinitrophenol	79.01	5.00	100	0	79.0	47 - 115			
2,4-Dinitrotoluene	75.23	5.00	100	0	75.2	56 - 115			
2,6-Dichlorophenol	77.68	5.00	100	0	77.7	41 - 124			
2,6-Dinitrotoluene	77.63	5.00	100	0	77.6	57 - 115			
2-Chloronaphthalene	90.59	5.00	100	0	90.6	65 - 125			
2-Chlorophenol	64.99	5.00	100	0	65.0	54 - 115			
2-Methylphenol	61.36	5.00	100	0	61.4	53 - 115			
2-Nitrophenol	67.22	5.00	100	0	67.2	53 - 115			
3&4-Methylphenol	87.42	5.00	100	0	87.4	48 - 115			
3,3'-Dichlorobenzidine	76.63	5.00	100	0	76.6	25 - 115			
4,6-Dinitro-2-methylphenol	72.67	5.00	100	0	72.7	51 - 121			
4-Bromophenyl phenyl ether	74.97	5.00	100	0	75.0	49 - 115			
4-Chloro-3-methylphenol	73.12	5.00	100	0	73.1	51 - 115			
4-Chlorophenyl phenyl ether	69.9	5.00	100	0	69.9	56 - 115			
4-Nitrophenol	61.83	5.00	100	0	61.8	26 - 133			
Acenaphthene	72.76	5.00	100	0	72.8	57 - 115			
Acenaphthylene	70.88	5.00	100	0	70.9	57 - 118			
Anthracene	75.33	5.00	100	0	75.3	65 - 115			
Benz(a)anthracene	75.85	5.00	100	0	75.8	53 - 115			
Benzidine	12.72	5.00	100	0	12.7	10 - 115			
Benzo(a)pyrene	75.78	5.00	100	0	75.8	57 - 115			
Benzo(b)fluoranthene	77.84	5.00	100	0	77.8	54 - 117			
Benzo(g,h,i)perylene	74	5.00	100	0	74.0	56 - 115			
Benzo(k)fluoranthene	73.41	5.00	100	0	73.4	50 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-206399		Units: ug/L		Analysis Date: 25-Jan-2024 14:15			
Client ID:		Run ID: SV-4_457212		SeqNo: 7806811		PrepDate: 24-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	87.87	5.00	100	0	87.9	54 - 115			
Bis(2-chloroethyl)ether	75.95	5.00	100	0	75.9	56 - 115			
Bis(2-chloroisopropyl)ether	71.44	5.00	100	0	71.4	48 - 115			
Bis(2-ethylhexyl)phthalate	72.82	5.00	100	0	72.8	50 - 115			
Butyl benzyl phthalate	75.32	5.00	100	0	75.3	51 - 115			
Chrysene	73.17	5.00	100	0	73.2	52 - 120			
Dibenz(a,h)anthracene	73.7	5.00	100	0	73.7	56 - 115			
Diethyl phthalate	74.23	5.00	100	0	74.2	57 - 115			
Dimethyl phthalate	75.27	5.00	100	0	75.3	56 - 115			
Di-n-butyl phthalate	75.59	5.00	100	0	75.6	54 - 115			
Di-n-octyl phthalate	76.92	5.00	100	0	76.9	49 - 115			
Fluoranthene	78.79	5.00	100	0	78.8	58 - 115			
Fluorene	70.47	5.00	100	0	70.5	56 - 115			
Hexachlorobenzene	77.87	5.00	100	0	77.9	54 - 115			
Hexachlorobutadiene	80.18	5.00	100	0	80.2	51 - 115			
Hexachlorocyclopentadiene	85.55	5.00	100	0	85.5	48 - 115			
Hexachloroethane	71.28	5.00	100	0	71.3	54 - 115			
Indeno(1,2,3-cd)pyrene	74.15	5.00	100	0	74.1	51 - 115			
Isophorone	69.8	5.00	100	0	69.8	55 - 115			
Naphthalene	70.4	5.00	100	0	70.4	55 - 115			
Nitrobenzene	70.33	5.00	100	0	70.3	40 - 124			
N-Nitrosodiethylamine	30.54	5.00	50	0	61.1	40 - 130			
N-Nitrosodimethylamine	64.5	5.00	100	0	64.5	42 - 115			
N-Nitroso-di-n-butylamine	32.12	5.00	50	0	64.2	40 - 130			
N-Nitrosodi-n-propylamine	64.63	5.00	100	0	64.6	55 - 119			
N-Nitrosodiphenylamine	73.98	5.00	100	0	74.0	52 - 115			
Pentachlorobenzene	71.99	5.00	100	0	72.0	50 - 117			
Pentachlorophenol	78.17	5.00	100	0	78.2	45 - 125			
Phenanthrene	73.87	5.00	100	0	73.9	57 - 115			
Phenol	61.87	5.00	100	0	61.9	38 - 115			
Pyrene	74.23	5.00	100	0	74.2	54 - 119			
Pyridine	52.75	5.00	100	0	52.8	34 - 115			
Cresols, Total	148.8	5.00	200	0	74.4	48 - 115			
Surr: 2,4,6-Tribromophenol	67.5	5.00	100	0	67.5	42 - 124			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS	Sample ID: LCS-206399	Units: ug/L		Analysis Date: 25-Jan-2024 14:15					
Client ID:	Run ID: SV-4_457212		SeqNo: 7806811		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: 2-Fluorobiphenyl	68.59	5.00	100	0	68.6	48 - 120			
Surr: 2-Fluorophenol	57.29	5.00	100	0	57.3	20 - 120			
Surr: 4-Terphenyl-d14	63.18	5.00	100	0	63.2	51 - 135			
Surr: Nitrobenzene-d5	64.53	5.00	100	0	64.5	41 - 120			
Surr: Phenol-d6	56.9	5.00	100	0	56.9	20 - 120			

LCS	Sample ID: LCS1-206399	Units: ug/L		Analysis Date: 29-Jan-2024 15:44					
Client ID:	Run ID: SV-4_457548		SeqNo: 7806814		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Nonylphenol	30.01	5.00	50	0	60.0	40 - 140			
Surr: 2,4,6-Tribromophenol	68.01	5.00	100	0	68.0	42 - 124			
Surr: 2-Fluorobiphenyl	69.39	5.00	100	0	69.4	48 - 120			
Surr: 2-Fluorophenol	53.41	5.00	100	0	53.4	20 - 120			
Surr: 4-Terphenyl-d14	71.53	5.00	100	0	71.5	51 - 135			
Surr: Nitrobenzene-d5	63.01	5.00	100	0	63.0	41 - 120			
Surr: Phenol-d6	54.24	5.00	100	0	54.2	20 - 120			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206399		Units: ug/L		Analysis Date: 25-Jan-2024 14:36				
Client ID:		Run ID: SV-4_457212		SeqNo: 7806812		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4,5-Tetrachlorobenzene	68.2	5.00	100	0	68.2	49 - 120	70.53	3.36	20	
1,2,4-Trichlorobenzene	74.56	5.00	100	0	74.6	54 - 118	75.5	1.26	20	
1,2-Dichlorobenzene	68.25	5.00	100	0	68.2	49 - 115	66.68	2.33	20	
1,2-Diphenylhydrazine	83.31	5.00	100	0	83.3	57 - 134	82.52	0.943	20	
1,3-Dichlorobenzene	67.81	5.00	100	0	67.8	56 - 115	68.73	1.36	20	
1,4-Dichlorobenzene	67.18	5.00	100	0	67.2	56 - 115	66.08	1.66	20	
2,4,5-Trichlorophenol	75.11	5.00	100	0	75.1	52 - 115	78.17	3.99	20	
2,4,6-Trichlorophenol	78.08	5.00	100	0	78.1	56 - 115	78.33	0.315	20	
2,4-Dichlorophenol	72.54	5.00	100	0	72.5	53 - 115	72.38	0.218	20	
2,4-Dimethylphenol	71.31	5.00	100	0	71.3	53 - 115	70.87	0.622	20	
2,4-Dinitrophenol	79.89	5.00	100	0	79.9	47 - 115	79.01	1.11	20	
2,4-Dinitrotoluene	74.22	5.00	100	0	74.2	56 - 115	75.23	1.35	20	
2,6-Dichlorophenol	77.65	5.00	100	0	77.6	41 - 124	77.68	0.0502	20	
2,6-Dinitrotoluene	80.33	5.00	100	0	80.3	57 - 115	77.63	3.42	20	
2-Chloronaphthalene	101.6	5.00	100	0	102	65 - 125	90.59	11.4	20	
2-Chlorophenol	68.71	5.00	100	0	68.7	54 - 115	64.99	5.56	20	
2-Methylphenol	65.64	5.00	100	0	65.6	53 - 115	61.36	6.74	20	
2-Nitrophenol	66.99	5.00	100	0	67.0	53 - 115	67.22	0.345	20	
3&4-Methylphenol	93.03	5.00	100	0	93.0	48 - 115	87.42	6.22	20	
3,3'-Dichlorobenzidine	77.24	5.00	100	0	77.2	25 - 115	76.63	0.789	20	
4,6-Dinitro-2-methylphenol	71.89	5.00	100	0	71.9	51 - 121	72.67	1.08	20	
4-Bromophenyl phenyl ether	74.8	5.00	100	0	74.8	49 - 115	74.97	0.232	20	
4-Chloro-3-methylphenol	72.35	5.00	100	0	72.3	51 - 115	73.12	1.05	20	
4-Chlorophenyl phenyl ether	69.48	5.00	100	0	69.5	56 - 115	69.9	0.61	20	
4-Nitrophenol	72.13	5.00	100	0	72.1	26 - 133	61.83	15.4	20	
Acenaphthene	71.33	5.00	100	0	71.3	57 - 115	72.76	1.98	20	
Acenaphthylene	68.87	5.00	100	0	68.9	57 - 118	70.88	2.88	20	
Anthracene	75.07	5.00	100	0	75.1	65 - 115	75.33	0.351	20	
Benz(a)anthracene	75.84	5.00	100	0	75.8	53 - 115	75.85	0.00944	20	
Benzidine	12.01	5.00	100	0	12.0	10 - 115	12.72	5.71	20	
Benzo(a)pyrene	75.38	5.00	100	0	75.4	57 - 115	75.78	0.529	20	
Benzo(b)fluoranthene	83.13	5.00	100	0	83.1	54 - 117	77.84	6.58	20	
Benzo(g,h,i)perylene	74.06	5.00	100	0	74.1	56 - 115	74	0.077	20	
Benzo(k)fluoranthene	66.5	5.00	100	0	66.5	50 - 115	73.41	9.89	20	

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206399		Units: ug/L		Analysis Date: 25-Jan-2024 14:36				
Client ID:		Run ID: SV-4_457212		SeqNo: 7806812		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	89.48	5.00	100	0	89.5	54 - 115	87.87	1.82	20	
Bis(2-chloroethyl)ether	87.91	5.00	100	0	87.9	56 - 115	75.95	14.6	20	
Bis(2-chloroisopropyl)ether	76.97	5.00	100	0	77.0	48 - 115	71.44	7.44	20	
Bis(2-ethylhexyl)phthalate	73.04	5.00	100	0	73.0	50 - 115	72.82	0.303	20	
Butyl benzyl phthalate	75.45	5.00	100	0	75.5	51 - 115	75.32	0.175	20	
Chrysene	68.73	5.00	100	0	68.7	52 - 120	73.17	6.26	20	
Dibenz(a,h)anthracene	74.37	5.00	100	0	74.4	56 - 115	73.7	0.903	20	
Diethyl phthalate	74.14	5.00	100	0	74.1	57 - 115	74.23	0.117	20	
Dimethyl phthalate	73.9	5.00	100	0	73.9	56 - 115	75.27	1.84	20	
Di-n-butyl phthalate	76.03	5.00	100	0	76.0	54 - 115	75.59	0.59	20	
Di-n-octyl phthalate	75.96	5.00	100	0	76.0	49 - 115	76.92	1.26	20	
Fluoranthene	79.21	5.00	100	0	79.2	58 - 115	78.79	0.53	20	
Fluorene	69.25	5.00	100	0	69.3	56 - 115	70.47	1.75	20	
Hexachlorobenzene	78.5	5.00	100	0	78.5	54 - 115	77.87	0.799	20	
Hexachlorobutadiene	78.33	5.00	100	0	78.3	51 - 115	80.18	2.33	20	
Hexachlorocyclopentadiene	80.97	5.00	100	0	81.0	48 - 115	85.55	5.5	20	
Hexachloroethane	72.72	5.00	100	0	72.7	54 - 115	71.28	1.99	20	
Indeno(1,2,3-cd)pyrene	74.47	5.00	100	0	74.5	51 - 115	74.15	0.435	20	
Isophorone	71.26	5.00	100	0	71.3	55 - 115	69.8	2.07	20	
Naphthalene	70.82	5.00	100	0	70.8	55 - 115	70.4	0.595	20	
Nitrobenzene	70.78	5.00	100	0	70.8	40 - 124	70.33	0.643	20	
N-Nitrosodiethylamine	31.43	5.00	50	0	62.9	40 - 130	30.54	2.86	20	
N-Nitrosodimethylamine	62.2	5.00	100	0	62.2	42 - 115	64.5	3.63	20	
N-Nitroso-di-n-butylamine	32.86	5.00	50	0	65.7	40 - 130	32.12	2.28	20	
N-Nitrosodi-n-propylamine	70.5	5.00	100	0	70.5	55 - 119	64.63	8.69	20	
N-Nitrosodiphenylamine	74.9	5.00	100	0	74.9	52 - 115	73.98	1.23	20	
Pentachlorobenzene	71.25	5.00	100	0	71.3	50 - 117	71.99	1.04	20	
Pentachlorophenol	77.29	5.00	100	0	77.3	45 - 125	78.17	1.13	20	
Phenanthrene	74.26	5.00	100	0	74.3	57 - 115	73.87	0.515	20	
Phenol	71.81	5.00	100	0	71.8	38 - 115	61.87	14.9	20	
Pyrene	74.7	5.00	100	0	74.7	54 - 119	74.23	0.626	20	
Pyridine	48.59	5.00	100	0	48.6	34 - 115	52.75	8.22	20	
Cresols, Total	158.7	5.00	200	0	79.3	48 - 115	148.8	6.44	20	
Surr: 2,4,6-Tribromophenol	65.66	5.00	100	0	65.7	42 - 124	67.5	2.77	20	

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206399 (1)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206399		Units: ug/L		Analysis Date: 25-Jan-2024 14:36				
Client ID:		Run ID: SV-4_457212		SeqNo: 7806812		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorobiphenyl	68.26	5.00	100	0	68.3	48 - 120	68.59	0.481	20	
Surr: 2-Fluorophenol	58.33	5.00	100	0	58.3	20 - 120	57.29	1.81	20	
Surr: 4-Terphenyl-d14	63.39	5.00	100	0	63.4	51 - 135	63.18	0.323	20	
Surr: Nitrobenzene-d5	63.86	5.00	100	0	63.9	41 - 120	64.53	1.04	20	
Surr: Phenol-d6	62.17	5.00	100	0	62.2	20 - 120	56.9	8.85	20	

LCSD		Sample ID: LCSD1-206399		Units: ug/L		Analysis Date: 29-Jan-2024 16:26				
Client ID:		Run ID: SV-4_457548		SeqNo: 7806815		PrepDate: 24-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	28.89	5.00	50	0	57.8	40 - 140	30.01	3.8	20	
Surr: 2,4,6-Tribromophenol	71.36	5.00	100	0	71.4	42 - 124	68.01	4.8	20	
Surr: 2-Fluorobiphenyl	67.08	5.00	100	0	67.1	48 - 120	69.39	3.39	20	
Surr: 2-Fluorophenol	51.4	5.00	100	0	51.4	20 - 120	53.41	3.84	20	
Surr: 4-Terphenyl-d14	72.59	5.00	100	0	72.6	51 - 135	71.53	1.47	20	
Surr: Nitrobenzene-d5	62.52	5.00	100	0	62.5	41 - 120	63.01	0.787	20	
Surr: Phenol-d6	55.29	5.00	100	0	55.3	20 - 120	54.24	1.92	20	

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457278 (0)		Instrument: VOA9		Method: VOLATILES - SW8260C					
MBLK	Sample ID: VBLKW-240125	Units: ug/L		Analysis Date: 25-Jan-2024 23:41					
Client ID:	Run ID: VOA9_457278	SeqNo: 7808116		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	U	10							
Propylene oxide	U	10							
Surr: 1,2-Dichloroethane-d4	38.99	0	50	0	78.0	70 - 130			
Surr: 4-Bromofluorobenzene	48.3	0	50	0	96.6	82 - 115			
Surr: Dibromofluoromethane	42.83	0	50	0	85.7	73 - 126			
Surr: Toluene-d8	52.5	0	50	0	105	81 - 120			

LCS	Sample ID: VLCSW-240125	Units: ug/L		Analysis Date: 25-Jan-2024 22:56					
Client ID:	Run ID: VOA9_457278	SeqNo: 7808115		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	69.12	10	100	0	69.1	60 - 140			
Surr: 1,2-Dichloroethane-d4	46.46	0	50	0	92.9	70 - 130			
Surr: 4-Bromofluorobenzene	50.04	0	50	0	100	82 - 115			
Surr: Dibromofluoromethane	52.76	0	50	0	106	73 - 126			
Surr: Toluene-d8	52.87	0	50	0	106	81 - 120			

MS	Sample ID: HS24010950-09MS	Units: ug/L		Analysis Date: 26-Jan-2024 00:48					
Client ID:	Run ID: VOA9_457278	SeqNo: 7808118		PrepDate:		DF: 250			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	14060	2500	25000	0	56.2	60 - 140			S
Surr: 1,2-Dichloroethane-d4	9043	0	12500	0	72.3	70 - 126			
Surr: 4-Bromofluorobenzene	13000	0	12500	0	104	82 - 124			
Surr: Dibromofluoromethane	10740	0	12500	0	85.9	77 - 123			
Surr: Toluene-d8	13070	0	12500	0	105	82 - 127			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457278 (0)		Instrument: VOA9		Method: VOLATILES - SW8260C							
MSD	Sample ID: HS24010950-09MSD		Units: ug/L		Analysis Date: 26-Jan-2024 01:10						
Client ID:	Run ID: VOA9_457278		SeqNo: 7808119		PrepDate:		DF: 250				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acetaldehyde	14950	2500	25000	0	59.8	60 - 140	14060	6.15	20	S	
Surr: 1,2-Dichloroethane-d4	9145	0	12500	0	73.2	70 - 126	9043	1.12	20		
Surr: 4-Bromofluorobenzene	12950	0	12500	0	104	82 - 124	13000	0.439	20		
Surr: Dibromofluoromethane	10330	0	12500	0	82.7	77 - 123	10740	3.82	20		
Surr: Toluene-d8	13210	0	12500	0	106	82 - 127	13070	1.04	20		
The following samples were analyzed in this batch: HS24011276-01											

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240125	Units: ug/L		Analysis Date: 25-Jan-2024 23:41					
Client ID:	Run ID: VOA9_457279	SeqNo: 7808163		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	U	5.00							
1,1,2,2-Tetrachloroethane	U	5.00							
1,1,2-Trichloroethane	U	5.00							
1,1-Dichloroethane	U	5.00							
1,1-Dichloroethene	U	5.00							
1,2-Dibromoethane	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Dichloroethane	U	5.00							
1,2-Dichloropropane	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2-Butanone	U	10.0							
2-Chloroethyl vinyl ether	U	10.0							
Acetonitrile	U	50.0							
Acrolein	U	20.0							
Acrylonitrile	U	10.0							
Benzene	U	5.00							
Benzyl Chloride	U	5.00							
Bromodichloromethane	U	5.00							
Bromoform	U	5.00							
Bromomethane	U	5.00							
Carbon disulfide	U	10.0							
Carbon tetrachloride	U	5.00							
Chlorobenzene	U	5.00							
Chloroethane	U	5.00							
Chloroform	U	5.00							
Chloromethane	U	5.00							
cis-1,3-Dichloropropene	U	5.00							
Dibromochloromethane	U	5.00							
Dibromomethane	U	5.00							
Ethylbenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Methylene chloride	U	10.0							
Styrene	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240125	Units: ug/L		Analysis Date: 25-Jan-2024 23:41					
Client ID:	Run ID: VOA9_457279		SeqNo: 7808163		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	U	5.00							
Toluene	U	5.00							
trans-1,2-Dichloroethene	U	5.00							
trans-1,3-Dichloropropene	U	5.00							
Trichloroethene	U	5.00							
Vinyl acetate	U	10.0							
Vinyl chloride	U	2.00							
Xylenes, Total	U	5.00							
Total Trihalomethanes (TTHMs)	U	5.00							
Surr: 1,2-Dichloroethane-d4	38.99	5.00	50	0	78.0	70 - 126			
Surr: 4-Bromofluorobenzene	48.3	5.00	50	0	96.6	82 - 124			
Surr: Dibromofluoromethane	42.83	5.00	50	0	85.7	77 - 123			
Surr: Toluene-d8	52.5	5.00	50	0	105	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES						
LCS		Sample ID: VLCSW-240125		Units: ug/L		Analysis Date: 25-Jan-2024 22:56				
Client ID:		Run ID: VOA9_457279		SeqNo: 7808162		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	19.83	5.00	20	0	99.1	70 - 130				
1,1,2,2-Tetrachloroethane	19.16	5.00	20	0	95.8	70 - 120				
1,1,2-Trichloroethane	20.14	5.00	20	0	101	77 - 113				
1,1-Dichloroethane	17.9	5.00	20	0	89.5	71 - 122				
1,1-Dichloroethene	22.06	5.00	20	0	110	70 - 130				
1,2-Dibromoethane	20.15	5.00	20	0	101	76 - 123				
1,2-Dichlorobenzene	19.5	5.00	20	0	97.5	77 - 113				
1,2-Dichloroethane	18.61	5.00	20	0	93.0	70 - 124				
1,2-Dichloropropane	18.49	5.00	20	0	92.5	72 - 119				
1,3-Dichlorobenzene	19.39	5.00	20	0	97.0	78 - 118				
1,4-Dichlorobenzene	19.61	5.00	20	0	98.1	79 - 113				
2-Butanone	30.51	10.0	40	0	76.3	70 - 130				
2-Chloroethyl vinyl ether	45.36	10.0	40	0	113	60 - 135				
Acetonitrile	171.7	50.0	200	0	85.9	70 - 130				
Acrolein	32.87	20.0	40	0	82.2	70 - 130				
Acrylonitrile	35.33	10.0	40	0	88.3	70 - 130				
Benzene	19.47	5.00	20	0	97.4	74 - 120				
Benzyl Chloride	14.04	5.00	20	0	70.2	70 - 130				
Bromodichloromethane	19.54	5.00	20	0	97.7	74 - 122				
Bromoform	19.98	5.00	20	0	99.9	73 - 128				
Bromomethane	30.59	5.00	20	0	153	70 - 130				S
Carbon disulfide	42.68	10.0	40	0	107	70 - 130				
Carbon tetrachloride	21.02	5.00	20	0	105	71 - 125				
Chlorobenzene	20.23	5.00	20	0	101	76 - 113				
Chloroethane	22.3	5.00	20	0	111	70 - 130				
Chloroform	18.98	5.00	20	0	94.9	71 - 121				
Chloromethane	18.16	5.00	20	0	90.8	70 - 129				
cis-1,3-Dichloropropene	18.43	5.00	20	0	92.2	73 - 127				
Dibromochloromethane	20.55	5.00	20	0	103	77 - 122				
Dibromomethane	19.18	5.00	20	0	95.9	78 - 121				
Ethylbenzene	19.97	5.00	20	0	99.8	77 - 117				
Hexachlorobutadiene	21.16	5.00	20	0	106	70 - 130				
Methylene chloride	21.49	10.0	20	0	107	70 - 127				
Styrene	21.32	5.00	20	0	107	72 - 126				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES					
LCS		Sample ID: VLCSW-240125		Units: ug/L		Analysis Date: 25-Jan-2024 22:56			
Client ID:		Run ID: VOA9_457279		SeqNo: 7808162		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	23.04	5.00	20	0	115	76 - 119			
Toluene	20.81	5.00	20	0	104	77 - 118			
trans-1,2-Dichloroethene	21.14	5.00	20	0	106	72 - 127			
trans-1,3-Dichloropropene	17.65	5.00	20	0	88.3	77 - 119			
Trichloroethene	21.38	5.00	20	0	107	79 - 120			
Vinyl acetate	34.69	10.0	40	0	86.7	70 - 130			
Vinyl chloride	21.62	2.00	20	0	108	70 - 130			
Xylenes, Total	63.27	5.00	60	0	105	75 - 122			
Total Trihalomethanes (TTHMs)	79.04	5.00	80	0	98.8	65 - 135			
Surr: 1,2-Dichloroethane-d4	46.46	5.00	50	0	92.9	70 - 130			
Surr: 4-Bromofluorobenzene	50.04	5.00	50	0	100	83 - 122			
Surr: Dibromofluoromethane	52.76	5.00	50	0	106	73 - 126			
Surr: Toluene-d8	52.87	5.00	50	0	106	81 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES					
MS		Sample ID: HS24010950-09MS		Units: ug/L		Analysis Date: 26-Jan-2024 00:48			
Client ID:		Run ID: VOA9_457279		SeqNo: 7808165		PrepDate:		DF: 250	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	4559	1250	5000	0	91.2	70 - 130			
1,1,2,2-Tetrachloroethane	4657	1250	5000	0	93.1	70 - 123			
1,1,2-Trichloroethane	5045	1250	5000	0	101	70 - 117			
1,1-Dichloroethane	4231	1250	5000	0	84.6	70 - 127			
1,1-Dichloroethene	5230	1250	5000	0	105	70 - 130			
1,2-Dibromoethane	5196	1250	5000	0	104	70 - 124			
1,2-Dichlorobenzene	4901	1250	5000	0	98.0	70 - 115			
1,2-Dichloroethane	4493	1250	5000	0	89.9	70 - 127			
1,2-Dichloropropane	4441	1250	5000	0	88.8	70 - 122			
1,3-Dichlorobenzene	5045	1250	5000	0	101	70 - 119			
1,4-Dichlorobenzene	5041	1250	5000	0	101	70 - 114			
2-Butanone	6304	2500	10000	0	63.0	70 - 130			S
2-Chloroethyl vinyl ether	U	2500	10000	0	0	65 - 135			S
Acetonitrile	48340	12500	50000	0	96.7	70 - 130			
Acrolein	5467	5000	10000	0	54.7	70 - 130			S
Acrylonitrile	8497	2500	10000	0	85.0	70 - 130			
Benzene	4914	1250	5000	0	98.3	70 - 127			
Benzyl Chloride	3243	1250	5000	0	64.9	70 - 130			S
Bromodichloromethane	4777	1250	5000	0	95.5	70 - 124			
Bromoform	5007	1250	5000	0	100	70 - 129			
Bromomethane	5994	1250	5000	0	120	70 - 130			
Carbon disulfide	10440	2500	10000	0	104	70 - 130			
Carbon tetrachloride	5457	1250	5000	0	109	70 - 130			
Chlorobenzene	5331	1250	5000	0	107	70 - 114			
Chloroethane	4688	1250	5000	0	93.8	70 - 130			
Chloroform	4232	1250	5000	0	84.6	70 - 125			
Chloromethane	3228	1250	5000	0	64.6	70 - 130			S
cis-1,3-Dichloropropene	4368	1250	5000	0	87.4	70 - 125			
Dibromochloromethane	5219	1250	5000	0	104	70 - 124			
Dibromomethane	4525	1250	5000	0	90.5	70 - 124			
Ethylbenzene	5576	1250	5000	0	112	70 - 124			
Hexachlorobutadiene	5581	1250	5000	0	112	70 - 130			
Methylene chloride	4913	2500	5000	0	98.3	70 - 128			
Styrene	19010	1250	5000	12120	138	70 - 130			S

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES					
MS		Sample ID: HS24010950-09MS		Units: ug/L		Analysis Date: 26-Jan-2024 00:48			
Client ID:		Run ID: VOA9_457279		SeqNo: 7808165		PrepDate:		DF: 250	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	6500	1250	5000	0	130	70 - 130			
Toluene	5548	1250	5000	0	111	70 - 123			
trans-1,2-Dichloroethene	5169	1250	5000	0	103	70 - 130			
trans-1,3-Dichloropropene	4376	1250	5000	0	87.5	70 - 121			
Trichloroethene	5361	1250	5000	0	107	70 - 129			
Vinyl acetate	8352	2500	10000	0	83.5	70 - 130			
Vinyl chloride	4488	500	5000	0	89.8	70 - 130			
Xylenes, Total	17480	1250	15000	0	117	70 - 130			
Total Trihalomethanes (TTHMs)	19240	1250	20000	0	96.2	65 - 135			
Surr: 1,2-Dichloroethane-d4	9043	1250	12500	0	72.3	70 - 126			
Surr: 4-Bromofluorobenzene	13000	1250	12500	0	104	82 - 124			
Surr: Dibromofluoromethane	10740	1250	12500	0	85.9	77 - 123			
Surr: Toluene-d8	13070	1250	12500	0	105	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES						
MSD		Sample ID: HS24010950-09MSD		Units: ug/L		Analysis Date: 26-Jan-2024 01:10				
Client ID:		Run ID: VOA9_457279		SeqNo: 7808166		PrepDate:		DF: 250		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	4543	1250	5000	0	90.9	70 - 130	4559	0.37	20	
1,1,2,2-Tetrachloroethane	4626	1250	5000	0	92.5	70 - 123	4657	0.663	20	
1,1,2-Trichloroethane	5041	1250	5000	0	101	70 - 117	5045	0.0826	20	
1,1-Dichloroethane	4402	1250	5000	0	88.0	70 - 127	4231	3.95	20	
1,1-Dichloroethene	5198	1250	5000	0	104	70 - 130	5230	0.604	20	
1,2-Dibromoethane	5010	1250	5000	0	100	70 - 124	5196	3.64	20	
1,2-Dichlorobenzene	4931	1250	5000	0	98.6	70 - 115	4901	0.627	20	
1,2-Dichloroethane	4430	1250	5000	0	88.6	70 - 127	4493	1.4	20	
1,2-Dichloropropane	4418	1250	5000	0	88.4	70 - 122	4441	0.512	20	
1,3-Dichlorobenzene	4974	1250	5000	0	99.5	70 - 119	5045	1.4	20	
1,4-Dichlorobenzene	4926	1250	5000	0	98.5	70 - 114	5041	2.31	20	
2-Butanone	6047	2500	10000	0	60.5	70 - 130	6304	4.17	20	S
2-Chloroethyl vinyl ether	U	2500	10000	0	0	65 - 135	0	0	20	S
Acetonitrile	47690	12500	50000	0	95.4	70 - 130	48340	1.35	20	
Acrolein	6902	5000	10000	0	69.0	70 - 130	5467	23.2	20	SR
Acrylonitrile	9348	2500	10000	0	93.5	70 - 130	8497	9.54	20	
Benzene	4727	1250	5000	0	94.5	70 - 127	4914	3.88	20	
Benzyl Chloride	3176	1250	5000	0	63.5	70 - 130	3243	2.07	20	S
Bromodichloromethane	4697	1250	5000	0	93.9	70 - 124	4777	1.69	20	
Bromoform	4986	1250	5000	0	99.7	70 - 129	5007	0.403	20	
Bromomethane	5553	1250	5000	0	111	70 - 130	5994	7.65	20	
Carbon disulfide	9936	2500	10000	0	99.4	70 - 130	10440	4.95	20	
Carbon tetrachloride	5399	1250	5000	0	108	70 - 130	5457	1.05	20	
Chlorobenzene	5161	1250	5000	0	103	70 - 114	5331	3.23	20	
Chloroethane	4848	1250	5000	0	97.0	70 - 130	4688	3.34	20	
Chloroform	4051	1250	5000	0	81.0	70 - 125	4232	4.36	20	
Chloromethane	3146	1250	5000	0	62.9	70 - 130	3228	2.55	20	S
cis-1,3-Dichloropropene	4368	1250	5000	0	87.4	70 - 125	4368	0	20	
Dibromochloromethane	5108	1250	5000	0	102	70 - 124	5219	2.16	20	
Dibromomethane	4586	1250	5000	0	91.7	70 - 124	4525	1.35	20	
Ethylbenzene	5401	1250	5000	0	108	70 - 124	5576	3.18	20	
Hexachlorobutadiene	5236	1250	5000	0	105	70 - 130	5581	6.38	20	
Methylene chloride	5020	2500	5000	0	100	70 - 128	4913	2.16	20	
Styrene	18370	1250	5000	12120	125	70 - 130	19010	3.42	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457279 (0)		Instrument: VOA9		Method: VOLATILES						
MSD	Sample ID: HS24010950-09MSD	Units: ug/L			Analysis Date: 26-Jan-2024 01:10					
Client ID:	Run ID: VOA9_457279		SeqNo: 7808166		PrepDate:		DF: 250			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Tetrachloroethene	6213	1250	5000	0	124	70 - 130	6500	4.51	20	
Toluene	5320	1250	5000	0	106	70 - 123	5548	4.19	20	
trans-1,2-Dichloroethene	5188	1250	5000	0	104	70 - 130	5169	0.367	20	
trans-1,3-Dichloropropene	4249	1250	5000	0	85.0	70 - 121	4376	2.94	20	
Trichloroethene	5195	1250	5000	0	104	70 - 129	5361	3.14	20	
Vinyl acetate	8235	2500	10000	0	82.4	70 - 130	8352	1.41	20	
Vinyl chloride	4215	500	5000	0	84.3	70 - 130	4488	6.27	20	
Xylenes, Total	16710	1250	15000	0	111	70 - 130	17480	4.52	20	
Total Trihalomethanes (TTHMs)	18840	1250	20000	0	94.2	65 - 135	19240	2.06	30	
Surr: 1,2-Dichloroethane-d4	9145	1250	12500	0	73.2	70 - 126	9043	1.12	20	
Surr: 4-Bromofluorobenzene	12950	1250	12500	0	104	82 - 124	13000	0.439	20	
Surr: Dibromofluoromethane	10330	1250	12500	0	82.7	77 - 123	10740	3.82	20	
Surr: Toluene-d8	13210	1250	12500	0	106	82 - 127	13070	1.04	20	
The following samples were analyzed in this batch: HS24011276-01										

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: 206463 (0)		Instrument: Skalar 02		Method: BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011					
MBLK	Sample ID: MBLK-206463	Units: mg/L		Analysis Date: 30-Jan-2024 15:31					
Client ID:	Run ID: Skalar 02_457539		SeqNo: 7803082		PrepDate: 25-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206463	Units: mg/L		Analysis Date: 30-Jan-2024 15:31					
Client ID:	Run ID: Skalar 02_457539		SeqNo: 7803081		PrepDate: 25-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	174.6	2.00	198	0	88.2	85 - 115			

DUP	Sample ID: HS24011319-01DUP	Units: mg/L		Analysis Date: 30-Jan-2024 15:31					
Client ID:	Run ID: Skalar 02_457539		SeqNo: 7803080		PrepDate: 25-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00					0.86	0	20

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: 206464 (0)		Instrument: Skalar 02		Method: CBOD BY SM5210B-2011					
MBLK	Sample ID: MBLK-206464	Units: mg/L		Analysis Date: 30-Jan-2024 16:53					
Client ID:		Run ID: Skalar 02_457556		SeqNo: 7803670		PrepDate: 25-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206464	Units: mg/L		Analysis Date: 30-Jan-2024 16:53					
Client ID:		Run ID: Skalar 02_457556		SeqNo: 7803669		PrepDate: 25-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	177.6	2.00	198	0	89.7	85 - 115			

DUP	Sample ID: HS24011276-01DUP	Units: mg/L		Analysis Date: 30-Jan-2024 16:53					
Client ID: OF-001		Run ID: Skalar 02_457556		SeqNo: 7803668		PrepDate: 25-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	2.39	2.00					2.28	4.71	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206495 (0)		Instrument: UV-2450		Method: SURFACTANTS (MBAS) BY SM5540C						
MBLK	Sample ID: MBLK-206495	Units: mg/L 340 MW LAS		Analysis Date: 26-Jan-2024 09:30						
Client ID:	Run ID: UV-2450_457274		SeqNo: 7797463		PrepDate: 26-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	U	0.0500								
LCS	Sample ID: LCS-206495	Units: mg/L 340 MW LAS		Analysis Date: 26-Jan-2024 09:30						
Client ID:	Run ID: UV-2450_457274		SeqNo: 7797461		PrepDate: 26-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.513	0.0500	0.5	0	103	85 - 115				
LCSD	Sample ID: LCSD-206495	Units: mg/L 340 MW LAS		Analysis Date: 26-Jan-2024 09:30						
Client ID:	Run ID: UV-2450_457274		SeqNo: 7797462		PrepDate: 26-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.513	0.0500	0.5	0	103	85 - 115	0.513	0	20	
MS	Sample ID: HS24011059-01MS	Units: mg/L 340 MW LAS		Analysis Date: 26-Jan-2024 09:30						
Client ID:	Run ID: UV-2450_457274		SeqNo: 7797460		PrepDate: 26-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.504	0.0500	0.5	0.075	85.8	80 - 120				
The following samples were analyzed in this batch: HS24011276-01										

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206737 (0)		Instrument: WetChem_HS		Method: TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011					
MBLK	Sample ID: MBLK-206737	Units: mg/L		Analysis Date: 31-Jan-2024 10:20					
Client ID:	Run ID: WetChem_HS_457640		SeqNo: 7805863		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		U	0.50						

LCS	Sample ID: LCS-206737	Units: mg/L		Analysis Date: 31-Jan-2024 10:20					
Client ID:	Run ID: WetChem_HS_457640		SeqNo: 7805862		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		20.43	0.50	20	0	102	85 - 115		

MS	Sample ID: HS24011276-01MS	Units: mg/L		Analysis Date: 31-Jan-2024 10:20					
Client ID: OF-001	Run ID: WetChem_HS_457640		SeqNo: 7805860		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		25.02	0.50	20	4.866	101	75 - 125		

MSD	Sample ID: HS24011276-01MSD	Units: mg/L		Analysis Date: 31-Jan-2024 10:20					
Client ID: OF-001	Run ID: WetChem_HS_457640		SeqNo: 7805861		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		25.04	0.50	20	4.866	101	75 - 125	25.02	0.0479 20

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: 206762 (0)		Instrument: UV-2450		Method: CYANIDE BY SM 4500CN E&G-2011					
MBLK	Sample ID: MBLK-206762	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808872		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	U	0.00500							

LCS	Sample ID: LCS-206762	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808871		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.206	0.00500	0.2	0	103	80 - 120			

MS	Sample ID: HS24011692-05MS	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808869		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.213	0.00500	0.2	0.001	106	80 - 120			

MSD	Sample ID: HS24011692-05MSD	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808870		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.213	0.00500	0.2	0.001	106	80 - 120	0.213	0	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 206826 (0)		Instrument: UV-2450		Method: AMMONIA AS N BY SM4500 NH3-B-F-2011						
MBLK	Sample ID: MBLK-206826	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810934		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	U	0.050								
LCS	Sample ID: LCS-206826	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810933		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	0.543	0.050	0.5	0	109	85 - 115				
MS	Sample ID: HS24011774-01MS	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810931		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	0.906	0.050	0.5	0.466	88.0	80 - 120				
MS	Sample ID: HS24011487-02MS	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810929		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	1.162	0.050	0.5	0.61	110	80 - 120				E
MSD	Sample ID: HS24011774-01MSD	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810932		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	0.911	0.050	0.5	0.466	89.0	80 - 120	0.906	0.55	20	
MSD	Sample ID: HS24011487-02MSD	Units: mg/L		Analysis Date: 02-Feb-2024 11:08						
Client ID:	Run ID: UV-2450_457884		SeqNo: 7810930		PrepDate: 01-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Nitrogen, Ammonia (as N)	1.164	0.050	0.5	0.61	111	80 - 120	1.162	0.172	20	E
The following samples were analyzed in this batch: HS24011276-01										

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: 207057 (0)		Instrument: UV-2450		Method: PHOSPHORUS BY SM4500P E-2011					
MBLK	Sample ID: MBLK-207057	Units: mg/L		Analysis Date: 07-Feb-2024 14:13					
Client ID:		Run ID: UV-2450_458265		SeqNo: 7819102		PrepDate: 07-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Phosphorus, Total (As P)	U	0.0500							

LCS	Sample ID: LCS-207057	Units: mg/L		Analysis Date: 07-Feb-2024 14:13					
Client ID:		Run ID: UV-2450_458265		SeqNo: 7819101		PrepDate: 07-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Phosphorus, Total (As P)	0.28	0.0500	0.25	0	112	80 - 120			

MS	Sample ID: HS24011276-01MS	Units: mg/L		Analysis Date: 07-Feb-2024 14:13					
Client ID: OF-001		Run ID: UV-2450_458265		SeqNo: 7819099		PrepDate: 07-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Phosphorus, Total (As P)	0.294	0.0500	0.25	0.034	104	80 - 120			

MSD	Sample ID: HS24011276-01MSD	Units: mg/L		Analysis Date: 07-Feb-2024 14:13					
Client ID: OF-001		Run ID: UV-2450_458265		SeqNo: 7819100		PrepDate: 07-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Phosphorus, Total (As P)	0.278	0.0500	0.25	0.034	97.6	80 - 120	0.294	5.59	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457117 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 24-Jan-2024 16:00					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794436		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	U	0.100							
Chloride	U	0.500							
Fluoride	U	0.100							
Nitrogen, Nitrate (As N)	U	0.100							
Nitrogen, Nitrite (As N)	U	0.100							
Nitrate/Nitrite (as N)	U	0.200							
Sulfate	U	0.500							

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 24-Jan-2024 16:12					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794437		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	4.053	0.100	4	0	101	90 - 110			
Chloride	19.96	0.500	20	0	99.8	90 - 110			
Fluoride	3.886	0.100	4	0	97.2	90 - 110			
Nitrogen, Nitrate (As N)	3.99	0.100	4	0	99.8	90 - 110			
Nitrogen, Nitrite (As N)	3.996	0.100	4	0	99.9	90 - 110			
Nitrate/Nitrite (as N)	7.986	0.200	8	0	99.8	90 - 110			
Sulfate	20.19	0.500	20	0	101	90 - 110			

MS	Sample ID: HS24011022-01MS	Units: mg/L		Analysis Date: 24-Jan-2024 16:59					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794442		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	1.32	0.100	2	0	66.0	80 - 120			S
Chloride	132.2	0.500	10	127.4	48.5	80 - 120			SEO
Fluoride	2.38	0.100	2	0.4783	95.1	80 - 120			
Nitrogen, Nitrate (As N)	8.512	0.100	2	6.977	76.8	80 - 120			S
Nitrogen, Nitrite (As N)	1.646	0.100	2	0	82.3	80 - 120			
Nitrate/Nitrite (as N)	10.16	0.200	4	6.977	79.6	80 - 120			S
Sulfate	54.86	0.500	10	47.67	71.9	80 - 120			SO

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457117 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MS	Sample ID: HS24010857-03MS	Units: mg/L		Analysis Date: 24-Jan-2024 18:32					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794454		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	1.833	0.100	2	0	91.6	80 - 120			
Chloride	9.756	0.500	10	0.168	95.9	80 - 120			
Fluoride	1.886	0.100	2	0.0716	90.7	80 - 120			
Nitrogen, Nitrate (As N)	1.918	0.100	2	0	95.9	80 - 120			
Nitrogen, Nitrite (As N)	1.956	0.100	2	0.0305	96.3	80 - 120			
Nitrate/Nitrite (as N)	3.873	0.200	4	0.0305	96.1	80 - 120			
Sulfate	9.889	0.500	10	0.5664	93.2	80 - 120			

MSD	Sample ID: HS24011022-01MSD	Units: mg/L		Analysis Date: 24-Jan-2024 17:04					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794443		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	1.393	0.100	2	0	69.6	80 - 120	1.32	5.4	20 S
Chloride	132.1	0.500	10	127.4	46.7	80 - 120	132.2	0.137	20 SEO
Fluoride	2.374	0.100	2	0.4783	94.8	80 - 120	2.38	0.257	20
Nitrogen, Nitrate (As N)	8.53	0.100	2	6.977	77.7	80 - 120	8.512	0.204	20 S
Nitrogen, Nitrite (As N)	1.645	0.100	2	0	82.2	80 - 120	1.646	0.0912	20
Nitrate/Nitrite (as N)	10.17	0.200	4	6.977	80.0	80 - 120	10.16	0.156	20 S
Sulfate	54.93	0.500	10	47.67	72.6	80 - 120	54.86	0.121	20 SO

MSD	Sample ID: HS24010857-03MSD	Units: mg/L		Analysis Date: 24-Jan-2024 18:38					
Client ID:	Run ID: ICS-Integrion_457117		SeqNo: 7794455		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	1.915	0.100	2	0	95.7	80 - 120	1.833	4.39	20
Chloride	9.746	0.500	10	0.168	95.8	80 - 120	9.756	0.103	20
Fluoride	1.822	0.100	2	0.0716	87.5	80 - 120	1.886	3.46	20
Nitrogen, Nitrate (As N)	1.915	0.100	2	0	95.8	80 - 120	1.918	0.13	20
Nitrogen, Nitrite (As N)	1.952	0.100	2	0.0305	96.1	80 - 120	1.956	0.189	20
Nitrate/Nitrite (as N)	3.867	0.200	4	0.0305	95.9	80 - 120	3.873	0.16	20
Sulfate	10	0.500	10	0.5664	94.3	80 - 120	9.889	1.12	20

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457275 (0)		Instrument: WetChem_HS		Method: COLOR BY SM 2120B - 2011					
MBLK	Sample ID: MBLK-R457275	Units: Color Units		Analysis Date: 26-Jan-2024 09:30					
Client ID:	Run ID: WetChem_HS_457275		SeqNo: 7797506		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	U	5.00							

LCS	Sample ID: LCS-R457275	Units: Color Units		Analysis Date: 26-Jan-2024 09:30					
Client ID:	Run ID: WetChem_HS_457275		SeqNo: 7797505		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115			

LCSD	Sample ID: LCSD-R457275	Units: Color Units		Analysis Date: 26-Jan-2024 09:30					
Client ID:	Run ID: WetChem_HS_457275		SeqNo: 7797504		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115	50	0	20

DUP	Sample ID: HS24011276-01DUP	Units: Color Units		Analysis Date: 26-Jan-2024 09:30					
Client ID: OF-001	Run ID: WetChem_HS_457275		SeqNo: 7797507		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	75	25.0					75	0	20

The following samples were analyzed in this batch: HS24011276-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK1

WorkOrder:HS24011276

QC BATCH REPORT

Batch ID: R457552 (0)		Instrument: TOC_05		Method: TOTAL ORGANIC CARBON - SM5310B-2011					
MBLK	Sample ID: MBLK-01292024	Units: mg/L		Analysis Date: 30-Jan-2024 00:22					
Client ID:	Run ID: TOC_05_457552		SeqNo: 7803601		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Organic Carbon, TotalU1.00									
LCS	Sample ID: LCS-01292024	Units: mg/L		Analysis Date: 30-Jan-2024 00:37					
Client ID:	Run ID: TOC_05_457552		SeqNo: 7803602		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Organic Carbon, Total10.11.00100010185 - 115									
LCSD	Sample ID: LCSD-01292024	Units: mg/L		Analysis Date: 30-Jan-2024 00:53					
Client ID:	Run ID: TOC_05_457552		SeqNo: 7803603		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Organic Carbon, Total10.151.00100010285 - 11510.10.49420									
MS	Sample ID: HS24011515-01MS	Units: mg/L		Analysis Date: 30-Jan-2024 02:39					
Client ID:	Run ID: TOC_05_457552		SeqNo: 7803610		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Organic Carbon, Total20.261.001010.2510080 - 120									
The following samples were analyzed in this batch: HS24011276-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457693 (0)		Instrument: WetChem_HS		Method: SULFIDE BY E376.1					
MBLK	Sample ID: MBLK-R457693	Units: mg/L		Analysis Date: 31-Jan-2024 15:13					
Client ID:	Run ID: WetChem_HS_457693		SeqNo: 7806342		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfide	U	2.00							

LCS	Sample ID: LCS-R457693	Units: mg/L		Analysis Date: 31-Jan-2024 15:13					
Client ID:	Run ID: WetChem_HS_457693		SeqNo: 7806341		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfide	22.12	2.00	25	0	88.5	80 - 120			

LCSD	Sample ID: LCSD-R457693	Units: mg/L		Analysis Date: 31-Jan-2024 15:13					
Client ID:	Run ID: WetChem_HS_457693		SeqNo: 7806340		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfide	21.92	2.00	25	0	87.7	80 - 120	22.12	0.908	20

MS	Sample ID: HS24011276-01MS	Units: mg/L		Analysis Date: 31-Jan-2024 15:13					
Client ID: OF-001	Run ID: WetChem_HS_457693		SeqNo: 7806343		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfide	21.92	2.00	25	-1.08	92.0	80 - 120			

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457712 (0)		Instrument: Balance1		Method: TOTAL SUSPENDED SOLIDS BY SM 2540D-2011					
MBLK	Sample ID: WMBLK-01302024	Units: mg/L		Analysis Date: 31-Jan-2024 11:00					
Client ID:	Run ID: Balance1_457712	SeqNo: 7806662		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		U	2.50						
LCS	Sample ID: WLCS-01302024	Units: mg/L		Analysis Date: 31-Jan-2024 11:00					
Client ID:	Run ID: Balance1_457712	SeqNo: 7806661		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		86	2.50	100	0	86.0	85 - 115		
DUP	Sample ID: HS24011523-02DUP	Units: mg/L		Analysis Date: 31-Jan-2024 11:00					
Client ID:	Run ID: Balance1_457712	SeqNo: 7806659		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		93.5	2.50				96.5	3.16	20
DUP	Sample ID: HS24011369-01DUP	Units: mg/L		Analysis Date: 31-Jan-2024 11:00					
Client ID:	Run ID: Balance1_457712	SeqNo: 7806654		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		31.5	2.50				32.5	3.12	20
The following samples were analyzed in this batch:		HS24011276-01							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457800 (0)		Instrument:		Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011				
MBLK	Sample ID: WMBLK-01312024	Units: mg/L		Analysis Date: 31-Jan-2024 13:00						
Client ID:	Run ID: Balance1_457800	SeqNo: 7809013		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		U	10.0							
LCS	Sample ID: WLCS-01312024	Units: mg/L		Analysis Date: 31-Jan-2024 13:00						
Client ID:	Run ID: Balance1_457800	SeqNo: 7809012		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		1122	10.0	1000	0	112	85 - 115			
DUP	Sample ID: HS24011606-05DUP	Units: mg/L		Analysis Date: 31-Jan-2024 13:00						
Client ID:	Run ID: Balance1_457800	SeqNo: 7809008		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		748	10.0				744	0.536	20	
DUP	Sample ID: HS24011537-05DUP	Units: mg/L		Analysis Date: 31-Jan-2024 13:00						
Client ID:	Run ID: Balance1_457800	SeqNo: 7808999		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		826	10.0				830	0.483	20	
The following samples were analyzed in this batch:		HS24011276-01								

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457806 (0)		Instrument: Skalar 02		Method: DISSOLVED OXYGEN BY SM4500-O G					
DUP	Sample ID: HS24011577-01DUP		Units: mg/L		Analysis Date: 01-Feb-2024 14:45				
Client ID:	Run ID: Skalar 02_457806		SeqNo: 7809180		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Oxygen, Dissolved	6.1	1.00					6.01	1.49	20
The following samples were analyzed in this batch:									
HS24011276-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457886 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A					
MBLK	Sample ID: WMBLK-02022024	Units: mg/L		Analysis Date: 02-Feb-2024 07:00					
Client ID:	Run ID: Balance1_457886	SeqNo: 7810997		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Oil and Grease	U	2.00							

LCS	Sample ID: LCS-02022024	Units: mg/L		Analysis Date: 02-Feb-2024 07:00					
Client ID:	Run ID: Balance1_457886	SeqNo: 7810995		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Oil and Grease	42.3	2.00	40	0	106	78 - 114			

LCSD	Sample ID: LCSD-02022024	Units: mg/L		Analysis Date: 02-Feb-2024 07:00					
Client ID:	Run ID: Balance1_457886	SeqNo: 7810996		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Oil and Grease	44.8	2.00	40	0	112	78 - 114	42.3	5.74	18

MS	Sample ID: HS24011276-01MS	Units: mg/L		Analysis Date: 02-Feb-2024 07:00					
Client ID: OF-001	Run ID: Balance1_457886	SeqNo: 7810975		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Oil and Grease	43.9	2.00	40	2.609	103	78 - 114			

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R457906 (0)		Instrument: WetChem_HS		Method: RESIDUAL CHLORINE BY SM4500CL F-2011					
MBLK	Sample ID: MBLK-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811299		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	U	0.10							

LCS	Sample ID: LCS-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811298		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.5	0.10	3.66	0	95.6	85 - 115			

LCSD	Sample ID: LCSD-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811301		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.6	0.10	3.66	0	98.4	85 - 115	3.5	2.82	20

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811300		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.6	0.10	3.66	0	98.4	80 - 120			

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R457930 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993					
MBLK	Sample ID: MBLK-R457930	Units: mg/L		Analysis Date: 02-Feb-2024 16:30					
Client ID:	Run ID: WetChem_HS_457930		SeqNo: 7811919		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	U	15.0							

LCS	Sample ID: LCS-R457930	Units: mg/L		Analysis Date: 02-Feb-2024 16:30					
Client ID:	Run ID: WetChem_HS_457930		SeqNo: 7811918		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	100	15.0	100	0	100	85 - 115			

MS	Sample ID: HS24011642-01MS	Units: mg/L		Analysis Date: 02-Feb-2024 16:30					
Client ID:	Run ID: WetChem_HS_457930		SeqNo: 7811921		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	63	15.0	50	16	94.0	80 - 120			

MSD	Sample ID: HS24011642-01MSD	Units: mg/L		Analysis Date: 02-Feb-2024 16:30					
Client ID:	Run ID: WetChem_HS_457930		SeqNo: 7811920		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	64	15.0	50	16	96.0	80 - 120	63	1.57	20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

QC BATCH REPORT

Batch ID: R458055 (0)		Instrument: WetChem_HS		Method: SULFITE BY SM4500SO3B					
MBLK	Sample ID: MBLK-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814593		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	U	5.00							

LCS	Sample ID: LCS-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814592		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	0	104	80 - 120			

LCSD	Sample ID: LCSD-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814591		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	0	104	80 - 120	52	0	20

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814594		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	1	102	75 - 125			

The following samples were analyzed in this batch: HS24011276-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R458120 (0)		Instrument: WetChem_HS		Method: PH BY SM4500H+ B-2011					
DUP	Sample ID: HS24011537-01DUP		Units: pH Units		Analysis Date: 06-Feb-2024 13:34				
Client ID:	Run ID: WetChem_HS_458120		SeqNo: 7816172		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
pH	7.8	0.100					7.75	0.643	10
Temp Deg C @pH	12.3	0					12.6	2.41	10
The following samples were analyzed in this batch: HS24011276-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

QC BATCH REPORT

Batch ID: R458262 (0)		Instrument: Skalar 03		Method: ALKALINITY BY -2011					
MBLK	Sample ID: MBLK-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 12:30					
Client ID:	Run ID: Skalar 03_458262		SeqNo: 7819069		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		U	5.00						

LCS	Sample ID: LCS-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 12:37					
Client ID:	Run ID: Skalar 03_458262		SeqNo: 7819070		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		950.8	5.00	1000	0	95.1	85 - 115		

LCSD	Sample ID: LCSD-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 12:44					
Client ID:	Run ID: Skalar 03_458262		SeqNo: 7819071		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		949.4	5.00	1000	0	94.9	85 - 115	950.8	0.147 20

DUP	Sample ID: HS24011642-01DUP	Units: mg/L		Analysis Date: 07-Feb-2024 12:55					
Client ID:	Run ID: Skalar 03_458262		SeqNo: 7819073		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		325.8	5.00					328.2	0.734 20

The following samples were analyzed in this batch: HS24011276-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
WorkOrder: HS24011276

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/L	Milligrams per Liter
UG/L	Micrograms per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L22-90-R2	31-Mar-2024
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024



07-Feb-2024

Andrew Neir
ALS Environmental
10450 Stancliff Rd
Suite 210
Houston, TX 77099

Re: **HS24011276**

Work Order: **24011733**

Dear Andrew,

ALS Environmental received 3 samples on 26-Jan-2024 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Chelsey Cook

Electronically approved by: Chelsey Cook

Chelsey Cook
Project Manager

Report of Laboratory Analysis

Certificate No: TX: T104704494-23-14

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Client: ALS Environmental
Project: HS24011276
Work Order: 24011733

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
24011733-01	OF-001	Water	HS24011276-01	1/24/2024 10:08	1/26/2024 10:00	<input type="checkbox"/>
24011733-01	OF-001	Water		1/24/2024 10:08	1/26/2024 10:00	<input type="checkbox"/>
24011733-02	Field Duplicate	Water		1/24/2024 10:08	1/26/2024 10:00	<input type="checkbox"/>
24011733-03	Field Blank	Water		1/24/2024 10:08	1/26/2024 10:00	<input type="checkbox"/>

Client: ALS Environmental
Project: HS24011276
WorkOrder: 24011733

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

Client: ALS Environmental
Project: HS24011276
Work Order: 24011733

Case Narrative

Samples for the above noted Work Order were received on 01/26/2024. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Metals:

No deviations or anomalies were noted.

Wet Chemistry:

No deviations or anomalies were noted.

Client:

ALS Environmental

Project:

HS24011276

Sample ID:

OF-001

Collection Date:

1/24/2024 10:08 AM

Work Order:

24011733

Lab ID:

24011733-01

Matrix:

WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY IN WATER			E1631E		Prep: E1631E 2/1/24 10:44	Analyst: KRA
Mercury	0.00453		0.00050	µg/L	1	2/1/2024 01:04 PM
CYANIDE, AVAILABLE			OIA 1677-09			Analyst: MB
Cyanide, Available	ND		2.0	µg/L	1	1/29/2024 10:00 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	ALS Environmental					
Project:	HS24011276				Work Order:	24011733
Sample ID:	Field Duplicate				Lab ID:	24011733-02
Collection Date:	1/24/2024 10:08 AM				Matrix:	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY IN WATER			E1631E		Prep: E1631E 2/1/24 10:44	Analyst: KRA
Mercury	ND		0.00050	µg/L	1	2/1/2024 01:12 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	ALS Environmental					
Project:	HS24011276				Work Order:	24011733
Sample ID:	Field Blank				Lab ID:	24011733-03
Collection Date:	1/24/2024 10:08 AM				Matrix:	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY IN WATER			E1631E		Prep: E1631E 2/1/24 10:44	Analyst: KRA
Mercury	ND		0.00050	µg/L	1	2/1/2024 01:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: ALS Environmental
Work Order: 24011733
Project: HS24011276

QC BATCH REPORT

Batch ID: 234292 Instrument ID HG3 Method: E1631E

MBLK1		Sample ID: MBLK1-234292-234292				Units: ng/L		Analysis Date: 2/1/2024 12:57 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444497		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury ND 0.50 0 0 0 0

MBLK2		Sample ID: MBLK2-234292-234292				Units: ng/L		Analysis Date: 2/1/2024 01:28 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444501		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury ND 0.50 0 0 0 0

MBLK3		Sample ID: MBLK3-234292-234292				Units: ng/L		Analysis Date: 2/1/2024 01:59 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444505		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury ND 0.50 0 0 0 0

MS		Sample ID: 24011809-02BMS				Units: ng/L		Analysis Date: 2/1/2024 02:22 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444508		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 6.51 0.50 5 1.39 102 71-125 0

MSD		Sample ID: 24011809-02BMSD				Units: ng/L		Analysis Date: 2/1/2024 02:38 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444510		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 6.15 0.50 5 1.39 95.2 71-125 6.51 5.69 24

LCS-OPR-START		Sample ID: OPR-START-234292-234292				Units: ng/L		Analysis Date: 2/1/2024 12:49 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444496		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 4.87 0.50 5 0 97.4 77-123 0

LCS-OPR-END		Sample ID: OPR-END-234292-234292				Units: ng/L		Analysis Date: 2/1/2024 03:01 PM		
Client ID:		Run ID: HG3_240201A				SeqNo: 10444513		Prep Date: 2/1/2024		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 4.78 0.50 5 0 95.6 77-123 0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ALS Environmental
Work Order: 24011733
Project: HS24011276

QC BATCH REPORT

Batch ID: 234292 Instrument ID HG3 Method: E1631E

The following samples were analyzed in this batch:

24011733-01B	24011733-02B	24011733-03B
--------------	--------------	--------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ALS Environmental
Work Order: 24011733
Project: HS24011276

QC BATCH REPORT

Batch ID: **R395289** Instrument ID **FS3100** Method: **OIA 1677-09**

MBLK		Sample ID: MBLK-1-R395289				Units: µg/L		Analysis Date: 1/29/2024 10:00 AM		
Client ID:		Run ID: FS3100_240129A				SeqNo: 10433848		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	ND	2.0								

LCS		Sample ID: LCS-1-R395289				Units: µg/L		Analysis Date: 1/29/2024 10:00 AM		
Client ID:		Run ID: FS3100_240129A				SeqNo: 10433846		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	49.68	2.0	50	0	99.4	82-132	0			

MS		Sample ID: 24011644-01A MS				Units: µg/L		Analysis Date: 1/29/2024 10:00 AM		
Client ID:		Run ID: FS3100_240129A				SeqNo: 10433834		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	55.13	2.0	50	-0.088	110	82-130	0			

MSD		Sample ID: 24011644-01A MSD				Units: µg/L		Analysis Date: 1/29/2024 10:00 AM		
Client ID:		Run ID: FS3100_240129A				SeqNo: 10433835		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Available	56.31	2.0	50	-0.088	113	82-130	55.13	2.11	11	

The following samples were analyzed in this batch:

24011733-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

24011733

ALS - HOUSTON: ALS Environmental
Project: HS24011276



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24540

SUBCONTRACT TO:

ALS Group USA, Corp.
3352 - 128th Ave
Holland, MI 494249263

Phone: +1 616 399 6070

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011276
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS24011276-01	OF-001	Water	24 Jan 2024 10:08
	SUB_Available Cyanide			07 Feb 2024
	Sub_MercuryLow			07 Feb 2024
2.	HS24011276-02	Field Duplicate	Water	24 Jan 2024 10:08
	Sub_MercuryLow			07 Feb 2024
3.	HS24011276-03	Field Blank	Water	24 Jan 2024 10:08
	Sub_MercuryLow			07 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:




Date/Time:

1/25/24 1800

Received By:

Date/Time:

1-26-24 10:00

Cooler ID(s):

Temperature(s):

3.9c DFZ

RIGHT SOLUTIONS | RIGHT PARTNER

ALS 010 0000

Sample Receipt Checklist

Client Name: **ALS - HOUSTON**

Date/Time Received: **26-Jan-24 10:00**

Work Order: **24011733**

Received by: **CMK**

Checklist completed by **Caleb Koetje**

26-Jan-24

Reviewed by: **Chelsey Cook**

29-Jan-24

eSignature

Date

eSignature

Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

Sample(s) received on ice?

Yes ☒

No ☐

Temperature(s)/Thermometer(s):

3.9c

DF2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

1/26/2024 3:38:42 PM

Water - VOA vials have zero headspace?

Yes ☐

No ☐

No VOA vials submitted ☒

Water - pH acceptable upon receipt?

Yes ☐

No ☐

N/A ☒

pH adjusted?

Yes ☐

No ☐

N/A ☒

pH adjusted by:

-

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

Laboratory Analysis Report

Total Number of Pages: 6

Job ID : 24012601



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

Client Project Name : HS24011276

Report To :	Client Name:	ALS Group USA, Corp.	P.O.#:
	Attn:	Andy C. Neir	Sample Collected By:
	Client Address:	10450 Stancliff Rd., Ste. 210	Date Collected: 01/24/24
	City, State, Zip:	Houston, Texas, 77099	

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
HS24011276-01 / OF-001	Water	24012601.01

A handwritten signature in black ink, appearing to read 'S. C. W. K.'.

Released By: Senthilkumar Sevukan
Title: Vice President Operations
Date: 1/31/2024



This Laboratory is NELAP (T104704213-23-31) accredited. Effective: 04/13/2023; Expires: 3/31/2024
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Results apply to the sample as received. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

ab-q210-0321

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 24012601

Date: 1/31/2024

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
J	Estimation. Below calibration range but above MDL	RptLimit	Reporting Limit
LCS	Laboratory Check Standard	SDL	Sample Detection Limit
LCSD	Laboratory Check Standard Duplicate	surr	Surrogate
MS	Matrix Spike	T	Time
MSD	Matrix Spike Duplicate	TNTC	Too numerous to count
MW	Molecular Weight	UQL	Unadjusted Upper Quantitation Limit
MQL	Unadjusted Minimum Quantitation Limit		

Qualifier Definition



LABORATORY TEST RESULTS

Job ID : 24012601

Date 1/31/2024

Client Name: ALS Group USA, Corp.

Attn: Andy C. Neir

Project Name: HS24011276

Client Sample ID: HS24011276-01 / OF-001

Job Sample ID: 24012601.01

Date Collected: 01/24/24

Sample Matrix Water

Time Collected: 10:08

Other Information:

Test Method	Parameter/Test Description	Result	Units	DF	Rpt Limit	Reg Limit	Q	Date Time	Analyst
SW-846 8315A	Aldehydes by HPLC								
	Formaldehyde	BRL	mg/L	1.00	0.04			01/29/24 12:50	ARM

QUALITY CONTROL CERTIFICATE



Job ID : 24012601

Date : 1/31/2024

Analysis : Aldehydes by HPLC Method : SW-846 8315A Reporting Units : mg/L

QC Batch ID : Qb24012965 Created Date : 01/29/24 Created By : AMarapadaga

Samples in This QC Batch : 24012601.01

Extraction : PB24012641 Prep Method : SW-846 8315A Prep Date : 01/26/24 13:00 Prep By : Msoria

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	RptLimit	Qual
Formaldehyde	50-00-0	BRL	mg/L	1.00	0.04	

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
Formaldehyde	0.12	0.114	94.8	0.12	0.113	94.1	0.7	35	36-140	

QC Type: MS and MSD

QC Sample ID: 24012601.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Formaldehyde	BRL	0.12	0.0995	82.9						10-160	



Job ID:24012601



01/25/2024

ALS Group USA, Corp. ACH

10450 Stancliff Rd, Ste 210

Houston, TX 77099

T: +1 281 530 5656

F: +1 281 530 5887

www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24538

SUBCONTRACT TO:

A&B Environmental
10100 East Freeway, Ste 100
Houston, TX 77029

Phone: +1 713 453 6060

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011276
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24011276-01	OF-001	Water	24 Jan 2024 10:08
01AB SUB_FORMALDEHYDE			07 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: 292
Received By: [Signature]
Cooler ID(s): IR5

Date/Time: 1.25.24 16:05
Date/Time: 1/25/24 16:05
Temperature(s): 5.4°C



Sample Condition Checklist

A&B JobID : 24012601		Date Received : 01/25/2024		Time Received : 4:05PM			
Client Name : ALS Group USA, Corp.							
Temperature : 5.4°C		Sample pH : NA					
Thermometer ID : IR5		pH Paper ID : NA					
Perservative :		Lot# :					
	Check Points				Yes	No	N/A
1.	Cooler Seal present and signed.					X	
2.	Sample(s) in a cooler.				X		
3.	If yes, ice in cooler.				X		
4.	Sample(s) received with chain-of-custody.				X		
5.	C-O-C signed and dated.				X		
6.	Sample(s) received with signed sample custody seal.					X	
7.	Sample containers arrived intact. (If No comment)				X		
8.	Matrix: Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Solid <input type="checkbox"/> Cassette <input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Badge <input type="checkbox"/> Food <input type="checkbox"/> Other <input type="checkbox"/>						
9.	Samples were received in appropriate container(s)				X		
10.	Sample(s) were received with Proper preservative						X
11.	All samples were tagged or labeled.				X		
12.	Sample ID labels match C-O-C ID's.				X		
13.	Bottle count on C-O-C matches bottles found.				X		
14.	Sample volume is sufficient for analyses requested.				X		
15.	Samples were received with in the hold time.				X		
16.	VOA vials completely filled.						X
17.	Sample accepted.				X		
18.	Has client been contacted about sub-out						X

Comments : Include actions taken to resolve discrepancies/problem:

--

Brought by : Client

Received by : EValdez

Check in by/date : EValdez / 01/25/2024

ab-s005-1123



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

29 January 2024

ALS Group USA, Corp.
Attn: Accounts Payable
10450 Stancliff Rd. Suite #210
Houston, TX 77099

ALS

Enclosed are the results of analyses for samples received by the laboratory on 24-Jan-24 14:25. The analytical data provided relates only to the samples as received in this laboratory report.

ELI certifies that all results are NELAP compliant and performed in accordance with the referenced method except as noted in the Case Narrative or as noted with a qualifier. Any reproductions of this laboratory report should be in full and only with the written authorization from the client.

The total number of pages in this report is 5

Thank you for selecting ELI for your analytical needs. If you have any questions regarding this report, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read 'Julie Peterson'.

Julie Peterson
Client Services Representative



Certificate No: T104704265-22-20



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24A2552

Reported:
29-Jan-24 12:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HS 240111276-01 OF-001	24A2552-01	Water	24-Jan-24 10:08	24-Jan-24 14:25

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24A2552

Reported:
29-Jan-24 12:05

HS 240111276-01 OF-001
24A2552-01 (Water) Sampled: 24-Jan-24 10:08

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Analyst	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	---------	-------

Envirodyne Laboratories, Inc.

Microbiology

E.coli	2410	2	MPN/100 mL	2	B4A5716	24-Jan-24	24-Jan-24 16:15	SM9223 B	LN	
Enterococci	> 2420	1	MPN/100 mL	1	B4A5858	24-Jan-24	24-Jan-24 16:40	Enterolert	LTB	

Envirodyne Laboratories, Inc.

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Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24A2552

Reported:
29-Jan-24 12:05

Microbiology - Quality Control
Envirodyne Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B4A5716 - Microbiology

Blank (B4A5716-BLK1) Prepared & Analyzed: 24-Jan-24

E.coli <1 1 MPN/100 mL

Duplicate (B4A5716-DUP1) Source: 24A2552-01 Prepared & Analyzed: 24-Jan-24

E.coli 2600 2 MPN/100 mL 2410 7.75 0.402

Batch B4A5858 - Microbiology

Blank (B4A5858-BLK1) Prepared & Analyzed: 24-Jan-24

Enterococci <1 1 MPN/100 mL

Duplicate (B4A5858-DUP1) Source: 24A2287-02 Prepared & Analyzed: 24-Jan-24

Enterococci 25.0 1 MPN/100 mL 28.0 11.3 0.5366

Envirodyne Laboratories, Inc.

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Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24A2552

Reported:
29-Jan-24 12:05

Notes and Definitions

> > 2420

ND Analyte NOT DETECTED at or above the reporting limit

< Result is less than the RL

a Analyte not available for TNI/NELAP accreditation

n Not accredited

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



24A2552
27
mb
1/25/24

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24528

SUBCONTRACT TO:

Envirodyne Laboratories, Inc.
11011 Brooklet, Ste 230
Houston, TX 77099

Phone: +1 281 568 7880

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011276
TSR: Houston House Acct

1.	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	HS24011276-01	OF-001	Water	24 Jan 2024 10:08
	SUB_E. Coli			07 Feb 2024
	SUB_Enterococci			07 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:

Received By:

Cooler ID(s):

Date/Time:

1-24-24 1425

Date/Time:

1/24/24 1425

Temperature(s):

3.2/3.0

1RTH

RIGHT SOLUTIONS | RIGHT PARTNER

24 Jan 2024

Page 1 of 1

ALS Environmental - Houston, TX

Sample Delivery Group: L1699189
Samples Received: 01/26/2024
Project Number: HS24011276
Description:

Report To: Andy Neir
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Entire Report Reviewed By:



Reagan Johnson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

Page 94 of 106

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SAMPLE SUMMARY

OF-001 L1699189-01 WW

Collected by

Collected date/time

Received date/time

01/24/24 10:08

01/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 218.6M	WG2214217	1	01/31/24 06:15	01/31/24 06:15	SET	Mt. Juliet, TN

¹Cp ${}^2\text{Tc}$ ${}^3\text{Ss}$ ${}^4\text{Cn}$ ${}^5\text{Tr}$ ${}^6\text{Sr}$ ${}^7\text{Qc}$ ${}^8\text{Gf}$ ${}^9\text{Al}$ ^{10}Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Reagan Johnson
Project Manager



Laboratory Data Package Cover Page

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
 - a. Items consistent with NELAC Chapter 5,
 - b. dilution factors,
 - c. preparation methods,
 - d. cleanup methods, and
 - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
 - a. Calculated recovery (%R), and
 - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
 - a. LCS spiking amounts,
 - b. Calculated %R for each analyte, and
 - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a. Samples associated with the MS/MSD clearly identified,
 - b. MS/MSD spiking amounts,
 - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d. Calculated %Rs and relative percent differences (RPDs), and
 - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
 - a. The amount of analyte measured in the duplicate,
 - b. The calculated RPD, and
 - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.



Reagan Johnson
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National			LRC Date: 01/31/2024 17:38				
Project Name:			Laboratory Job Number: L1699189-01				
Reviewer Name: Reagan Johnson			Prep Batch Number(s): WG2214217				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National		LRC Date: 01/31/2024 17:38					
Project Name:		Laboratory Job Number: L1699189-01					
Reviewer Name: Reagan Johnson		Prep Batch Number(s): WG2214217					
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?			X		
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National		LRC Date: 01/31/2024 17:38	
Project Name:		Laboratory Job Number: L1699189-01	
Reviewer Name: Reagan Johnson		Prep Batch Number(s): WG2214217	
ER # ¹	Description		
The Exception Report intentionally left blank, there are no exceptions applied to this SDG.			
1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period. 2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable); 3. NA = Not applicable; 4. NR = Not reviewed; 5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).			

Wet Chemistry by Method 218.6M

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	0.000248	J	0.000150	0.000500	0.000500	1	01/31/2024 06:15	WG2214217

- 1Cp
- 2Tc
- 3Ss
- 4Cn
- 5Tr
- 6Sr
- 7Qc
- 8Gl
- 9Al
- 10Sc

Method Blank (MB)

(MB) R4028149-1 01/31/24 03:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexavalent Chromium	U		0.000150	0.000500

L1698349-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1698349-01 01/31/24 04:58 • (DUP) R4028149-3 01/31/24 05:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.00140	0.00140	1	0.157		20

L1699480-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1699480-01 01/31/24 06:48 • (DUP) R4028149-6 01/31/24 06:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4028149-2 01/31/24 03:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	0.00200	0.00217	109	90.0-110	

L1698372-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1698372-01 01/31/24 05:31 • (MS) R4028149-4 01/31/24 05:42 • (MSD) R4028149-5 01/31/24 05:53

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.0500	U	0.0520	0.0523	104	105	1	90.0-110			0.460	20

L1699811-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1699811-01 01/31/24 07:54 • (MS) R4028149-7 01/31/24 08:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	0.0500	U	0.0537	107	1	90.0-110	

1Cp

2Tc

3Ss

4Cn

5Tr

6Sr

7Qc

8Gl

9Al

10Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
---	---



ACCREDITATIONS & LOCATIONS

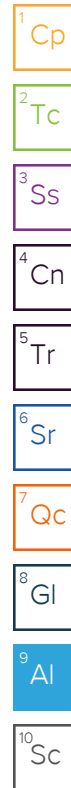
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

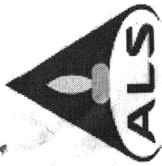
Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





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Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24539

SUBCONTRACT TO:

H232

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

Phone: +1 (61) 7 8-58

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011276
TSR: Houston House Acct

LAB SAMPLE ID CLIENT SAMPLE ID
ANALYSIS REQUESTED

COLLECT DATE
DUE DATE

1. **HS24011276-01** **OF-001**

24 Jan 2024 10:08

Low-level 218.6-ESC

Water

07 Feb 2024

1699189-01

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:

Date/Time:

Received By:

Date/Time:

Cooler ID(s):

Temperature(s):

Sample Receipt Checklist
COC Seal Present/Intact: ☒ Y ☐ N If Applicable
COC Signed/Accurate: ☒ Y ☐ N VOA Zero Headspace: ☒ Y ☐ N
Bottles active intact: ☒ Y ☐ N Pres. Correct/Check: ☒ Y ☐ N
Correct bottles used: ☒ Y ☐ N
Sufficient volume sent: ☒ Y ☐ N
PA Screen <0.5 mR/hr: ☒ Y ☐ N

RIGHT PARTNER

Client:

Project:

Work Order:

ChampionX LLC
2024 Permit Renewal-WK1
HS24011276

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24011276-01	OF-001	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>
HS24011276-02	Field Duplicate	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>
HS24011276-03	Field Blank	Water		24-Jan-2024 10:08	24-Jan-2024 12:20	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Sample ID: OF-001
Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT
WorkOrder:HS24011276
Lab ID:HS24011276-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624				Analyst: PC
1,1,1-Trichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1,2,2-Tetrachloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1,2-Trichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,1-Dichloroethane	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
1,1-Dichloroethene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dibromoethane	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichlorobenzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,2-Dichloropropane	U		0.700	5.00	ug/L	1	26-Jan-2024 07:53
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
1,4-Dichlorobenzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
2-Butanone	U		1.00	10.0	ug/L	1	26-Jan-2024 07:53
2-Chloroethyl vinyl ether	U		1.30	10.0	ug/L	1	26-Jan-2024 07:53
Acetonitrile	U	n	25.0	50.0	ug/L	1	26-Jan-2024 07:53
Acrolein	U		4.00	20.0	ug/L	1	26-Jan-2024 07:53
Acrylonitrile	U		4.00	10.0	ug/L	1	26-Jan-2024 07:53
Benzene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Benzyl Chloride	U	n	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Bromodichloromethane	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Bromoform	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Bromomethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Carbon disulfide	U	n	0.900	10.0	ug/L	1	26-Jan-2024 07:53
Carbon tetrachloride	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Chlorobenzene	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
Chloroethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Chloroform	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Chloromethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
cis-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Dibromochloromethane	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Dibromomethane	U	n	0.600	5.00	ug/L	1	26-Jan-2024 07:53
Ethylbenzene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Hexachlorobutadiene	U	n	1.00	5.00	ug/L	1	26-Jan-2024 07:53
Methylene chloride	U		1.00	10.0	ug/L	1	26-Jan-2024 07:53
Styrene	U	n	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Tetrachloroethene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Toluene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
trans-1,2-Dichloroethene	U		0.400	5.00	ug/L	1	26-Jan-2024 07:53
trans-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	26-Jan-2024 07:53
Trichloroethene	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	OF-001	Lab ID:HS24011276-01
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES		Method:E624					Analyst: PC
Vinyl acetate	U	n	1.90	10.0	ug/L	1	26-Jan-2024 07:53
Vinyl chloride	U		0.400	2.00	ug/L	1	26-Jan-2024 07:53
Xylenes, Total	U		0.500	5.00	ug/L	1	26-Jan-2024 07:53
Total Trihalomethanes (TTHMs)	U	a	0.500	5.00	ug/L	1	26-Jan-2024 07:53
Surr: 1,2-Dichloroethane-d4	74.4			70-126	%REC	1	26-Jan-2024 07:53
Surr: 4-Bromofluorobenzene	96.4			82-124	%REC	1	26-Jan-2024 07:53
Surr: Dibromofluoromethane	84.5			77-123	%REC	1	26-Jan-2024 07:53
Surr: Toluene-d8	104			82-127	%REC	1	26-Jan-2024 07:53
VOLATILES - SW8260C		Method:SW8260					Analyst: PC
Acetaldehyde	U	n	10	10	ug/L	1	26-Jan-2024 07:53
Propylene oxide	U	n	10	10	ug/L	1	26-Jan-2024 07:53
Surr: 1,2-Dichloroethane-d4	74.4			70-126	%REC	1	26-Jan-2024 07:53
Surr: 4-Bromofluorobenzene	96.4			82-124	%REC	1	26-Jan-2024 07:53
Surr: Dibromofluoromethane	84.5			77-123	%REC	1	26-Jan-2024 07:53
Surr: Toluene-d8	104			82-127	%REC	1	26-Jan-2024 07:53

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Sample ID: OF-001
Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT
WorkOrder:HS24011276
Lab ID:HS24011276-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 24-Jan-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
1,2,4-Trichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
1,2-Dichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
1,2-Diphenylhydrazine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
1,4-Dichlorobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4,5-Trichlorophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
2,4,6-Trichlorophenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dichlorophenol	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dimethylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dinitrophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
2,4-Dinitrotoluene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2,6-Dichlorophenol	U	n	0.400	5.00	ug/L	1	29-Jan-2024 22:23
2,6-Dinitrotoluene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
2-Chloronaphthalene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
2-Chlorophenol	U		1.00	5.00	ug/L	1	29-Jan-2024 22:23
2-Methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
2-Nitrophenol	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
3&4-Methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
3,3'-Dichlorobenzidine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
4,6-Dinitro-2-methylphenol	U		0.900	5.00	ug/L	1	29-Jan-2024 22:23
4-Bromophenyl phenyl ether	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
4-Chloro-3-methylphenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
4-Chlorophenyl phenyl ether	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
4-Nitrophenol	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Acenaphthene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Acenaphthylene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Anthracene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benz(a)anthracene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benzidine	U		5.00	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(a)pyrene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(b)fluoranthene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(g,h,i)perylene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Benzo(k)fluoranthene	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroethoxy)methane	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroethyl)ether	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-chloroisopropyl)ether	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Bis(2-ethylhexyl)phthalate	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Butyl benzyl phthalate	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:ChampionX LLC

Project:2024 Permit Renewal-WK1

Sample ID:OF-001

Collection Date:24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276

Lab ID:HS24011276-01

Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE	Method:E625			Prep:E625 / 24-Jan-2024		Analyst: GEY	
Chrysene	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Di-n-butyl phthalate	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Di-n-octyl phthalate	U		2.00	5.00	ug/L	1	29-Jan-2024 22:23
Dibenz(a,h)anthracene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Diethyl phthalate	U		0.700	5.00	ug/L	1	29-Jan-2024 22:23
Dimethyl phthalate	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Fluoranthene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Fluorene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorobenzene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorobutadiene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Hexachlorocyclopentadiene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Hexachloroethane	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Indeno(1,2,3-cd)pyrene	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
Isophorone	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitroso-di-n-butylamine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodi-n-propylamine	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodiethylamine	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodimethylamine	U		0.600	5.00	ug/L	1	29-Jan-2024 22:23
N-Nitrosodiphenylamine	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Naphthalene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Nitrobenzene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Nonylphenol	U	n	5.00	5.00	ug/L	1	29-Jan-2024 22:23
Pentachlorobenzene	U		0.500	5.00	ug/L	1	29-Jan-2024 22:23
Pentachlorophenol	U		0.800	5.00	ug/L	1	29-Jan-2024 22:23
Phenanthrene	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Phenol	U		0.400	5.00	ug/L	1	29-Jan-2024 22:23
Pyrene	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Pyridine	U		0.300	5.00	ug/L	1	29-Jan-2024 22:23
Cresols, Total	U	n	0.400	5.00	ug/L	1	29-Jan-2024 22:23
Surr: 2,4,6-Tribromophenol	82.6			42-124	%REC	1	29-Jan-2024 22:23
Surr: 2-Fluorobiphenyl	67.1			48-120	%REC	1	29-Jan-2024 22:23
Surr: 2-Fluorophenol	51.0			20-120	%REC	1	29-Jan-2024 22:23
Surr: 4-Terphenyl-d14	76.1			51-135	%REC	1	29-Jan-2024 22:23
Surr: Nitrobenzene-d5	62.4			41-120	%REC	1	29-Jan-2024 22:23
Surr: Phenol-d6	62.4			20-120	%REC	1	29-Jan-2024 22:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Sample ID: OF-001
Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT
WorkOrder:HS24011276
Lab ID:HS24011276-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 30-Jan-2024		Analyst: JBA	
4,4'-DDD	U		0.0000760	0.00250	ug/L	1	01-Feb-2024 23:49
4,4'-DDE	0.000366	J	0.000100	0.00250	ug/L	1	01-Feb-2024 23:49
4,4'-DDT	0.000488	J	0.000145	0.00250	ug/L	1	01-Feb-2024 23:49
Aldrin	U		0.0000340	0.00125	ug/L	1	01-Feb-2024 23:49
alpha-BHC	U		0.00125	0.00125	ug/L	1	01-Feb-2024 23:49
Aroclor 1016	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1221	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1232	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1242	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1248	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1254	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Aroclor 1260	U		0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
beta-BHC	0.000130	J	0.0000430	0.00125	ug/L	1	01-Feb-2024 23:49
Chlordane	U		0.0250	0.0250	ug/L	1	01-Feb-2024 23:49
delta-BHC	U		0.0000290	0.00125	ug/L	1	01-Feb-2024 23:49
Dieldrin	0.000199	J	0.0000530	0.00250	ug/L	1	01-Feb-2024 23:49
Endosulfan I	U		0.0000390	0.00125	ug/L	1	01-Feb-2024 23:49
Endosulfan II	U		0.00250	0.00250	ug/L	1	01-Feb-2024 23:49
Endosulfan sulfate	U		0.0000930	0.00250	ug/L	1	01-Feb-2024 23:49
Endrin	U		0.0000830	0.00250	ug/L	1	01-Feb-2024 23:49
Endrin aldehyde	U		0.000147	0.00250	ug/L	1	01-Feb-2024 23:49
gamma-BHC	U		0.00125	0.00125	ug/L	1	01-Feb-2024 23:49
Heptachlor	U		0.0000450	0.00125	ug/L	1	01-Feb-2024 23:49
Heptachlor epoxide	U		0.0000270	0.00125	ug/L	1	01-Feb-2024 23:49
Toxaphene	U		0.0250	0.0250	ug/L	1	01-Feb-2024 23:49
Total PCBs	U	n	0.0125	0.0125	ug/L	1	01-Feb-2024 16:38
Surr: Decachlorobiphenyl	106			61-154	%REC	1	01-Feb-2024 16:38
Surr: Decachlorobiphenyl	86.6			61-154	%REC	1	01-Feb-2024 23:49
Surr: Tetrachloro-m-xylene	78.5			60-144	%REC	1	01-Feb-2024 23:49
Surr: Tetrachloro-m-xylene	79.0			60-144	%REC	1	01-Feb-2024 16:38
TRIVALENT CHROMIUM		Method:Calculation		Analyst: JHD			
Chromium, Trivalent	0.00100	Jn	0.000251	0.00400	mg/L	1	07-Feb-2024 16:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK1
 Sample ID: OF-001
 Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
 Lab ID:HS24011276-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 31-Jan-2024		Analyst: MSC	
Aluminum	0.239		0.000800	0.0100	mg/L	1	01-Feb-2024 22:10
Antimony	U		0.000530	0.00500	mg/L	1	01-Feb-2024 22:10
Arsenic	0.00154	J	0.000250	0.00200	mg/L	1	01-Feb-2024 22:10
Barium	0.0435		0.0000840	0.00400	mg/L	1	01-Feb-2024 22:10
Beryllium	U		0.0000910	0.00500	mg/L	1	01-Feb-2024 22:10
Cadmium	0.0000810	J	0.0000770	0.00200	mg/L	1	01-Feb-2024 22:10
Chromium	0.00127	J	0.000251	0.00400	mg/L	1	01-Feb-2024 22:10
Copper	0.00452		0.000170	0.00200	mg/L	1	01-Feb-2024 22:10
Lead	0.0376		0.000120	0.00200	mg/L	1	01-Feb-2024 22:10
Nickel	0.00284		0.000110	0.00200	mg/L	1	01-Feb-2024 22:10
Selenium	U		0.000860	0.00200	mg/L	1	01-Feb-2024 22:10
Silver	0.0000710	J	0.0000440	0.00200	mg/L	1	01-Feb-2024 22:10
Thallium	U		0.000250	0.00200	mg/L	1	01-Feb-2024 22:10
Zinc	0.0257		0.00100	0.00400	mg/L	1	01-Feb-2024 22:10
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	2.61		0.610	2.00	mg/L	1	02-Feb-2024 07:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	0.363		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Chloride	8.97		0.200	0.500	mg/L	1	24-Jan-2024 20:53
Fluoride	U		0.0500	0.100	mg/L	1	24-Jan-2024 20:53
Nitrogen, Nitrate (As N)	0.300		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Nitrogen, Nitrite (As N)	U		0.0300	0.100	mg/L	1	24-Jan-2024 20:53
Sulfate	7.24		0.200	0.500	mg/L	1	24-Jan-2024 20:53
Nitrate/Nitrite (as N)	0.300		0.0300	0.200	mg/L	1	24-Jan-2024 20:53
SULFIDE BY E376.1		Method:E376.1				Analyst: CD	
Sulfide	U		1.70	2.00	mg/L	1	31-Jan-2024 15:13
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	22.0		5.00	15.0	mg/L	1	02-Feb-2024 16:30
TOTAL DISSOLVED SOLIDS BY SM2540C-2011		Method:M2540C				Analyst: JAC	
Total Dissolved Solids (Residue, Filterable)	96.0		5.00	10.0	mg/L	1	31-Jan-2024 13:00
TOTAL SUSPENDED SOLIDS BY SM2540D-2011		Method:M2540D				Analyst: JAC	
Suspended Solids (Residue, Non-Filterable)	10.2		2.00	2.00	mg/L	1	31-Jan-2024 11:00
ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011		Method:M4500 NH3 D				Analyst: MZD	
Nitrogen, Organic	U		0.50	0.50	mg/L	1	07-Feb-2024 15:50
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011		Method:M4500 NH3 D		Prep:M4500-N C / 30-Jan-2024		Analyst: MZD	
Nitrogen, Total Kjeldahl	4.9		0.10	0.50	mg/L	1	31-Jan-2024 10:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK1
Sample ID: OF-001
Collection Date: 24-Jan-2024 10:08

ANALYTICAL REPORT

WorkOrder:HS24011276
Lab ID:HS24011276-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CYANIDE BY SM 4500CN E&G-2011		Method:M4500CN EG		Prep:M4500CN E&G / 31-Jan-2024		Analyst: MZD	
Cyanide	0.00200	J	0.00200	0.00500	mg/L	1	01-Feb-2024 12:12
DISSOLVED OXYGEN BY SM4500-O G		Method:M4500-O G				Analyst: DW	
Oxygen, Dissolved	6.43	H	1.00	1.00	mg/L	1	01-Feb-2024 14:45
COLOR BY SM 2120B - 2011		Method:SM2120B				Analyst: JAC	
Color, Apparent	75.0		25.0	25.0	Color Units	5	26-Jan-2024 09:30
ALKALINITY BY -2011		Method:SM2320B				Analyst: DW	
Alkalinity, Total (As CaCO3)	37.8		2.50	5.00	mg/L	1	07-Feb-2024 13:16
AMMONIA AS N BY SM4500 NH3-B-F-2011		Method:SM4500 NH3-B-F		Prep:M4500-NH3 B / 01-Feb-2024		Analyst: JAC	
Nitrogen, Ammonia (as N)	5.7		0.62	1.2	mg/L	1	02-Feb-2024 11:08
RESIDUAL CHLORINE BY SM4500CL F-2011		Method:SM4500CL F				Analyst: MC	
Chlorine	U	H	0.10	0.10	mg/L	1	02-Feb-2024 13:35
PH BY SM4500H+ B-2011		Method:SM4500H+ B				Analyst: DW	
pH	6.80	H	0.100	0.100	pH Units	1	06-Feb-2024 13:40
Temp Deg C @pH	12.8	H	0	0	°C	1	06-Feb-2024 13:40
PHOSPHORUS BY SM4500P E-2011		Method:SM4500P E		Prep:SM4500P E / 07-Feb-2024		Analyst: MZD	
Phosphorus, Total (As P)	0.0340	J	0.0200	0.0500	mg/L	1	07-Feb-2024 14:13
SULFITE BY SM4500SO3B		Method:SM4500SO3B				Analyst: MC	
Sulfite	U	H	5.00	5.00	mg/L	1	05-Feb-2024 16:36
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011		Method:SM5210 B		Prep:SM5210 B / 25-Jan-2024		Analyst: DW	
Biochemical Oxygen Demand	2.79		2.00	2.00	mg/L	1	30-Jan-2024 15:31
CBOD BY SM5210B-2011		Method:SM5210 B		Prep:SM5210 B / 25-Jan-2024		Analyst: DW	
Carbonaceous Biochemical Oxygen Demand	2.28		2.00	2.00	mg/L	1	30-Jan-2024 16:53
TOTAL ORGANIC CARBON - SM5310B-2011		Method:SM5310B				Analyst: DW	
Organic Carbon, Total	8.19		0.500	1.00	mg/L	1	30-Jan-2024 04:06
SURFACTANTS (MBAS) BY SM5540C		Method:SM5540C		Prep:SM5540C / 26-Jan-2024		Analyst: MZD	
MBAS	0.0880		0.00800	0.0500	mg/L 340 MW LAS	1	26-Jan-2024 09:30
SUBCONTRACT HEXAVALENT CHROMIUM		Method:E218.6				Analyst: SUB	
Chromium, Hexavalent	See Attached		0		UG/L	1	31-Jan-2024 15:03
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667		Method:NA				Analyst: SUBHO	
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45
SUBCONTRACT ANALYSIS - E. COLI		Method:NA				Analyst: EDL	
Subcontract Analysis	See Attached		0			1	29-Jan-2024 12:46
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA				Analyst: EDL	
Subcontract Analysis	See Attached		0			1	29-Jan-2024 12:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	OF-001	Lab ID:HS24011276-01
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0			1	31-Jan-2024 10:21
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA				Analyst: SUBHO	
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	Field Duplicate	Lab ID:HS24011276-02
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY LOW			Method:NA				Analyst: SUBHO
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK1	WorkOrder:HS24011276
Sample ID:	Field Blank	Lab ID:HS24011276-03
Collection Date:	24-Jan-2024 10:08	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	07-Feb-2024 11:45



10450 Stancliff Rd. Suite 210
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February 14, 2024

Andy Slater
ChampionX LLC
PO Box 2167
Freeport, TX 77542

Work Order: **HS24011577**

Laboratory Results for: **2024 Permit Renewal-WK2**

Dear Andy Slater,

ALS Environmental received 3 sample(s) on Jan 29, 2024 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Andy C. Neir

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Work Order: HS24011577

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24011577-01	OF001 WK 2	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>
HS24011577-02	LL Hg Duplicate	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>
HS24011577-03	LL Hg Field Blank	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Work Order: HS24011577

CASE NARRATIVE**Work Order Comments**

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.
Sample received outside method holding time for Sulfite. Sulfite is an immediate test. Sample results are flagged with an "H" qualifier.
Chlorine and Oxygen dissolved are immediate tests. Samples are flagged with "H" qualifier.
- The analyses for Available Cyanide and Mercury Low were subcontracted to ALS Environmental in Holland, MI. The analysis for BTU was subcontracted to ALS Environmental in Holland, MI. Final report attached.
- The analyses for E.coli, Enterococci and Formaldehyde were subcontracted to Envirodyne Laboratories, Inc. in Houston, TX. Final report attached.
- The analysis for Hexavalent Chromium was subcontracted to Pace Analytical in Mount Juliet TN. Final report attached
- The analysis for Amines was subcontracted to SPL in Kilgore TX. Final report attached

ECD Organics by Method E608**Batch ID: 206672****Sample ID: LCS-206672**

- The multi-response compounds toxaphene and chlordane were not included in the spiking solution for the LCS/LCSD.

Sample ID: MBLK-206672

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.

GCMS Semivolatiles by Method E625**Batch ID: 206645****Sample ID: LCSD-206645**

- The RPD between the LCS and LCSD was outside of the control limit.

GCMS Volatiles by Method E624**Batch ID: R457633****Sample ID: HS24011610-04MS**

- MS and MSD are for an unrelated sample

Batch ID: R457755**Sample ID: VLCSW-240131**

- Insufficient sample received to perform MS/MSD. An LCS/LCSD was performed as batch quality control.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Work Order: HS24011577

CASE NARRATIVE

Metals by Method E200.8**Batch ID: 206751****Sample ID: HS24011503-01MS**

- MS and MSD are for an unrelated sample

Sample ID: HS24011700-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method E300**Batch ID: R458442****Sample ID: OF001 WK 2 (HS24011577-01)**

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrite (As N))

Batch ID: R457584**Sample ID: HS24011587-01MS**

- MS and MSD are for an unrelated sample

WetChemistry by Method SM4500CL F**Batch ID: R457906**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E1664A**Batch ID: R458033**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500SO3B**Batch ID: R458055**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4**Batch ID: R458205**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B**Batch ID: R458405**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500H+ B**Batch ID: R458407**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Work Order: HS24011577

CASE NARRATIVE

WetChemistry by Method SM4500H+ B

WetChemistry by Method SM5310B

Batch ID: R458335

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540C

Batch ID: R458101

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 S2-F

Batch ID: R458046

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540D

Batch ID: R457940

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500-O G

Batch ID: R457806

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2120B

Batch ID: R457570

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500CN EG

Batch ID: 206762

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500 NH3 D

Batch ID: 207188,R458827

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 NH3-B-F

Batch ID: 207171

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Work Order: HS24011577

CASE NARRATIVE

WetChemistry by Method SM5540C

Batch ID: 206735

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5210 B

Batch ID: 206637,206638

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624			Analyst: TS	
1,1,1-Trichloroethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,1,2,2-Tetrachloroethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,1,2-Trichloroethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,1-Dichloroethane	U		0.000400	0.00500	mg/L	1	30-Jan-2024 13:14
1,1-Dichloroethene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,2-Dibromoethane	U		0.000400	0.00500	mg/L	1	30-Jan-2024 13:14
1,2-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
1,2-Dichloroethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,2-Dichloropropane	U		0.000700	0.00500	mg/L	1	30-Jan-2024 13:14
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
1,4-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
2-Butanone	U		0.00100	0.0100	mg/L	1	30-Jan-2024 13:14
2-Chloroethyl vinyl ether	U		0.00130	0.0100	mg/L	1	30-Jan-2024 13:14
Acetonitrile	U	n	0.0250	0.0500	mg/L	1	30-Jan-2024 13:14
Acrolein	U		0.00400	0.0200	mg/L	1	30-Jan-2024 13:14
Acrylonitrile	U		0.00400	0.0100	mg/L	1	30-Jan-2024 13:14
Benzene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Benzyl Chloride	U	n	0.000500	0.00500	mg/L	1	31-Jan-2024 20:40
Bromodichloromethane	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Bromoform	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Bromomethane	0.00233	J	0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Carbon disulfide	U	n	0.000900	0.0100	mg/L	1	30-Jan-2024 13:14
Carbon tetrachloride	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Chlorobenzene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 13:14
Chloroethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Chloroform	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Chloromethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
cis-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Dibromochloromethane	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Dibromomethane	U	n	0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Ethylbenzene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Hexachlorobutadiene	U	n	0.00100	0.00500	mg/L	1	30-Jan-2024 13:14
Methylene chloride	U		0.00100	0.0100	mg/L	1	30-Jan-2024 13:14
Styrene	U	n	0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Tetrachloroethene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Toluene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
trans-1,2-Dichloroethene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 13:14
trans-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 13:14
Trichloroethene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	OF001 WK 2	Lab ID:HS24011577-01
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES	Method:E624						Analyst: TS
Vinyl chloride	U		0.000400	0.00200	mg/L	1	30-Jan-2024 13:14
Xylenes, Total	U		0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Total Trihalomethanes (TTHMs)	U	a	0.000500	0.00500	mg/L	1	30-Jan-2024 13:14
Surr: 1,2-Dichloroethane-d4	112			70-126	%REC	1	30-Jan-2024 13:14
Surr: 1,2-Dichloroethane-d4	76.9			70-126	%REC	1	31-Jan-2024 20:40
Surr: 4-Bromofluorobenzene	96.9			82-124	%REC	1	30-Jan-2024 13:14
Surr: 4-Bromofluorobenzene	98.4			82-124	%REC	1	31-Jan-2024 20:40
Surr: Dibromofluoromethane	107			77-123	%REC	1	30-Jan-2024 13:14
Surr: Dibromofluoromethane	79.4			77-123	%REC	1	31-Jan-2024 20:40
Surr: Toluene-d8	98.0			82-127	%REC	1	30-Jan-2024 13:14
Surr: Toluene-d8	98.9			82-127	%REC	1	31-Jan-2024 20:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 30-Jan-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
1,2,4-Trichlorobenzene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
1,2-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
1,2-Diphenylhydrazine	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
1,4-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
2,4,5-Trichlorophenol	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
2,4,6-Trichlorophenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
2,4-Dichlorophenol	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
2,4-Dimethylphenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
2,4-Dinitrophenol	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
2,4-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
2,6-Dichlorophenol	U	n	0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
2,6-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
2-Chloronaphthalene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
2-Chlorophenol	U		0.00100	0.00500	mg/L	1	30-Jan-2024 21:36
2-Methylphenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
2-Nitrophenol	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
3&4-Methylphenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
3,3'-Dichlorobenzidine	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
4,6-Dinitro-2-methylphenol	U		0.000900	0.00500	mg/L	1	30-Jan-2024 21:36
4-Bromophenyl phenyl ether	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
4-Chloro-3-methylphenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
4-Chlorophenyl phenyl ether	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
4-Nitrophenol	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
Acenaphthene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Acenaphthylene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Anthracene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Benz(a)anthracene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Benzidine	U		0.00500	0.00500	mg/L	1	30-Jan-2024 21:36
Benzo(a)pyrene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Benzo(b)fluoranthene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Benzo(g,h,i)perylene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Benzo(k)fluoranthene	U		0.000700	0.00500	mg/L	1	30-Jan-2024 21:36
Bis(2-chloroethoxy)methane	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Bis(2-chloroethyl)ether	U		0.000700	0.00500	mg/L	1	30-Jan-2024 21:36
Bis(2-chloroisopropyl)ether	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Bis(2-ethylhexyl)phthalate	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Butyl benzyl phthalate	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 30-Jan-2024		Analyst: GEY	
Chrysene	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Dibenz(a,h)anthracene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
Diethyl phthalate	U		0.000700	0.00500	mg/L	1	30-Jan-2024 21:36
Dimethyl phthalate	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
Di-n-butyl phthalate	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Di-n-octyl phthalate	U		0.00200	0.00500	mg/L	1	30-Jan-2024 21:36
Fluoranthene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Fluorene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
Hexachlorobenzene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Hexachlorobutadiene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
Hexachlorocyclopentadiene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Hexachloroethane	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
Isophorone	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
Naphthalene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Nitrobenzene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
N-Nitrosodiethylamine	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
N-Nitrosodimethylamine	U		0.000600	0.00500	mg/L	1	30-Jan-2024 21:36
N-Nitroso-di-n-butylamine	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
N-Nitrosodi-n-propylamine	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
N-Nitrosodiphenylamine	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Nonylphenol	U	n	0.00500	0.00500	mg/L	1	30-Jan-2024 21:36
Pentachlorobenzene	U		0.000500	0.00500	mg/L	1	30-Jan-2024 21:36
Pentachlorophenol	U		0.000800	0.00500	mg/L	1	30-Jan-2024 21:36
Phenanthrene	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Phenol	U		0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Pyrene	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Pyridine	U		0.000300	0.00500	mg/L	1	30-Jan-2024 21:36
Cresols, Total	U	n	0.000400	0.00500	mg/L	1	30-Jan-2024 21:36
Surr: 2,4,6-Tribromophenol	83.5			42-124	%REC	1	30-Jan-2024 21:36
Surr: 2-Fluorobiphenyl	68.1			48-120	%REC	1	30-Jan-2024 21:36
Surr: 2-Fluorophenol	50.5			20-120	%REC	1	30-Jan-2024 21:36
Surr: 4-Terphenyl-d14	76.0			51-135	%REC	1	30-Jan-2024 21:36
Surr: Nitrobenzene-d5	57.2			41-120	%REC	1	30-Jan-2024 21:36
Surr: Phenol-d6	67.3			20-120	%REC	1	30-Jan-2024 21:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 30-Jan-2024		Analyst: JBA	
4,4'-DDD	U		0.0000760	0.00250	UG/L	1	02-Feb-2024 00:10
4,4'-DDE	U		0.000100	0.00250	UG/L	1	02-Feb-2024 00:10
4,4'-DDT	U		0.000145	0.00250	UG/L	1	02-Feb-2024 00:10
Aldrin	0.000257	J	0.0000340	0.00125	UG/L	1	02-Feb-2024 00:10
alpha-BHC	U		0.00125	0.00125	UG/L	1	02-Feb-2024 00:10
Aroclor 1016	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1221	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1232	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1242	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1248	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1254	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1260	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
beta-BHC	0.000687	J	0.0000430	0.00125	UG/L	1	02-Feb-2024 00:10
Chlordane	U		0.0250	0.0250	UG/L	1	02-Feb-2024 00:10
delta-BHC	U		0.0000290	0.00125	UG/L	1	02-Feb-2024 00:10
Dieldrin	U		0.0000530	0.00250	UG/L	1	02-Feb-2024 00:10
Endosulfan I	U		0.0000390	0.00125	UG/L	1	02-Feb-2024 00:10
Endosulfan II	U		0.00250	0.00250	UG/L	1	02-Feb-2024 00:10
Endosulfan sulfate	U		0.0000930	0.00250	UG/L	1	02-Feb-2024 00:10
Endrin	U		0.0000830	0.00250	UG/L	1	02-Feb-2024 00:10
Endrin aldehyde	U		0.000147	0.00250	UG/L	1	02-Feb-2024 00:10
gamma-BHC	U		0.00125	0.00125	UG/L	1	02-Feb-2024 00:10
Heptachlor	0.000123	J	0.0000450	0.00125	UG/L	1	02-Feb-2024 00:10
Heptachlor epoxide	U		0.0000270	0.00125	UG/L	1	02-Feb-2024 00:10
Toxaphene	U		0.0250	0.0250	UG/L	1	02-Feb-2024 00:10
Total PCBs	U	n	0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
<i>Surr: Decachlorobiphenyl</i>	<i>107</i>			<i>61-154</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2024 16:51</i>
<i>Surr: Decachlorobiphenyl</i>	<i>102</i>			<i>61-154</i>	<i>%REC</i>	<i>1</i>	<i>02-Feb-2024 00:10</i>
<i>Surr: Tetrachloro-m-xylene</i>	<i>80.0</i>			<i>60-144</i>	<i>%REC</i>	<i>1</i>	<i>02-Feb-2024 00:10</i>
<i>Surr: Tetrachloro-m-xylene</i>	<i>107</i>			<i>60-144</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2024 16:51</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 31-Jan-2024		Analyst: MSC	
Aluminum	0.0436		0.000800	0.0100	mg/L	1	06-Feb-2024 16:42
Antimony	0.00108	J	0.000530	0.00500	mg/L	1	05-Feb-2024 23:24
Arsenic	0.000766	J	0.000250	0.00200	mg/L	1	05-Feb-2024 23:24
Barium	0.0346		0.0000840	0.00400	mg/L	1	05-Feb-2024 23:24
Beryllium	U		0.0000910	0.00500	mg/L	1	05-Feb-2024 23:24
Boron	0.0208		0.0167	0.0200	mg/L	1	05-Feb-2024 23:24
Cadmium	U		0.0000770	0.00200	mg/L	1	05-Feb-2024 23:24
Chromium	0.000406	J	0.000251	0.00400	mg/L	1	05-Feb-2024 23:24
Cobalt	0.000196	J	0.0000400	0.00500	mg/L	1	05-Feb-2024 23:24
Copper	0.00225		0.000170	0.00200	mg/L	1	05-Feb-2024 23:24
Iron	0.573		0.0500	0.200	mg/L	1	05-Feb-2024 23:24
Lead	0.000349	J	0.000120	0.00200	mg/L	1	05-Feb-2024 23:24
Magnesium	5.99		0.00780	0.500	mg/L	1	05-Feb-2024 23:24
Manganese	0.0384		0.0000660	0.00500	mg/L	1	05-Feb-2024 23:24
Molybdenum	0.0436		0.000490	0.00500	mg/L	1	05-Feb-2024 23:24
Nickel	0.00102	J	0.000110	0.00200	mg/L	1	05-Feb-2024 23:24
Selenium	U		0.000860	0.00200	mg/L	1	05-Feb-2024 23:24
Silver	U		0.0000440	0.00200	mg/L	1	05-Feb-2024 23:24
Thallium	U		0.000250	0.00200	mg/L	1	05-Feb-2024 23:24
Tin	0.000142	J	0.0000580	0.00500	mg/L	1	05-Feb-2024 23:24
Titanium	0.000438	J	0.000390	0.00500	mg/L	1	05-Feb-2024 23:24
Zinc	0.0253		0.00100	0.00400	mg/L	1	05-Feb-2024 23:24
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	2.33		0.610	2.00	mg/L	1	05-Feb-2024 10:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	1.87		0.0300	0.100	mg/L	1	30-Jan-2024 12:50
Chloride	59.4		0.200	0.500	mg/L	1	30-Jan-2024 12:50
Fluoride	1.62		0.0500	0.100	mg/L	1	30-Jan-2024 12:50
Nitrogen, Nitrate (As N)	4.99		0.0300	0.100	mg/L	1	30-Jan-2024 12:50
Sulfate	36.9		0.200	0.500	mg/L	1	30-Jan-2024 12:50
NITRATE/NITRITE BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Nitrate/Nitrite (as N)	7.81		0.300	2.00	mg/L	10	09-Feb-2024 07:48
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	97.0		5.00	15.0	mg/L	1	07-Feb-2024 10:30
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		Method:M2540C				Analyst: JAC	
Total Dissolved Solids (Residue, Filterable)	270		5.00	10.0	mg/L	1	05-Feb-2024 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK2
 Sample ID: OF001 WK 2
 Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
 Lab ID:HS24011577-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL SUSPENDED SOLIDS BY SM 2540D-2011 Method:M2540D							Analyst: JAC
Suspended Solids (Residue, Non-Filterable)	14.4		2.00	2.00	mg/L	1	02-Feb-2024 13:00
ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011 Method:M4500 NH3 D							Analyst: MZD
Nitrogen, Organic	18		0.50	0.50	mg/L	1	14-Feb-2024 17:55
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011 Method:M4500 NH3 D							Prep:M4500-N C / 08-Feb-2024 Analyst: MZD
Nitrogen, Total Kjeldahl	56		0.10	0.50	mg/L	1	09-Feb-2024 15:00
CYANIDE BY SM 4500CN E&G-2011 Method:M4500CN EG							Prep:M4500CN E&G / 31-Jan-2024 Analyst: MZD
Cyanide	0.00300	J	0.00200	0.00500	mg/L	1	01-Feb-2024 12:12
DISSOLVED OXYGEN BY SM4500-O G Method:M4500-O G							Analyst: DW
Oxygen, Dissolved	6.01	H	1.00	1.00	mg/L	1	01-Feb-2024 14:45
COLOR BY SM 2120B - 2011 Method:SM2120B							Analyst: JAC
Color, Apparent	35.0		5.00	5.00	Color Units	1	30-Jan-2024 18:05
ALKALINITY BY -2011 Method:SM2320B							Analyst: DW
Alkalinity, Total (As CaCO3)	213		2.50	5.00	mg/L	1	08-Feb-2024 16:31
AMMONIA AS N BY SM4500 NH3-B-F-2011 Method:SM4500 NH3-B-F							Prep:M4500-NH3 B / 09-Feb-2024 Analyst: MZD
Nitrogen, Ammonia (as N)	38		3.1	6.2	mg/L	5	09-Feb-2024 17:00
SULFIDE BY SM4500 S2-F-2011 Method:SM4500 S2-F							Analyst: CD
Sulfide	U		1.70	2.00	mg/L	1	05-Feb-2024 16:20
RESIDUAL CHLORINE BY SM4500CL F-2011 Method:SM4500CL F							Analyst: MC
Chlorine	U	H	0.10	0.10	mg/L	1	02-Feb-2024 13:35
PH BY SM4500H+ B-2011 Method:SM4500H+ B							Analyst: DW
pH	7.94	H	0.100	0.100	pH Units	1	08-Feb-2024 16:31
Temp Deg C @pH	19.4	H	0	0	°C	1	08-Feb-2024 16:31
SULFITE BY SM4500SO3B Method:SM4500SO3B							Analyst: MC
Sulfite	U	H	5.00	5.00	mg/L	1	05-Feb-2024 16:36
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 29-Jan-2024 Analyst: JAC
Biochemical Oxygen Demand	U		2.00	2.00	mg/L	1	03-Feb-2024 12:43
CBOD BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 29-Jan-2024 Analyst: JAC
Carbonaceous Biochemical Oxygen Demand	U		2.00	2.00	mg/L	1	03-Feb-2024 12:45
TOTAL ORGANIC CARBON - SM5310B-2011 Method:SM5310B							Analyst: DW
Organic Carbon, Total	3.76		0.500	1.00	mg/L	1	08-Feb-2024 01:03
SURFACTANTS (MBAS) BY SM5540C Method:SM5540C							Prep:SM5540C / 30-Jan-2024 Analyst: MZD
MBAS	0.0610		0.00800	0.0500	mg/L 340 MW LAS	1	30-Jan-2024 16:29
SUBCONTRACT HEXAVALENT CHROMIUM Method:E218.6							Analyst: SUB
Chromium, Hexavalent	See Attached		0		UG/L	1	31-Jan-2024 15:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	OF001 WK 2	Lab ID:HS24011577-01
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - AMINES		Method:NA		Analyst: SUB			
Subcontract Analysis	0		0	0	NA	1	08-Feb-2024 18:37
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06
SUBCONTRACT ANALYSIS - E. COLI		Method:NA		Analyst: SUB			
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA		Analyst: SUB			
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA		Analyst: SUB			
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	LL Hg Duplicate	Lab ID:HS24011577-02
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	LL Hg Field Blank	Lab ID:HS24011577-03
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

Batch ID: 206637		Start Date: 29 Jan 2024 15:00		End Date: 29 Jan 2024 15:00	
Method: WETCHEMPREP, BOD				Prep Code: BOD_PR 5210B	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206638		Start Date: 29 Jan 2024 15:00		End Date: 29 Jan 2024 15:00	
Method: CBOD PREP				Prep Code: CBOD_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206645		Start Date: 30 Jan 2024 08:25		End Date: 30 Jan 2024 08:25	
Method: 625 AQ SEP FUNNEL EXTRACTION				Prep Code: 625PRF	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Sodium thiosulfate

Batch ID: 206672		Start Date: 30 Jan 2024 11:42		End Date: 30 Jan 2024 11:42	
Method: AQPREP SEP FUNNEL: PEST/PCB				Prep Code: 608_W_LOWPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Neat

Batch ID: 206735		Start Date: 30 Jan 2024 14:00		End Date: 30 Jan 2024 14:00	
Method: MBAS - PREPARATION				Prep Code: MBAS_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		400 (mL)	400 (mL)	1	1-L plastic, Neat

Batch ID: 206751		Start Date: 31 Jan 2024 10:00		End Date: 31 Jan 2024 10:00	
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994				Prep Code: 200.8PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 206762		Start Date: 31 Jan 2024 09:00		End Date: 31 Jan 2024 09:00	
Method: CYANIDE PREP - SM4500CN-2011				Prep Code: CN_TW4500_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		50 (mL)	50 (mL)	1	250 mL plastic, NaOH/ASE

Batch ID: 207171		Start Date: 09 Feb 2024 09:00		End Date: 09 Feb 2024 09:00	
Method: NITROGEN AMMONIA - WATER - PREP				Prep Code: NIT_AMM_W_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		1 (mL)	25 (mL)	25	1-liter amber glass, H2SO4 to pH <2

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

Batch ID: 207188	Start Date: 08 Feb 2024 12:30	End Date: 08 Feb 2024 12:30
Method: TKN WATER - PREP	Prep Code: TKN_W_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24011577-01		25 (mL)	50 (mL)	2	1-liter amber glass, H2SO4 to pH <2

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 206637 (0)		Test Name : BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		29 Jan 2024 15:00	03 Feb 2024 12:43	1
Batch ID: 206638 (0)		Test Name : CBOD BY SM5210B-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		29 Jan 2024 15:00	03 Feb 2024 12:45	1
Batch ID: 206645 (0)		Test Name : SEMIVOLATILE			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		30 Jan 2024 08:25	30 Jan 2024 21:36	1
Batch ID: 206672 (0)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		30 Jan 2024 11:42	02 Feb 2024 00:10	1
Batch ID: 206672 (1)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		30 Jan 2024 11:42	01 Feb 2024 16:51	1
Batch ID: 206735 (0)		Test Name : SURFACTANTS (MBAS) BY SM5540C			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		30 Jan 2024 14:00	30 Jan 2024 16:29	1
Batch ID: 206751 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		31 Jan 2024 10:00	06 Feb 2024 16:42	1
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		31 Jan 2024 10:00	05 Feb 2024 23:24	1
Batch ID: 206762 (0)		Test Name : CYANIDE BY SM 4500CN E&G-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		31 Jan 2024 09:00	01 Feb 2024 12:12	1
Batch ID: 207171 (0)		Test Name : AMMONIA AS N BY SM4500 NH3-B-F-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		09 Feb 2024 09:00	09 Feb 2024 17:00	5
Batch ID: 207188 (0)		Test Name : TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46		08 Feb 2024 12:30	09 Feb 2024 15:00	1
Batch ID: R457570 (0)		Test Name : COLOR BY SM 2120B - 2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			30 Jan 2024 18:05	1
Batch ID: R457584 (0)		Test Name : ANIONS BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			30 Jan 2024 12:50	1
Batch ID: R457633 (0)		Test Name : VOLATILES			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			30 Jan 2024 13:14	1
Batch ID: R457690 (0)		Test Name : SUBCONTRACT HEXAVALENT CHROMIUM			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			31 Jan 2024 15:03	1
Batch ID: R457755 (0)		Test Name : VOLATILES			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			31 Jan 2024 20:40	1
Batch ID: R457806 (0)		Test Name : DISSOLVED OXYGEN BY SM4500-O G			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			01 Feb 2024 14:45	1
Batch ID: R457906 (0)		Test Name : RESIDUAL CHLORINE BY SM4500CL F-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			02 Feb 2024 13:35	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R457940 (0)		Test Name : TOTAL SUSPENDED SOLIDS BY SM 2540D-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			02 Feb 2024 13:00	1
Batch ID: R458005 (0)		Test Name : SUBCONTRACT ANALYSIS - FORMALDEHYDE			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 11:52	1
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 11:52	1
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 11:52	1
Batch ID: R458033 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 10:00	1
Batch ID: R458046 (0)		Test Name : SULFIDE BY SM4500 S2-F-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 16:20	1
Batch ID: R458055 (0)		Test Name : SULFITE BY SM4500SO3B			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 16:36	1
Batch ID: R458101 (0)		Test Name : TOTAL DISSOLVED SOLIDS BY SM2540C-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			05 Feb 2024 13:00	1
Batch ID: R458205 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			07 Feb 2024 10:30	1
Batch ID: R458335 (0)		Test Name : TOTAL ORGANIC CARBON - SM5310B-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			08 Feb 2024 01:03	1
Batch ID: R458405 (0)		Test Name : ALKALINITY BY -2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			08 Feb 2024 16:31	1
Batch ID: R458407 (0)		Test Name : PH BY SM4500H+ B-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			08 Feb 2024 16:31	1
Batch ID: R458442 (0)		Test Name : NITRATE/NITRITE BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			09 Feb 2024 07:48	10
Batch ID: R458555 (0)		Test Name : SUBCONTRACT ANALYSIS - MERCURY LOW			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			12 Feb 2024 12:06	1
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			12 Feb 2024 12:06	1
HS24011577-02	LL Hg Duplicate	29 Jan 2024 06:46			12 Feb 2024 12:06	1
HS24011577-03	LL Hg Field Blank	29 Jan 2024 06:46			12 Feb 2024 12:06	1
Batch ID: R458598 (0)		Test Name : SUBCONTRACT ANALYSIS - AMINES			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			08 Feb 2024 18:37	1
Batch ID: R458827 (0)		Test Name : ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011			Matrix: Water	
HS24011577-01	OF001 WK 2	29 Jan 2024 06:46			14 Feb 2024 17:55	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608						
MBLK	Sample ID: MBLK-206672	Units: UG/L		Analysis Date: 01-Feb-2024 22:46						
Client ID:	Run ID: ECD_11_457851		SeqNo: 7810283		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4'-DDD	U	0.00250								
4,4'-DDE	U	0.00250								
4,4'-DDT	U	0.00250								
Aldrin	U	0.00125								
alpha-BHC	U	0.00125								
beta-BHC	U	0.00125								
Chlordane	U	0.0250								
delta-BHC	U	0.00125								
Dieldrin	U	0.00250								
Endosulfan I	U	0.00125								
Endosulfan II	U	0.00250								
Endosulfan sulfate	U	0.00250								
Endrin	U	0.00250								
Endrin aldehyde	U	0.00250								
gamma-BHC	U	0.00125								
Heptachlor	U	0.00125								
Heptachlor epoxide	U	0.00125								
Toxaphene	U	0.0250								
Surr: Decachlorobiphenyl	0.0198	0	0.02	0	99.0	61 - 154				
Surr: Tetrachloro-m-xylene	0.02037	0	0.02	0	102	60 - 144				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608					
LCS		Sample ID: LCS-206672		Units: UG/L		Analysis Date: 01-Feb-2024 22:04			
Client ID:		Run ID: ECD_11_457851		SeqNo: 7810281		PrepDate: 30-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.03965	0.00250	0.05	0	79.3	53 - 144			
4,4'-DDE	0.03827	0.00250	0.05	0	76.5	55 - 144			
4,4'-DDT	0.03341	0.00250	0.05	0	66.8	53 - 149			
Aldrin	0.01768	0.00125	0.025	0	70.7	47 - 141			
alpha-BHC	0.01846	0.00125	0.025	0	73.9	51 - 141			
beta-BHC	0.01896	0.00125	0.025	0	75.8	58 - 144			
delta-BHC	0.01806	0.00125	0.025	0	72.2	48 - 146			
Dieldrin	0.03887	0.00250	0.05	0	77.7	56 - 144			
Endosulfan I	0.01757	0.00125	0.025	0	70.3	55 - 141			
Endosulfan II	0.03489	0.00250	0.05	0	69.8	57 - 144			
Endosulfan sulfate	0.0377	0.00250	0.05	0	75.4	58 - 145			
Endrin	0.03233	0.00250	0.05	0	64.7	60 - 163			
Endrin aldehyde	0.04166	0.00250	0.05	0	83.3	59 - 158			
gamma-BHC	0.01914	0.00125	0.025	0	76.6	53 - 142			
Heptachlor	0.01819	0.00125	0.025	0	72.8	51 - 144			
Heptachlor epoxide	0.01823	0.00125	0.025	0	72.9	55 - 142			
Surr: Decachlorobiphenyl	0.01451	0	0.02	0	72.6	61 - 154			
Surr: Tetrachloro-m-xylene	0.01476	0	0.02	0	73.8	60 - 144			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206672 (0)		Instrument: ECD_11		Method: CHLORINATED PEST/PCBS BY E608					
LCSD		Sample ID: LCSD-206672		Units: UG/L		Analysis Date: 01-Feb-2024 22:25			
Client ID:		Run ID: ECD_11_457851		SeqNo: 7810282		PrepDate: 30-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.04157	0.00250	0.05	0	83.1	53 - 144	0.03965	4.73	20
4,4'-DDE	0.04018	0.00250	0.05	0	80.4	55 - 144	0.03827	4.88	20
4,4'-DDT	0.03506	0.00250	0.05	0	70.1	53 - 149	0.03341	4.81	20
Aldrin	0.01852	0.00125	0.025	0	74.1	47 - 141	0.01768	4.64	20
alpha-BHC	0.01954	0.00125	0.025	0	78.2	51 - 141	0.01846	5.67	20
beta-BHC	0.01986	0.00125	0.025	0	79.4	58 - 144	0.01896	4.65	20
delta-BHC	0.0191	0.00125	0.025	0	76.4	48 - 146	0.01806	5.58	20
Dieldrin	0.04072	0.00250	0.05	0	81.4	56 - 144	0.03887	4.66	20
Endosulfan I	0.01839	0.00125	0.025	0	73.6	55 - 141	0.01757	4.58	20
Endosulfan II	0.03709	0.00250	0.05	0	74.2	57 - 144	0.03489	6.11	20
Endosulfan sulfate	0.03992	0.00250	0.05	0	79.8	58 - 145	0.0377	5.71	20
Endrin	0.03551	0.00250	0.05	0	71.0	60 - 163	0.03233	9.39	20
Endrin aldehyde	0.04346	0.00250	0.05	0	86.9	59 - 158	0.04166	4.23	20
gamma-BHC	0.02037	0.00125	0.025	0	81.5	53 - 142	0.01914	6.25	20
Heptachlor	0.01928	0.00125	0.025	0	77.1	51 - 144	0.01819	5.82	20
Heptachlor epoxide	0.01917	0.00125	0.025	0	76.7	55 - 142	0.01823	5.03	20
Surr: Decachlorobiphenyl	0.01516	0	0.02	0	75.8	61 - 154	0.01451	4.4	20
Surr: Tetrachloro-m-xylene	0.01542	0	0.02	0	77.1	60 - 144	0.01476	4.39	20

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206672 (1)		Instrument: ECD_7		Method: CHLORINATED PEST/PCBS BY E608					
MBLK	Sample ID: MBLK-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:04					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810945		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	U	0.0200							
Aroclor 1221	U	0.0200							
Aroclor 1232	U	0.0200							
Aroclor 1242	U	0.0200							
Aroclor 1248	U	0.0200							
Aroclor 1254	U	0.0200							
Aroclor 1260	U	0.0200							
Total PCBs	U	0.0125							
Surr: Decachlorobiphenyl	0.0204	0	0.02	0	102	61 - 154			
Surr: Tetrachloro-m-xylene	0.01955	0	0.02	0	97.8	60 - 144			

LCS	Sample ID: LCS1-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:16					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810946		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4131	0.0200	0.5	0	82.6	54 - 138			
Aroclor 1260	0.4206	0.0200	0.5	0	84.1	57 - 136			
Surr: Decachlorobiphenyl	0.01836	0	0.02	0	91.8	61 - 154			
Surr: Tetrachloro-m-xylene	0.0184	0	0.02	0	92.0	60 - 144			

LCSD	Sample ID: LCSD1-206672	Units: UG/L		Analysis Date: 01-Feb-2024 17:29					
Client ID:	Run ID: ECD_7_457885		SeqNo: 7810947		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4673	0.0200	0.5	0	93.5	54 - 138	0.4131	12.3	20
Aroclor 1260	0.4681	0.0200	0.5	0	93.6	57 - 136	0.4206	10.7	20
Surr: Decachlorobiphenyl	0.01936	0	0.02	0	96.8	61 - 154	0.01836	5.31	20
Surr: Tetrachloro-m-xylene	0.02044	0	0.02	0	102	60 - 144	0.0184	10.5	20

The following samples were analyzed in this batch: HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-206751	Units: ug/L		Analysis Date: 06-Feb-2024 12:48					
Client ID:	Run ID: ICPMS07_458117		SeqNo: 7816127		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	1.089	10.0							J
Antimony	U	5.00							
Arsenic	U	2.00							
Barium	U	4.00							
Beryllium	U	5.00							
Boron	U	20.0							
Cadmium	U	2.00							
Chromium	U	4.00							
Cobalt	U	5.00							
Copper	U	2.00							
Iron	U	200							
Lead	U	2.00							
Magnesium	U	500							
Manganese	U	5.00							
Molybdenum	U	5.00							
Nickel	U	2.00							
Selenium	U	2.00							
Silver	U	2.00							
Thallium	U	2.00							
Tin	0.066	5.00							J
Titanium	U	5.00							
Zinc	U	4.00							

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-206751	Units: ug/L		Analysis Date: 05-Feb-2024 22:00					
Client ID:	Run ID: ICPMS07_457992		SeqNo: 7815474		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	33.12	10.0							
Antimony	U	5.00							
Arsenic	U	2.00							
Barium	0.085	4.00							J
Beryllium	U	5.00							
Boron	U	20.0							
Cadmium	U	2.00							
Chromium	U	4.00							
Cobalt	U	5.00							
Copper	U	2.00							
Iron	U	200							
Lead	U	2.00							
Magnesium	17.18	500							J
Manganese	0.653	5.00							J
Molybdenum	U	5.00							
Nickel	U	2.00							
Selenium	U	2.00							
Silver	U	2.00							
Thallium	U	2.00							
Tin	U	5.00							
Titanium	U	5.00							
Zinc	U	4.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
LCS		Sample ID: LCS-206751		Units: ug/L		Analysis Date: 05-Feb-2024 22:03			
Client ID:		Run ID: ICPMS07_457992		SeqNo: 7815475		PrepDate: 31-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	105.4	10.0	100	0	105	85 - 115			
Antimony	43.26	5.00	50	0	86.5	85 - 115			
Arsenic	48.82	2.00	50	0	97.6	85 - 115			
Barium	45.65	4.00	50	0	91.3	85 - 115			
Beryllium	46.95	5.00	50	0	93.9	85 - 115			
Boron	896	20.0	1000	0	89.6	85 - 115			
Cadmium	46.05	2.00	50	0	92.1	85 - 115			
Chromium	44.92	4.00	50	0	89.8	85 - 115			
Cobalt	47.51	5.00	50	0	95.0	85 - 115			
Copper	45.68	2.00	50	0	91.4	85 - 115			
Iron	4935	200	5000	0	98.7	85 - 115			
Lead	46.75	2.00	50	0	93.5	85 - 115			
Magnesium	4991	500	5000	0	99.8	85 - 115			
Manganese	47.03	5.00	50	0	94.1	85 - 115			
Molybdenum	44.74	5.00	50	0	89.5	85 - 115			
Nickel	49.15	2.00	50	0	98.3	85 - 115			
Selenium	48.39	2.00	50	0	96.8	85 - 115			
Silver	51.29	2.00	50	0	103	85 - 115			
Thallium	47.88	2.00	50	0	95.8	85 - 115			
Tin	99.94	5.00	100	0	99.9	85 - 115			
Titanium	147.2	5.00	150	0	98.1	85 - 115			
Zinc	49.11	4.00	50	0	98.2	85 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS		Sample ID: HS24011700-01MS		Units: ug/L		Analysis Date: 05-Feb-2024 22:35			
Client ID:		Run ID: ICPMS07_457992		SeqNo: 7815487		PrepDate: 31-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	7864	10.0	100	7294	570	70 - 130			SEO
Antimony	49.02	5.00	50	0.452	97.1	70 - 130			
Arsenic	57.78	2.00	50	1.146	113	70 - 130			
Barium	67.64	4.00	50	18.98	97.3	70 - 130			
Beryllium	49.55	5.00	50	0.054	99.0	70 - 130			
Boron	610.5	20.0	500	67.64	109	70 - 130			
Cadmium	48.97	2.00	50	0.467	97.0	70 - 130			
Chromium	55.71	4.00	50	5.339	101	70 - 130			
Cobalt	52.97	5.00	50	0.353	105	70 - 130			
Copper	54.61	2.00	50	3.825	102	70 - 130			
Iron	6002	200	5000	506.8	110	70 - 130			
Lead	49.71	2.00	50	0.384	98.7	70 - 130			
Magnesium	9503	500	5000	3801	114	70 - 130			
Manganese	89.64	5.00	50	34.52	110	70 - 130			
Molybdenum	54.72	5.00	50	5.873	97.7	70 - 130			
Nickel	65.82	2.00	50	11.02	110	70 - 130			
Selenium	53.1	2.00	50	0.6	105	70 - 130			
Silver	52.26	2.00	50	0.015	104	70 - 130			
Thallium	53	2.00	50	0.016	106	70 - 130			
Tin	114.3	5.00	100	0.26	114	70 - 130			
Titanium	176.6	5.00	150	1.28	117	70 - 130			
Zinc	80.08	4.00	50	23.21	114	70 - 130			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS		Sample ID: HS24011503-01MS		Units: ug/L		Analysis Date: 05-Feb-2024 22:07			
Client ID:		Run ID: ICPMS07_457992		SeqNo: 7815477		PrepDate: 31-Jan-2024		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	119.8	100	100	-2.935	123	70 - 130			
Antimony	45.9	50.0	50	0.33	91.1	70 - 130			J
Arsenic	55.65	20.0	50	1.319	109	70 - 130			
Barium	111.8	40.0	50	62.79	97.9	70 - 130			
Beryllium	55.44	50.0	50	0.116	111	70 - 130			
Boron	2638	200	500	2082	111	70 - 130			O
Cadmium	52.66	20.0	50	0.023	105	70 - 130			
Chromium	50.29	40.0	50	1.513	97.6	70 - 130			
Cobalt	50.04	50.0	50	0.305	99.5	70 - 130			
Copper	48.52	20.0	50	1.634	93.8	70 - 130			
Iron	5382	2000	5000	27.29	107	70 - 130			
Lead	48.65	20.0	50	0.153	97.0	70 - 130			
Magnesium	507600	5000	5000	514200	-132	70 - 130			SO
Manganese	83.76	50.0	50	34.39	98.8	70 - 130			
Molybdenum	55.67	50.0	50	5.217	101	70 - 130			
Nickel	52.5	20.0	50	1.192	103	70 - 130			
Selenium	55.54	20.0	50	1.774	108	70 - 130			
Silver	49.36	20.0	50	0.128	98.5	70 - 130			
Thallium	46.05	20.0	50	0.665	90.8	70 - 130			
Tin	96.83	50.0	100	1.111	95.7	70 - 130			
Titanium	155.1	50.0	150	0.404	103	70 - 130			
Zinc	65.64	40.0	50	13.9	103	70 - 130			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MSD	Sample ID: HS24011700-01MSD	Units: ug/L		Analysis Date: 05-Feb-2024 22:38					
Client ID:	Run ID: ICPMS07_457992		SeqNo: 7815488		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	7767	10.0	100	7294	473	70 - 130	7864	1.24	20 SEO
Antimony	48.72	5.00	50	0.452	96.5	70 - 130	49.02	0.616	20
Arsenic	57.63	2.00	50	1.146	113	70 - 130	57.78	0.263	20
Barium	66.27	4.00	50	18.98	94.6	70 - 130	67.64	2.03	20
Beryllium	47.54	5.00	50	0.054	95.0	70 - 130	49.55	4.13	20
Boron	602.1	20.0	500	67.64	107	70 - 130	610.5	1.39	20
Cadmium	47.63	2.00	50	0.467	94.3	70 - 130	48.97	2.77	20
Chromium	55.31	4.00	50	5.339	100.0	70 - 130	55.71	0.715	20
Cobalt	52.65	5.00	50	0.353	105	70 - 130	52.97	0.604	20
Copper	64.8	2.00	50	3.825	122	70 - 130	54.61	17.1	20
Iron	5962	200	5000	506.8	109	70 - 130	6002	0.671	20
Lead	48.86	2.00	50	0.384	97.0	70 - 130	49.71	1.73	20
Magnesium	9441	500	5000	3801	113	70 - 130	9503	0.658	20
Manganese	88.68	5.00	50	34.52	108	70 - 130	89.64	1.07	20
Molybdenum	53.72	5.00	50	5.873	95.7	70 - 130	54.72	1.84	20
Nickel	65.63	2.00	50	11.02	109	70 - 130	65.82	0.289	20
Selenium	52.26	2.00	50	0.6	103	70 - 130	53.1	1.59	20
Silver	51.71	2.00	50	0.015	103	70 - 130	52.26	1.05	20
Thallium	50.41	2.00	50	0.016	101	70 - 130	53	5.01	20
Zinc	85.81	4.00	50	23.21	125	70 - 130	80.08	6.91	20

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 206751 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
MSD		Sample ID: HS24011503-01MSD		Units: ug/L		Analysis Date: 06-Feb-2024 14:52				
Client ID:		Run ID: ICPMS07_458117		SeqNo: 7816387		PrepDate: 31-Jan-2024		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Aluminum	99.61	100	100	-2.935	103	70 - 130	119.8	0	20	J
Antimony	45.31	50.0	50	0.33	90.0	70 - 130	45.9	0	20	J
Arsenic	48.66	20.0	50	1.319	94.7	70 - 130	55.65	13.4	20	
Barium	104.7	40.0	50	62.79	83.9	70 - 130	111.8	6.48	20	
Beryllium	47.94	50.0	50	0.116	95.7	70 - 130	55.44	0	20	J
Boron	2222	200	500	2082	28.0	70 - 130	2638	17.1	20	SO
Cadmium	45.3	20.0	50	0.023	90.6	70 - 130	52.66	15	20	
Chromium	48.08	40.0	50	1.513	93.1	70 - 130	50.29	4.51	20	
Cobalt	46.46	50.0	50	0.305	92.3	70 - 130	50.04	0	20	J
Copper	44.77	20.0	50	1.634	86.3	70 - 130	48.52	8.03	20	
Iron	4775	2000	5000	27.29	95.0	70 - 130	5382	11.9	20	
Lead	44.44	20.0	50	0.153	88.6	70 - 130	48.65	9.03	20	
Magnesium	438000	5000	5000	514200	-1520	70 - 130	507600	14.7	20	SO
Manganese	72.92	50.0	50	34.39	77.1	70 - 130	83.76	13.8	20	
Molybdenum	51.37	50.0	50	5.217	92.3	70 - 130	55.67	8.03	20	
Nickel	44.75	20.0	50	1.192	87.1	70 - 130	52.5	15.9	20	
Selenium	47.79	20.0	50	1.774	92.0	70 - 130	55.54	15	20	
Silver	43.83	20.0	50	0.128	87.4	70 - 130	49.36	11.9	20	
Thallium	42.56	20.0	50	0.665	83.8	70 - 130	46.05	7.89	20	
Tin	90.15	50.0	100	1.111	89.0	70 - 130	96.83	7.15	20	
Titanium	140.4	50.0	150	0.404	93.3	70 - 130	155.1	9.97	20	
Zinc	61.51	40.0	50	13.9	95.2	70 - 130	65.64	6.5	20	

MSD		Sample ID: HS24011700-01MSD		Units: ug/L		Analysis Date: 06-Feb-2024 14:54				
Client ID:		Run ID: ICPMS07_458117		SeqNo: 7816388		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Tin	109.1	5.00	100	0.26	109	70 - 130	114.3	4.64	20	
Titanium	157.4	5.00	150	1.28	104	70 - 130	176.6	11.5	20	

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
MBLK	Sample ID: MBLK-206645	Units: ug/L		Analysis Date: 30-Jan-2024 12:46						
Client ID:	Run ID: SV-4_457604	SeqNo: 7806927		PrepDate: 30-Jan-2024		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4,5-Tetrachlorobenzene	U	5.00								
1,2,4-Trichlorobenzene	U	5.00								
1,2-Dichlorobenzene	U	5.00								
1,2-Diphenylhydrazine	U	5.00								
1,3-Dichlorobenzene	U	5.00								
1,4-Dichlorobenzene	U	5.00								
2,4,5-Trichlorophenol	U	5.00								
2,4,6-Trichlorophenol	U	5.00								
2,4-Dichlorophenol	U	5.00								
2,4-Dimethylphenol	U	5.00								
2,4-Dinitrophenol	U	5.00								
2,4-Dinitrotoluene	U	5.00								
2,6-Dichlorophenol	U	5.00								
2,6-Dinitrotoluene	U	5.00								
2-Chloronaphthalene	U	5.00								
2-Chlorophenol	U	5.00								
2-Methylphenol	U	5.00								
2-Nitrophenol	U	5.00								
3&4-Methylphenol	U	5.00								
3,3'-Dichlorobenzidine	U	5.00								
4,6-Dinitro-2-methylphenol	U	5.00								
4-Bromophenyl phenyl ether	U	5.00								
4-Chloro-3-methylphenol	U	5.00								
4-Chlorophenyl phenyl ether	U	5.00								
4-Nitrophenol	U	5.00								
Acenaphthene	U	5.00								
Acenaphthylene	U	5.00								
Anthracene	U	5.00								
Benz(a)anthracene	U	5.00								
Benzidine	U	5.00								
Benzo(a)pyrene	U	5.00								
Benzo(b)fluoranthene	U	5.00								
Benzo(g,h,i)perylene	U	5.00								
Benzo(k)fluoranthene	U	5.00								

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-206645	Units: ug/L		Analysis Date: 30-Jan-2024 12:46					
Client ID:	Run ID: SV-4_457604		SeqNo: 7806927		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	U	5.00							
Bis(2-chloroethyl)ether	U	5.00							
Bis(2-chloroisopropyl)ether	U	5.00							
Bis(2-ethylhexyl)phthalate	U	5.00							
Butyl benzyl phthalate	U	5.00							
Chrysene	U	5.00							
Dibenz(a,h)anthracene	U	5.00							
Diethyl phthalate	U	5.00							
Dimethyl phthalate	U	5.00							
Di-n-butyl phthalate	U	5.00							
Di-n-octyl phthalate	U	5.00							
Fluoranthene	U	5.00							
Fluorene	U	5.00							
Hexachlorobenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Hexachlorocyclopentadiene	U	5.00							
Hexachloroethane	U	5.00							
Indeno(1,2,3-cd)pyrene	U	5.00							
Isophorone	U	5.00							
Naphthalene	U	5.00							
Nitrobenzene	U	5.00							
N-Nitrosodiethylamine	U	5.00							
N-Nitrosodimethylamine	U	5.00							
N-Nitroso-di-n-butylamine	U	5.00							
N-Nitrosodi-n-propylamine	U	5.00							
N-Nitrosodiphenylamine	U	5.00							
Nonylphenol	U	5.00							
Pentachlorobenzene	U	5.00							
Pentachlorophenol	U	5.00							
Phenanthrene	U	5.00							
Phenol	U	5.00							
Pyrene	U	5.00							
Pyridine	U	5.00							
Cresols, Total	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-206645	Units: ug/L		Analysis Date: 30-Jan-2024 12:46					
Client ID:	Run ID: SV-4_457604		SeqNo: 7806927		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: 2,4,6-Tribromophenol	73.64	5.00	100	0	73.6	42 - 124			
Surr: 2-Fluorobiphenyl	74.44	5.00	100	0	74.4	48 - 120			
Surr: 2-Fluorophenol	54.4	5.00	100	0	54.4	20 - 120			
Surr: 4-Terphenyl-d14	71	5.00	100	0	71.0	51 - 135			
Surr: Nitrobenzene-d5	64.92	5.00	100	0	64.9	41 - 120			
Surr: Phenol-d6	57.41	5.00	100	0	57.4	20 - 120			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-206645		Units: ug/L		Analysis Date: 30-Jan-2024 19:51			
Client ID:		Run ID: SV-4_457604		SeqNo: 7806931		PrepDate: 30-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	70.48	5.00	100	0	70.5	49 - 120			
1,2,4-Trichlorobenzene	75.43	5.00	100	0	75.4	54 - 118			
1,2-Dichlorobenzene	67	5.00	100	0	67.0	49 - 115			
1,2-Diphenylhydrazine	72.87	5.00	100	0	72.9	57 - 134			
1,3-Dichlorobenzene	68.17	5.00	100	0	68.2	56 - 115			
1,4-Dichlorobenzene	66.22	5.00	100	0	66.2	56 - 115			
2,4,5-Trichlorophenol	75.98	5.00	100	0	76.0	52 - 115			
2,4,6-Trichlorophenol	84.44	5.00	100	0	84.4	56 - 115			
2,4-Dichlorophenol	74.64	5.00	100	0	74.6	53 - 115			
2,4-Dimethylphenol	70.62	5.00	100	0	70.6	53 - 115			
2,4-Dinitrophenol	83.33	5.00	100	0	83.3	47 - 115			
2,4-Dinitrotoluene	80.42	5.00	100	0	80.4	56 - 115			
2,6-Dichlorophenol	79.97	5.00	100	0	80.0	41 - 124			
2,6-Dinitrotoluene	79.12	5.00	100	0	79.1	57 - 115			
2-Chloronaphthalene	85.77	5.00	100	0	85.8	65 - 125			
2-Chlorophenol	66.42	5.00	100	0	66.4	54 - 115			
2-Methylphenol	64.92	5.00	100	0	64.9	53 - 115			
2-Nitrophenol	66.86	5.00	100	0	66.9	53 - 115			
3&4-Methylphenol	89.34	5.00	100	0	89.3	48 - 115			
3,3'-Dichlorobenzidine	78.47	5.00	100	0	78.5	25 - 115			
4,6-Dinitro-2-methylphenol	74.77	5.00	100	0	74.8	51 - 121			
4-Bromophenyl phenyl ether	82.15	5.00	100	0	82.2	49 - 115			
4-Chloro-3-methylphenol	74.34	5.00	100	0	74.3	51 - 115			
4-Chlorophenyl phenyl ether	73.99	5.00	100	0	74.0	56 - 115			
4-Nitrophenol	67.59	5.00	100	0	67.6	26 - 133			
Acenaphthene	74.17	5.00	100	0	74.2	57 - 115			
Acenaphthylene	71.55	5.00	100	0	71.6	57 - 118			
Anthracene	80.57	5.00	100	0	80.6	65 - 115			
Benz(a)anthracene	78.89	5.00	100	0	78.9	53 - 115			
Benzidine	13.88	5.00	100	0	13.9	10 - 115			
Benzo(a)pyrene	82.73	5.00	100	0	82.7	57 - 115			
Benzo(b)fluoranthene	88.69	5.00	100	0	88.7	54 - 117			
Benzo(g,h,i)perylene	84.15	5.00	100	0	84.1	56 - 115			
Benzo(k)fluoranthene	84.27	5.00	100	0	84.3	50 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCS		Sample ID: LCS-206645		Units: ug/L		Analysis Date: 30-Jan-2024 19:51				
Client ID:		Run ID: SV-4_457604		SeqNo: 7806931		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	82.27	5.00	100	0	82.3	54 - 115				
Bis(2-chloroethyl)ether	65.41	5.00	100	0	65.4	56 - 115				
Bis(2-chloroisopropyl)ether	62.93	5.00	100	0	62.9	48 - 115				
Bis(2-ethylhexyl)phthalate	82.19	5.00	100	0	82.2	50 - 115				
Butyl benzyl phthalate	82.67	5.00	100	0	82.7	51 - 115				
Chrysene	79.16	5.00	100	0	79.2	52 - 120				
Dibenz(a,h)anthracene	84.45	5.00	100	0	84.4	56 - 115				
Diethyl phthalate	79.62	5.00	100	0	79.6	57 - 115				
Dimethyl phthalate	78.52	5.00	100	0	78.5	56 - 115				
Di-n-butyl phthalate	85.74	5.00	100	0	85.7	54 - 115				
Di-n-octyl phthalate	87.14	5.00	100	0	87.1	49 - 115				
Fluoranthene	84.83	5.00	100	0	84.8	58 - 115				
Fluorene	72.57	5.00	100	0	72.6	56 - 115				
Hexachlorobenzene	87.41	5.00	100	0	87.4	54 - 115				
Hexachlorobutadiene	82.28	5.00	100	0	82.3	51 - 115				
Hexachlorocyclopentadiene	72.6	5.00	100	0	72.6	48 - 115				
Hexachloroethane	68.97	5.00	100	0	69.0	54 - 115				
Indeno(1,2,3-cd)pyrene	84.03	5.00	100	0	84.0	51 - 115				
Isophorone	66.01	5.00	100	0	66.0	55 - 115				
Naphthalene	69.45	5.00	100	0	69.5	55 - 115				
Nitrobenzene	65.92	5.00	100	0	65.9	40 - 124				
N-Nitrosodiethylamine	30.29	5.00	50	0	60.6	40 - 130				
N-Nitrosodimethylamine	55.32	5.00	100	0	55.3	42 - 115				
N-Nitroso-di-n-butylamine	31.83	5.00	50	0	63.7	40 - 130				
N-Nitrosodi-n-propylamine	64	5.00	100	0	64.0	55 - 119				
N-Nitrosodiphenylamine	81.53	5.00	100	0	81.5	52 - 115				
Pentachlorobenzene	75.48	5.00	100	0	75.5	50 - 117				
Pentachlorophenol	84.3	5.00	100	0	84.3	45 - 125				
Phenanthrene	78.25	5.00	100	0	78.2	57 - 115				
Phenol	62.04	5.00	100	0	62.0	38 - 115				
Pyrene	77.67	5.00	100	0	77.7	54 - 119				
Pyridine	43.03	5.00	100	0	43.0	34 - 115				
Cresols, Total	154.3	5.00	200	0	77.1	48 - 115				
Surr: 2,4,6-Tribromophenol	72.08	5.00	100	0	72.1	42 - 124				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCS	Sample ID: LCS-206645	Units: ug/L		Analysis Date: 30-Jan-2024 19:51						
Client ID:	Run ID: SV-4_457604		SeqNo: 7806931		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorobiphenyl	67.21	5.00	100	0	67.2	48 - 120				
Surr: 2-Fluorophenol	54.69	5.00	100	0	54.7	20 - 120				
Surr: 4-Terphenyl-d14	67.66	5.00	100	0	67.7	51 - 135				
Surr: Nitrobenzene-d5	57.44	5.00	100	0	57.4	41 - 120				
Surr: Phenol-d6	56	5.00	100	0	56.0	20 - 120				

LCS	Sample ID: LCS1-206645	Units: ug/L		Analysis Date: 30-Jan-2024 14:10						
Client ID:	Run ID: SV-4_457604		SeqNo: 7806929		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	35.42	5.00	50	0	70.8	40 - 140				
Surr: 2,4,6-Tribromophenol	86.78	5.00	100	0	86.8	42 - 124				
Surr: 2-Fluorobiphenyl	84.54	5.00	100	0	84.5	48 - 120				
Surr: 2-Fluorophenol	83.11	5.00	100	0	83.1	20 - 120				
Surr: 4-Terphenyl-d14	82.28	5.00	100	0	82.3	51 - 135				
Surr: Nitrobenzene-d5	77.49	5.00	100	0	77.5	41 - 120				
Surr: Phenol-d6	87.37	5.00	100	0	87.4	20 - 120				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206645		Units: ug/L		Analysis Date: 30-Jan-2024 13:28				
Client ID:		Run ID: SV-4_457604		SeqNo: 7806928		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4,5-Tetrachlorobenzene	73.61	5.00	100	0	73.6	49 - 120	70.48	4.34	20	
1,2,4-Trichlorobenzene	75.97	5.00	100	0	76.0	54 - 118	75.43	0.71	20	
1,2-Dichlorobenzene	67.07	5.00	100	0	67.1	49 - 115	67	0.0935	20	
1,2-Diphenylhydrazine	80.4	5.00	100	0	80.4	57 - 134	72.87	9.83	20	
1,3-Dichlorobenzene	68.23	5.00	100	0	68.2	56 - 115	68.17	0.0816	20	
1,4-Dichlorobenzene	65.54	5.00	100	0	65.5	56 - 115	66.22	1.03	20	
2,4,5-Trichlorophenol	80.12	5.00	100	0	80.1	52 - 115	75.98	5.31	20	
2,4,6-Trichlorophenol	84.31	5.00	100	0	84.3	56 - 115	84.44	0.145	20	
2,4-Dichlorophenol	71.93	5.00	100	0	71.9	53 - 115	74.64	3.7	20	
2,4-Dimethylphenol	71.76	5.00	100	0	71.8	53 - 115	70.62	1.61	20	
2,4-Dinitrophenol	80.66	5.00	100	0	80.7	47 - 115	83.33	3.26	20	
2,4-Dinitrotoluene	76.64	5.00	100	0	76.6	56 - 115	80.42	4.82	20	
2,6-Dichlorophenol	76.08	5.00	100	0	76.1	41 - 124	79.97	4.99	20	
2,6-Dinitrotoluene	78.03	5.00	100	0	78.0	57 - 115	79.12	1.38	20	
2-Chloronaphthalene	89.32	5.00	100	0	89.3	65 - 125	85.77	4.06	20	
2-Chlorophenol	66.7	5.00	100	0	66.7	54 - 115	66.42	0.42	20	
2-Methylphenol	64.43	5.00	100	0	64.4	53 - 115	64.92	0.759	20	
2-Nitrophenol	68.45	5.00	100	0	68.5	53 - 115	66.86	2.36	20	
3&4-Methylphenol	87.22	5.00	100	0	87.2	48 - 115	89.34	2.4	20	
3,3'-Dichlorobenzidine	84.27	5.00	100	0	84.3	25 - 115	78.47	7.13	20	
4,6-Dinitro-2-methylphenol	80.35	5.00	100	0	80.3	51 - 121	74.77	7.19	20	
4-Bromophenyl phenyl ether	85.29	5.00	100	0	85.3	49 - 115	82.15	3.74	20	
4-Chloro-3-methylphenol	70.41	5.00	100	0	70.4	51 - 115	74.34	5.43	20	
4-Chlorophenyl phenyl ether	73.95	5.00	100	0	74.0	56 - 115	73.99	0.053	20	
4-Nitrophenol	60.77	5.00	100	0	60.8	26 - 133	67.59	10.6	20	
Acenaphthene	72.98	5.00	100	0	73.0	57 - 115	74.17	1.61	20	
Acenaphthylene	71.88	5.00	100	0	71.9	57 - 118	71.55	0.452	20	
Anthracene	81.33	5.00	100	0	81.3	65 - 115	80.57	0.931	20	
Benz(a)anthracene	83.26	5.00	100	0	83.3	53 - 115	78.89	5.39	20	
Benzidine	13.51	5.00	100	0	13.5	10 - 115	13.88	2.7	20	
Benzo(a)pyrene	83.09	5.00	100	0	83.1	57 - 115	82.73	0.431	20	
Benzo(b)fluoranthene	90.43	5.00	100	0	90.4	54 - 117	88.69	1.94	20	
Benzo(g,h,i)perylene	88.68	5.00	100	0	88.7	56 - 115	84.15	5.25	20	
Benzo(k)fluoranthene	64.12	5.00	100	0	64.1	50 - 115	84.27	27.2	20	R

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206645		Units: ug/L		Analysis Date: 30-Jan-2024 13:28				
Client ID:		Run ID: SV-4_457604		SeqNo: 7806928		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	84.71	5.00	100	0	84.7	54 - 115	82.27	2.92	20	
Bis(2-chloroethyl)ether	73.37	5.00	100	0	73.4	56 - 115	65.41	11.5	20	
Bis(2-chloroisopropyl)ether	67.87	5.00	100	0	67.9	48 - 115	62.93	7.55	20	
Bis(2-ethylhexyl)phthalate	84.39	5.00	100	0	84.4	50 - 115	82.19	2.65	20	
Butyl benzyl phthalate	84.81	5.00	100	0	84.8	51 - 115	82.67	2.56	20	
Chrysene	77.41	5.00	100	0	77.4	52 - 120	79.16	2.24	20	
Dibenz(a,h)anthracene	87.9	5.00	100	0	87.9	56 - 115	84.45	4.01	20	
Diethyl phthalate	79.19	5.00	100	0	79.2	57 - 115	79.62	0.537	20	
Dimethyl phthalate	78.59	5.00	100	0	78.6	56 - 115	78.52	0.0793	20	
Di-n-butyl phthalate	88.71	5.00	100	0	88.7	54 - 115	85.74	3.41	20	
Di-n-octyl phthalate	88.07	5.00	100	0	88.1	49 - 115	87.14	1.06	20	
Fluoranthene	85.09	5.00	100	0	85.1	58 - 115	84.83	0.308	20	
Fluorene	69.5	5.00	100	0	69.5	56 - 115	72.57	4.32	20	
Hexachlorobenzene	87.86	5.00	100	0	87.9	54 - 115	87.41	0.515	20	
Hexachlorobutadiene	82.16	5.00	100	0	82.2	51 - 115	82.28	0.145	20	
Hexachlorocyclopentadiene	81.15	5.00	100	0	81.1	48 - 115	72.6	11.1	20	
Hexachloroethane	70.21	5.00	100	0	70.2	54 - 115	68.97	1.79	20	
Indeno(1,2,3-cd)pyrene	86.8	5.00	100	0	86.8	51 - 115	84.03	3.24	20	
Isophorone	67.68	5.00	100	0	67.7	55 - 115	66.01	2.49	20	
Naphthalene	70.57	5.00	100	0	70.6	55 - 115	69.45	1.59	20	
Nitrobenzene	67.01	5.00	100	0	67.0	40 - 124	65.92	1.64	20	
N-Nitrosodiethylamine	30.35	5.00	50	0	60.7	40 - 130	30.29	0.196	20	
N-Nitrosodimethylamine	58.97	5.00	100	0	59.0	42 - 115	55.32	6.4	20	
N-Nitroso-di-n-butylamine	31.91	5.00	50	0	63.8	40 - 130	31.83	0.27	20	
N-Nitrosodi-n-propylamine	64.26	5.00	100	0	64.3	55 - 119	64	0.412	20	
N-Nitrosodiphenylamine	83.5	5.00	100	0	83.5	52 - 115	81.53	2.39	20	
Pentachlorobenzene	75.61	5.00	100	0	75.6	50 - 117	75.48	0.163	20	
Pentachlorophenol	84.37	5.00	100	0	84.4	45 - 125	84.3	0.0823	20	
Phenanthrene	78.68	5.00	100	0	78.7	57 - 115	78.25	0.549	20	
Phenol	66.45	5.00	100	0	66.4	38 - 115	62.04	6.86	20	
Pyrene	75.59	5.00	100	0	75.6	54 - 119	77.67	2.7	20	
Pyridine	46.89	5.00	100	0	46.9	34 - 115	43.03	8.59	20	
Cresols, Total	151.6	5.00	200	0	75.8	48 - 115	154.3	1.71	20	
Surr: 2,4,6-Tribromophenol	68.38	5.00	100	0	68.4	42 - 124	72.08	5.27	20	

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206645 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-206645		Units: ug/L		Analysis Date: 30-Jan-2024 13:28				
Client ID:		Run ID: SV-4_457604		SeqNo: 7806928		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorobiphenyl	69.92	5.00	100	0	69.9	48 - 120	67.21	3.95	20	
Surr: 2-Fluorophenol	55.45	5.00	100	0	55.5	20 - 120	54.69	1.38	20	
Surr: 4-Terphenyl-d14	66.23	5.00	100	0	66.2	51 - 135	67.66	2.14	20	
Surr: Nitrobenzene-d5	60.99	5.00	100	0	61.0	41 - 120	57.44	5.99	20	
Surr: Phenol-d6	57.14	5.00	100	0	57.1	20 - 120	56	2.03	20	

LCSD		Sample ID: LCSD1-206645		Units: ug/L		Analysis Date: 30-Jan-2024 23:22				
Client ID:		Run ID: SV-4_457604		SeqNo: 7806936		PrepDate: 30-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	31.04	5.00	50	0	62.1	40 - 140	35.42	13.2	20	
Surr: 2,4,6-Tribromophenol	101.3	5.00	100	0	101	42 - 124	86.78	15.5	20	
Surr: 2-Fluorobiphenyl	81.04	5.00	100	0	81.0	48 - 120	84.54	4.23	20	
Surr: 2-Fluorophenol	81.4	5.00	100	0	81.4	20 - 120	83.11	2.07	20	
Surr: 4-Terphenyl-d14	86.48	5.00	100	0	86.5	51 - 135	82.28	4.98	20	
Surr: Nitrobenzene-d5	70.94	5.00	100	0	70.9	41 - 120	77.49	8.82	20	
Surr: Phenol-d6	91.59	5.00	100	0	91.6	20 - 120	87.37	4.72	20	

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240130	Units: ug/L		Analysis Date: 30-Jan-2024 10:47					
Client ID:	Run ID: VOA11_457633		SeqNo: 7805388		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	U	5.00							
1,1,2,2-Tetrachloroethane	U	5.00							
1,1,2-Trichloroethane	U	5.00							
1,1-Dichloroethane	U	5.00							
1,1-Dichloroethene	U	5.00							
1,2-Dibromoethane	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Dichloroethane	U	5.00							
1,2-Dichloropropane	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2-Butanone	U	10.0							
2-Chloroethyl vinyl ether	U	10.0							
Acetonitrile	U	50.0							
Acrolein	U	20.0							
Acrylonitrile	U	10.0							
Benzene	U	5.00							
Bromodichloromethane	U	5.00							
Bromoform	U	5.00							
Bromomethane	U	5.00							
Carbon disulfide	U	10.0							
Carbon tetrachloride	U	5.00							
Chlorobenzene	U	5.00							
Chloroethane	U	5.00							
Chloroform	U	5.00							
Chloromethane	U	5.00							
cis-1,3-Dichloropropene	U	5.00							
Dibromochloromethane	U	5.00							
Dibromomethane	U	5.00							
Ethylbenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Methylene chloride	U	10.0							
Styrene	U	5.00							
Tetrachloroethene	U	5.00							

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240130	Units: ug/L		Analysis Date: 30-Jan-2024 10:47					
Client ID:	Run ID: VOA11_457633		SeqNo: 7805388		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	U	5.00							
trans-1,2-Dichloroethene	U	5.00							
trans-1,3-Dichloropropene	U	5.00							
Trichloroethene	U	5.00							
Vinyl chloride	U	2.00							
Xylenes, Total	U	5.00							
Total Trihalomethanes (TTHMs)	U	5.00							
Surr: 1,2-Dichloroethane-d4	53.49	5.00	50	0	107	70 - 126			
Surr: 4-Bromofluorobenzene	48.48	5.00	50	0	97.0	82 - 124			
Surr: Dibromofluoromethane	50.92	5.00	50	0	102	77 - 123			
Surr: Toluene-d8	49.33	5.00	50	0	98.7	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
LCS		Sample ID: VLCSW-240130		Units: ug/L		Analysis Date: 30-Jan-2024 09:44			
Client ID:		Run ID: VOA11_457633		SeqNo: 7805387		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	17.59	5.00	20	0	88.0	70 - 130			
1,1,2,2-Tetrachloroethane	17.78	5.00	20	0	88.9	70 - 120			
1,1,2-Trichloroethane	17.86	5.00	20	0	89.3	77 - 113			
1,1-Dichloroethane	17.17	5.00	20	0	85.9	71 - 122			
1,1-Dichloroethene	18.18	5.00	20	0	90.9	70 - 130			
1,2-Dibromoethane	18.41	5.00	20	0	92.0	76 - 123			
1,2-Dichlorobenzene	18.92	5.00	20	0	94.6	77 - 113			
1,2-Dichloroethane	16.79	5.00	20	0	83.9	70 - 124			
1,2-Dichloropropane	19.02	5.00	20	0	95.1	72 - 119			
1,3-Dichlorobenzene	18.92	5.00	20	0	94.6	78 - 118			
1,4-Dichlorobenzene	17.79	5.00	20	0	88.9	79 - 113			
2-Butanone	35.42	10.0	40	0	88.5	70 - 130			
2-Chloroethyl vinyl ether	35.78	10.0	40	0	89.5	60 - 135			
Acetonitrile	178.7	50.0	200	0	89.3	70 - 130			
Acrolein	29.72	20.0	40	0	74.3	70 - 130			
Acrylonitrile	34.58	10.0	40	0	86.5	70 - 130			
Benzene	18.2	5.00	20	0	91.0	74 - 120			
Bromodichloromethane	17.9	5.00	20	0	89.5	74 - 122			
Bromoform	16.49	5.00	20	0	82.4	73 - 128			
Bromomethane	20.03	5.00	20	0	100	70 - 130			
Carbon disulfide	32.82	10.0	40	0	82.0	70 - 130			
Carbon tetrachloride	17.4	5.00	20	0	87.0	71 - 125			
Chlorobenzene	18.09	5.00	20	0	90.4	76 - 113			
Chloroethane	17.7	5.00	20	0	88.5	70 - 130			
Chloroform	17.75	5.00	20	0	88.7	71 - 121			
Chloromethane	17.44	5.00	20	0	87.2	70 - 129			
cis-1,3-Dichloropropene	17.5	5.00	20	0	87.5	73 - 127			
Dibromochloromethane	18.28	5.00	20	0	91.4	77 - 122			
Dibromomethane	17.7	5.00	20	0	88.5	78 - 121			
Ethylbenzene	19.23	5.00	20	0	96.2	77 - 117			
Hexachlorobutadiene	18.01	5.00	20	0	90.1	70 - 130			
Methylene chloride	17.62	10.0	20	0	88.1	70 - 127			
Styrene	17.77	5.00	20	0	88.9	72 - 126			
Tetrachloroethene	18.07	5.00	20	0	90.4	76 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
LCS		Sample ID: VLCSW-240130		Units: ug/L		Analysis Date: 30-Jan-2024 09:44			
Client ID:		Run ID: VOA11_457633		SeqNo: 7805387		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	18.04	5.00	20	0	90.2	77 - 118			
trans-1,2-Dichloroethene	18.41	5.00	20	0	92.0	72 - 127			
trans-1,3-Dichloropropene	16.76	5.00	20	0	83.8	77 - 119			
Trichloroethene	18.04	5.00	20	0	90.2	79 - 120			
Vinyl chloride	21.91	2.00	20	0	110	70 - 130			
Xylenes, Total	54.62	5.00	60	0	91.0	75 - 122			
Total Trihalomethanes (TTHMs)	70.42	5.00	80	0	88.0	65 - 135			
Surr: 1,2-Dichloroethane-d4	48.12	5.00	50	0	96.2	70 - 130			
Surr: 4-Bromofluorobenzene	50.38	5.00	50	0	101	83 - 122			
Surr: Dibromofluoromethane	48.95	5.00	50	0	97.9	73 - 126			
Surr: Toluene-d8	49.46	5.00	50	0	98.9	81 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
MS		Sample ID: HS24011610-04MS		Units: ug/L		Analysis Date: 30-Jan-2024 12:11			
Client ID:		Run ID: VOA11_457633		SeqNo: 7805389		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	16.39	5.00	20	0	81.9	70 - 130			
1,1,2,2-Tetrachloroethane	15.15	5.00	20	0	75.7	70 - 123			
1,1,2-Trichloroethane	15.88	5.00	20	0	79.4	70 - 117			
1,1-Dichloroethane	16.35	5.00	20	0	81.8	70 - 127			
1,1-Dichloroethene	16.12	5.00	20	0	80.6	70 - 130			
1,2-Dibromoethane	15.7	5.00	20	0	78.5	70 - 124			
1,2-Dichlorobenzene	15.13	5.00	20	0	75.6	70 - 115			
1,2-Dichloroethane	15.37	5.00	20	0	76.8	70 - 127			
1,2-Dichloropropane	15.65	5.00	20	0	78.3	70 - 122			
1,3-Dichlorobenzene	15.39	5.00	20	0	77.0	70 - 119			
1,4-Dichlorobenzene	14.92	5.00	20	0	74.6	70 - 114			
2-Butanone	29.71	10.0	40	0	74.3	70 - 130			
2-Chloroethyl vinyl ether	U	10.0	40	0	0	65 - 135			S
Acetonitrile	162.2	50.0	200	0	81.1	70 - 130			
Acrolein	33.3	20.0	40	0	83.3	70 - 130			
Acrylonitrile	28.42	10.0	40	0	71.1	70 - 130			
Benzene	16.13	5.00	20	0	80.7	70 - 127			
Bromodichloromethane	15.24	5.00	20	0	76.2	70 - 124			
Bromoform	13.33	5.00	20	0	66.7	70 - 129			S
Bromomethane	15.87	5.00	20	0	79.4	70 - 130			
Carbon disulfide	28.4	10.0	40	0	71.0	70 - 130			
Carbon tetrachloride	16.62	5.00	20	0	83.1	70 - 130			
Chlorobenzene	15.65	5.00	20	0	78.2	70 - 114			
Chloroethane	14.33	5.00	20	0	71.7	70 - 130			
Chloroform	16.13	5.00	20	0	80.7	70 - 125			
Chloromethane	15.48	5.00	20	0	77.4	70 - 130			
cis-1,3-Dichloropropene	14.25	5.00	20	0	71.2	70 - 125			
Dibromochloromethane	14.83	5.00	20	0	74.1	70 - 124			
Dibromomethane	16.13	5.00	20	0	80.6	70 - 124			
Ethylbenzene	16.53	5.00	20	0	82.7	70 - 124			
Hexachlorobutadiene	13.67	5.00	20	0	68.4	70 - 130			S
Methylene chloride	15.78	10.0	20	0	78.9	70 - 128			
Styrene	1.026	5.00	20	0	5.13	70 - 130			JS
Tetrachloroethene	15.41	5.00	20	0	77.1	70 - 130			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
MS		Sample ID: HS24011610-04MS		Units: ug/L		Analysis Date: 30-Jan-2024 12:11			
Client ID:		Run ID: VOA11_457633		SeqNo: 7805389		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	15.98	5.00	20	0	79.9	70 - 123			
trans-1,2-Dichloroethene	16.34	5.00	20	0	81.7	70 - 130			
trans-1,3-Dichloropropene	14.27	5.00	20	0	71.4	70 - 121			
Trichloroethene	15.91	5.00	20	0	79.5	70 - 129			
Vinyl chloride	17.08	2.00	20	0	85.4	70 - 130			
Xylenes, Total	44.97	5.00	60	0	75.0	70 - 130			
Total Trihalomethanes (TTHMs)	59.53	5.00	80	0	74.4	65 - 135			
Surr: 1,2-Dichloroethane-d4	51.68	5.00	50	0	103	70 - 126			
Surr: 4-Bromofluorobenzene	51.45	5.00	50	0	103	82 - 124			
Surr: Dibromofluoromethane	51.16	5.00	50	0	102	77 - 123			
Surr: Toluene-d8	49.53	5.00	50	0	99.1	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES						
MSD		Sample ID: HS24011610-04MSD		Units: ug/L		Analysis Date: 30-Jan-2024 14:17				
Client ID:		Run ID: VOA11_457633		SeqNo: 7805393		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	18.55	5.00	20	0	92.8	70 - 130	16.39	12.4	20	
1,1,2,2-Tetrachloroethane	16.59	5.00	20	0	83.0	70 - 123	15.15	9.1	20	
1,1,2-Trichloroethane	17.59	5.00	20	0	88.0	70 - 117	15.88	10.2	20	
1,1-Dichloroethane	17.56	5.00	20	0	87.8	70 - 127	16.35	7.1	20	
1,1-Dichloroethene	17.1	5.00	20	0	85.5	70 - 130	16.12	5.92	20	
1,2-Dibromoethane	17.15	5.00	20	0	85.8	70 - 124	15.7	8.88	20	
1,2-Dichlorobenzene	16.96	5.00	20	0	84.8	70 - 115	15.13	11.5	20	
1,2-Dichloroethane	17.37	5.00	20	0	86.9	70 - 127	15.37	12.2	20	
1,2-Dichloropropane	18.82	5.00	20	0	94.1	70 - 122	15.65	18.4	20	
1,3-Dichlorobenzene	17.08	5.00	20	0	85.4	70 - 119	15.39	10.4	20	
1,4-Dichlorobenzene	16.21	5.00	20	0	81.1	70 - 114	14.92	8.3	20	
2-Butanone	31.86	10.0	40	0	79.6	70 - 130	29.71	6.98	20	
2-Chloroethyl vinyl ether	U	10.0	40	0	0	65 - 135	0	0	20	S
Acetonitrile	177.8	50.0	200	0	88.9	70 - 130	162.2	9.15	20	
Acrolein	45.25	20.0	40	0	113	70 - 130	33.3	30.4	20	R
Acrylonitrile	34.59	10.0	40	0	86.5	70 - 130	28.42	19.6	20	
Benzene	18.41	5.00	20	0	92.1	70 - 127	16.13	13.2	20	
Bromodichloromethane	17.89	5.00	20	0	89.5	70 - 124	15.24	16	20	
Bromoform	14.81	5.00	20	0	74.0	70 - 129	13.33	10.5	20	
Bromomethane	18.33	5.00	20	0	91.6	70 - 130	15.87	14.4	20	
Carbon disulfide	32.55	10.0	40	0	81.4	70 - 130	28.4	13.6	20	
Carbon tetrachloride	18.23	5.00	20	0	91.1	70 - 130	16.62	9.25	20	
Chlorobenzene	17.01	5.00	20	0	85.0	70 - 114	15.65	8.32	20	
Chloroethane	16.87	5.00	20	0	84.4	70 - 130	14.33	16.3	20	
Chloroform	17.96	5.00	20	0	89.8	70 - 125	16.13	10.8	20	
Chloromethane	18.45	5.00	20	0	92.3	70 - 130	15.48	17.5	20	
cis-1,3-Dichloropropene	16.19	5.00	20	0	81.0	70 - 125	14.25	12.8	20	
Dibromochloromethane	16.78	5.00	20	0	83.9	70 - 124	14.83	12.3	20	
Dibromomethane	17.61	5.00	20	0	88.0	70 - 124	16.13	8.77	20	
Ethylbenzene	17.66	5.00	20	0	88.3	70 - 124	16.53	6.64	20	
Hexachlorobutadiene	16.33	5.00	20	0	81.7	70 - 130	13.67	17.7	20	
Methylene chloride	17.97	10.0	20	0	89.9	70 - 128	15.78	13	20	
Styrene	3.429	5.00	20	0	17.1	70 - 130	1.026	0	20	JS
Tetrachloroethene	17.03	5.00	20	0	85.1	70 - 130	15.41	9.96	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R457633 (0)		Instrument: VOA11		Method: VOLATILES					
MSD	Sample ID: HS24011610-04MSD		Units: ug/L		Analysis Date: 30-Jan-2024 14:17				
Client ID:	Run ID: VOA11_457633		SeqNo: 7805393		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	17.5	5.00	20	0	87.5	70 - 123	15.98	9.08	20
trans-1,2-Dichloroethene	17.64	5.00	20	0	88.2	70 - 130	16.34	7.65	20
trans-1,3-Dichloropropene	15.95	5.00	20	0	79.7	70 - 121	14.27	11.1	20
Trichloroethene	17.6	5.00	20	0	88.0	70 - 129	15.91	10.1	20
Vinyl chloride	21.05	2.00	20	0	105	70 - 130	17.08	20.8	20 R
Xylenes, Total	51.09	5.00	60	0	85.2	70 - 130	44.97	12.7	20
Total Trihalomethanes (TTHMs)	67.44	5.00	80	0	84.3	65 - 135	59.53	12.5	30
Surr: 1,2-Dichloroethane-d4	51.34	5.00	50	0	103	70 - 126	51.68	0.652	20
Surr: 4-Bromofluorobenzene	49.62	5.00	50	0	99.2	82 - 124	51.45	3.62	20
Surr: Dibromofluoromethane	51.09	5.00	50	0	102	77 - 123	51.16	0.14	20
Surr: Toluene-d8	49.43	5.00	50	0	98.9	82 - 127	49.53	0.215	20
The following samples were analyzed in this batch: HS24011577-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457755 (0)		Instrument: VOA9		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240131	Units: ug/L		Analysis Date: 31-Jan-2024 16:34					
Client ID:	Run ID: VOA9_457755	SeqNo: 7807817		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	U	5.00							
Surr: 1,2-Dichloroethane-d4	38.81	5.00	50	0	77.6	70 - 126			
Surr: 4-Bromofluorobenzene	49.51	5.00	50	0	99.0	82 - 124			
Surr: Dibromofluoromethane	39.92	5.00	50	0	79.8	77 - 123			
Surr: Toluene-d8	49.12	5.00	50	0	98.2	82 - 127			
LCS	Sample ID: VLCSW-240131	Units: ug/L		Analysis Date: 31-Jan-2024 15:27					
Client ID:	Run ID: VOA9_457755	SeqNo: 7807815		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	15.29	5.00	20	0	76.5	70 - 130			
Surr: 1,2-Dichloroethane-d4	49.51	5.00	50	0	99.0	70 - 130			
Surr: 4-Bromofluorobenzene	48.55	5.00	50	0	97.1	83 - 122			
Surr: Dibromofluoromethane	49.69	5.00	50	0	99.4	73 - 126			
Surr: Toluene-d8	48.59	5.00	50	0	97.2	81 - 119			
LCSD	Sample ID: VLCSDW-240131	Units: ug/L		Analysis Date: 31-Jan-2024 15:49					
Client ID:	Run ID: VOA9_457755	SeqNo: 7807816		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	16.07	5.00	20	0	80.3	70 - 130	15.29	4.93	20
Surr: 1,2-Dichloroethane-d4	47.94	5.00	50	0	95.9	70 - 130	49.51	3.22	20
Surr: 4-Bromofluorobenzene	49.82	5.00	50	0	99.6	83 - 122	48.55	2.59	20
Surr: Dibromofluoromethane	48.56	5.00	50	0	97.1	73 - 126	49.69	2.29	20
Surr: Toluene-d8	49.35	5.00	50	0	98.7	81 - 119	48.59	1.56	20
The following samples were analyzed in this batch: HS24011577-01									

Client:ChampionX LLC

Project:2024 Permit Renewal-WK2

WorkOrder:HS24011577

QC BATCH REPORT

Batch ID: 206637 (0)		Instrument: Skalar 02		Method: BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011					
MBLK	Sample ID: MBLK-206637	Units: mg/L		Analysis Date: 03-Feb-2024 12:43					
Client ID:	Run ID: Skalar 02_457945		SeqNo: 7812445		PrepDate: 29-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206637	Units: mg/L		Analysis Date: 03-Feb-2024 12:43					
Client ID:	Run ID: Skalar 02_457945		SeqNo: 7812444		PrepDate: 29-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	176.9	2.00	198	0	89.3	85 - 115			

DUP	Sample ID: HS24011583-02DUP	Units: mg/L		Analysis Date: 03-Feb-2024 12:43					
Client ID:	Run ID: Skalar 02_457945		SeqNo: 7812443		PrepDate: 29-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00					-0.37	0	20

The following samples were analyzed in this batch: HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 206638 (0)		Instrument: Skalar 02		Method: CBOD BY SM5210B-2011					
MBLK	Sample ID: MBLK-206638	Units: mg/L		Analysis Date: 03-Feb-2024 12:45					
Client ID:		Run ID: Skalar 02_457946		SeqNo: 7812450		PrepDate: 29-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206638	Units: mg/L		Analysis Date: 03-Feb-2024 12:45					
Client ID:		Run ID: Skalar 02_457946		SeqNo: 7812449		PrepDate: 29-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	168.9	2.00	198	0	85.3	85 - 115			

DUP	Sample ID: HS24011577-01DUP	Units: mg/L		Analysis Date: 03-Feb-2024 12:45					
Client ID: OF001 WK 2		Run ID: Skalar 02_457946		SeqNo: 7812448		PrepDate: 29-Jan-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00					0.72	0	20

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: 206735 (0)		Instrument: UV-2450		Method: SURFACTANTS (MBAS) BY SM5540C						
MBLK	Sample ID: MBLK-206735	Units: mg/L 340 MW LAS		Analysis Date: 30-Jan-2024 16:29						
Client ID:	Run ID: UV-2450_457639		SeqNo: 7805450		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	U	0.0500								
LCS	Sample ID: LCS-206735	Units: mg/L 340 MW LAS		Analysis Date: 30-Jan-2024 16:29						
Client ID:	Run ID: UV-2450_457639		SeqNo: 7805448		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.472	0.0500	0.5	0	94.4	85 - 115				
LCSD	Sample ID: LCSD-206735	Units: mg/L 340 MW LAS		Analysis Date: 30-Jan-2024 16:29						
Client ID:	Run ID: UV-2450_457639		SeqNo: 7805449		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.465	0.0500	0.5	0	93.0	85 - 115	0.472	1.49	20	
MS	Sample ID: HS24011577-01MS	Units: mg/L 340 MW LAS		Analysis Date: 30-Jan-2024 16:29						
Client ID: OF001 WK 2	Run ID: UV-2450_457639		SeqNo: 7805447		PrepDate: 30-Jan-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.48	0.0500	0.5	0.061	83.8	80 - 120				
The following samples were analyzed in this batch: HS24011577-01										

Client:ChampionX LLC

Project:2024 Permit Renewal-WK2

WorkOrder:HS24011577

QC BATCH REPORT

Batch ID: 206762 (0)		Instrument: UV-2450		Method: CYANIDE BY SM 4500CN E&G-2011					
MBLK	Sample ID: MBLK-206762	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808872		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	U	0.00500							

LCS	Sample ID: LCS-206762	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808871		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.206	0.00500	0.2	0	103	80 - 120			

MS	Sample ID: HS24011692-05MS	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808869		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.213	0.00500	0.2	0.001	106	80 - 120			

MSD	Sample ID: HS24011692-05MSD	Units: mg/L		Analysis Date: 01-Feb-2024 12:12					
Client ID:	Run ID: UV-2450_457793		SeqNo: 7808870		PrepDate: 31-Jan-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.213	0.00500	0.2	0.001	106	80 - 120	0.213	0	20

The following samples were analyzed in this batch:HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 207171 (0)		Instrument: UV-2450		Method: AMMONIA AS N BY SM4500 NH3-B-F-2011					
MBLK	Sample ID: MBLK-207171	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824897		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	U	0.050							
LCS	Sample ID: LCS-207171	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824896		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.487	0.050	0.5	0	97.4	85 - 115			
MS	Sample ID: HS24020050-03MS	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824894		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.817	0.050	0.5	0.314	101	80 - 120			
MS	Sample ID: HS24020050-02MS	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824892		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.755	0.050	0.5	0.307	89.6	80 - 120			
MSD	Sample ID: HS24020050-03MSD	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824895		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.817	0.050	0.5	0.314	101	80 - 120	0.817	0	20
MSD	Sample ID: HS24020050-02MSD	Units: mg/L		Analysis Date: 09-Feb-2024 17:00					
Client ID:	Run ID: UV-2450_458523		SeqNo: 7824893		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.792	0.050	0.5	0.307	97.0	80 - 120	0.755	4.78	20
The following samples were analyzed in this batch: HS24011577-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: 207188 (0)		Instrument: WetChem_HS		Method: TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011					
MBLK	Sample ID: MBLK-207188	Units: mg/L			Analysis Date: 09-Feb-2024 15:00				
Client ID:	Run ID: WetChem_HS_458506		SeqNo: 7824458		PrepDate: 08-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl U 0.50									
LCS	Sample ID: LCS-207188	Units: mg/L			Analysis Date: 09-Feb-2024 15:00				
Client ID:	Run ID: WetChem_HS_458506		SeqNo: 7824457		PrepDate: 08-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl 20.63 0.50 20 0 103 85 - 115									
MS	Sample ID: HS24020146-02MS	Units: mg/L			Analysis Date: 09-Feb-2024 15:00				
Client ID:	Run ID: WetChem_HS_458506		SeqNo: 7824455		PrepDate: 08-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl 19.71 0.50 20 0.228 97.4 75 - 125									
MSD	Sample ID: HS24020146-02MSD	Units: mg/L			Analysis Date: 09-Feb-2024 15:00				
Client ID:	Run ID: WetChem_HS_458506		SeqNo: 7824456		PrepDate: 08-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl 19.7 0.50 20 0.228 97.4 75 - 125 19.71 0.0812 20									
The following samples were analyzed in this batch: HS24011577-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R457570 (0)		Instrument: WetChem_HS		Method: COLOR BY SM 2120B - 2011					
MBLK	Sample ID: MBLK-R457570	Units: Color Units		Analysis Date: 30-Jan-2024 18:05					
Client ID:	Run ID: WetChem_HS_457570		SeqNo: 7803815		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	U	5.00							

LCS	Sample ID: LCS-R457570	Units: Color Units		Analysis Date: 30-Jan-2024 18:05					
Client ID:	Run ID: WetChem_HS_457570		SeqNo: 7803814		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115			

LCSD	Sample ID: LCSD-R457570	Units: Color Units		Analysis Date: 30-Jan-2024 18:05					
Client ID:	Run ID: WetChem_HS_457570		SeqNo: 7803813		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115	50	0	20

DUP	Sample ID: HS24011577-01DUP	Units: Color Units		Analysis Date: 30-Jan-2024 18:05					
Client ID: OF001 WK 2	Run ID: WetChem_HS_457570		SeqNo: 7803816		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	35	5.00					35	0	20

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457584 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 30-Jan-2024 12:33					
Client ID:	Run ID: ICS-Integrion_457584		SeqNo: 7804246		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	U	0.100							
Chloride	U	0.500							
Fluoride	U	0.100							
Nitrogen, Nitrate (As N)	U	0.100							
Nitrogen, Nitrite (As N)	U	0.100							
Nitrate/Nitrite (as N)	U	0.200							
Sulfate	U	0.500							

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 30-Jan-2024 12:45					
Client ID:	Run ID: ICS-Integrion_457584		SeqNo: 7804247		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	4.037	0.100	4	0	101	90 - 110			
Chloride	20.31	0.500	20	0	102	90 - 110			
Fluoride	3.943	0.100	4	0	98.6	90 - 110			
Nitrogen, Nitrate (As N)	4.088	0.100	4	0	102	90 - 110			
Nitrogen, Nitrite (As N)	4.022	0.100	4	0	101	90 - 110			
Nitrate/Nitrite (as N)	8.11	0.200	8	0	101	90 - 110			
Sulfate	20.39	0.500	20	0	102	90 - 110			

MS	Sample ID: HS24011587-01MS	Units: mg/L		Analysis Date: 30-Jan-2024 14:12					
Client ID:	Run ID: ICS-Integrion_457584		SeqNo: 7804259		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	4.004	0.500	10	0	40.0	80 - 120			S
Chloride	277.9	2.50	50	230	95.8	80 - 120			O
Fluoride	10.03	0.500	10	1.068	89.6	80 - 120			
Nitrogen, Nitrate (As N)	11.48	0.500	10	1.916	95.7	80 - 120			
Nitrogen, Nitrite (As N)	8.79	0.500	10	0	87.9	80 - 120			
Nitrate/Nitrite (as N)	20.27	1.00	20	1.916	91.8	80 - 120			
Sulfate	555.8	2.50	50	524.3	62.9	80 - 120			SEO

Client:ChampionX LLC

Project:2024 Permit Renewal-WK2

WorkOrder:HS24011577

QC BATCH REPORT

Batch ID: R457584 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993						
MS		Sample ID: HS24011573-01MS		Units: mg/L		Analysis Date: 30-Jan-2024 13:08				
Client ID:		Run ID: ICS-Integrion_457584		SeqNo: 7804251		PrepDate:		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromide	27.61	1.00	20	10.11	87.5	80 - 120				
Chloride	590.4	5.00	100	504.9	85.5	80 - 120				O
Fluoride	23.27	1.00	20	4.791	92.4	80 - 120				
Nitrogen, Nitrate (As N)	18.84	1.00	20	0	94.2	80 - 120				
Nitrogen, Nitrite (As N)	17.55	1.00	20	0	87.8	80 - 120				
Nitrate/Nitrite (as N)	36.39	2.00	40	0	91.0	80 - 120				
Sulfate	666.7	5.00	100	578.7	88.0	80 - 120				O

MSD		Sample ID: HS24011587-01MSD		Units: mg/L		Analysis Date: 30-Jan-2024 14:18				
Client ID:		Run ID: ICS-Integrion_457584		SeqNo: 7804260		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromide	4.395	0.500	10	0	44.0	80 - 120	4.004	9.32	20	S
Chloride	277.6	2.50	50	230	95.1	80 - 120	277.9	0.13	20	O
Fluoride	10.03	0.500	10	1.068	89.6	80 - 120	10.03	0.0199	20	
Nitrogen, Nitrate (As N)	11.52	0.500	10	1.916	96.0	80 - 120	11.48	0.283	20	
Nitrogen, Nitrite (As N)	8.77	0.500	10	0	87.7	80 - 120	8.79	0.228	20	
Nitrate/Nitrite (as N)	20.29	1.00	20	1.916	91.8	80 - 120	20.27	0.0616	20	
Sulfate	555.4	2.50	50	524.3	62.2	80 - 120	555.8	0.0684	20	SEO

MSD		Sample ID: HS24011573-01MSD		Units: mg/L		Analysis Date: 30-Jan-2024 13:14				
Client ID:		Run ID: ICS-Integrion_457584		SeqNo: 7804252		PrepDate:		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromide	27.26	1.00	20	10.11	85.7	80 - 120	27.61	1.3	20	
Chloride	602.6	5.00	100	504.9	97.7	80 - 120	590.4	2.05	20	O
Fluoride	23.69	1.00	20	4.791	94.5	80 - 120	23.27	1.79	20	
Nitrogen, Nitrate (As N)	19.24	1.00	20	0	96.2	80 - 120	18.84	2.1	20	
Nitrogen, Nitrite (As N)	17.9	1.00	20	0	89.5	80 - 120	17.55	1.99	20	
Nitrate/Nitrite (as N)	37.14	2.00	40	0	92.9	80 - 120	36.39	2.05	20	
Sulfate	680.3	5.00	100	578.7	102	80 - 120	666.7	2.01	20	O

The following samples were analyzed in this batch:HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R457806 (0)		Instrument: Skalar 02		Method: DISSOLVED OXYGEN BY SM4500-O G					
DUP	Sample ID: HS24011577-01DUP	Units: mg/L		Analysis Date: 01-Feb-2024 14:45					
Client ID: OF001 WK 2	Run ID: Skalar 02_457806		SeqNo: 7809180		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Oxygen, Dissolved	6.1	1.00					6.01	1.49	20
The following samples were analyzed in this batch: HS24011577-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457906 (0)		Instrument: WetChem_HS		Method: RESIDUAL CHLORINE BY SM4500CL F-2011					
MBLK	Sample ID: MBLK-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811299		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	U	0.10							

LCS	Sample ID: LCS-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811298		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.5	0.10	3.66	0	95.6	85 - 115			

LCSD	Sample ID: LCSD-R457906	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID:	Run ID: WetChem_HS_457906		SeqNo: 7811301		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.6	0.10	3.66	0	98.4	85 - 115	3.5	2.82	20

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 02-Feb-2024 13:35					
Client ID: OF001 WK 2	Run ID: WetChem_HS_457906		SeqNo: 7811300		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.6	0.10	3.66	0	98.4	80 - 120			

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R457940 (0)		Instrument: Balance1		Method: TOTAL SUSPENDED SOLIDS BY SM 2540D-2011						
MBLK	Sample ID: WMBLK-02022024	Units: mg/L		Analysis Date: 02-Feb-2024 13:00						
Client ID:	Run ID: Balance1_457940	SeqNo: 7812320		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		U	2.50							
LCS	Sample ID: WLCS-02022024	Units: mg/L		Analysis Date: 02-Feb-2024 13:00						
Client ID:	Run ID: Balance1_457940	SeqNo: 7812319		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		88	2.50	100	0	88.0	85 - 115			
DUP	Sample ID: HS24011576-02DUP	Units: mg/L		Analysis Date: 02-Feb-2024 13:00						
Client ID:	Run ID: Balance1_457940	SeqNo: 7812310		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		16.29	2.50				16.29	0	20	
DUP	Sample ID: HS24011501-01DUP	Units: mg/L		Analysis Date: 02-Feb-2024 13:00						
Client ID:	Run ID: Balance1_457940	SeqNo: 7812299		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		68	2.50				62.67	8.16	20	
The following samples were analyzed in this batch:		HS24011577-01								

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R458033 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WMBLK-02052024	Units: mg/L		Analysis Date: 05-Feb-2024 10:00						
Client ID:	Run ID: Balance1_458033	SeqNo: 7814292		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	U	2.00								

LCS	Sample ID: LCS-02052024	Units: mg/L		Analysis Date: 05-Feb-2024 10:00						
Client ID:	Run ID: Balance1_458033	SeqNo: 7814290		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	42.3	2.00	40	0	106	78 - 114				

LCSD	Sample ID: LCSD-02052024	Units: mg/L		Analysis Date: 05-Feb-2024 10:00						
Client ID:	Run ID: Balance1_458033	SeqNo: 7814291		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	44.6	2.00	40	0	112	78 - 114	42.3	5.29	18	

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 05-Feb-2024 10:00						
Client ID: OF001 WK 2	Run ID: Balance1_458033	SeqNo: 7814270		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	43.2	2.00	40	2.326	102	78 - 114				

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R458046 (0)		Instrument: WetChem_HS		Method: SULFIDE BY SM4500 S2-F-2011						
MBLK	Sample ID: MBLK-R458046	Units: mg/L		Analysis Date: 05-Feb-2024 16:20						
Client ID:	Run ID: WetChem_HS_458046		SeqNo: 7814493		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Sulfide	U	2.00								

LCS	Sample ID: LCS-R458046	Units: mg/L		Analysis Date: 05-Feb-2024 16:20						
Client ID:	Run ID: WetChem_HS_458046		SeqNo: 7814492		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Sulfide	22.16	2.00	25	0	88.6	85 - 115				

LCSD	Sample ID: LCSD-R458046	Units: mg/L		Analysis Date: 05-Feb-2024 16:20						
Client ID:	Run ID: WetChem_HS_458046		SeqNo: 7814491		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Sulfide	21.96	2.00	25	0	87.8	85 - 115	22.16	0.907	20	

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 05-Feb-2024 16:20						
Client ID: OF001 WK 2	Run ID: WetChem_HS_458046		SeqNo: 7814494		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Sulfide	21.96	2.00	25	-1.44	93.6	80 - 120				

The following samples were analyzed in this batch: HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R458055 (0)		Instrument: WetChem_HS		Method: SULFITE BY SM4500SO3B					
MBLK	Sample ID: MBLK-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814593		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	U	5.00							

LCS	Sample ID: LCS-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814592		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	0	104	80 - 120			

LCSD	Sample ID: LCSD-R458055	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID:	Run ID: WetChem_HS_458055		SeqNo: 7814591		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	0	104	80 - 120	52	0	20

MS	Sample ID: HS24011577-01MS	Units: mg/L		Analysis Date: 05-Feb-2024 16:36					
Client ID: OF001 WK 2	Run ID: WetChem_HS_458055		SeqNo: 7814594		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sulfite	52	5.00	50	1	102	75 - 125			

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R458101 (0)		Instrument: Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011						
MBLK	Sample ID: WMBLK-02052024	Units: mg/L		Analysis Date: 05-Feb-2024 13:00						
Client ID:	Run ID: Balance1_458101	SeqNo: 7815760		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		U	10.0							

LCS	Sample ID: WLCS-02052024	Units: mg/L		Analysis Date: 05-Feb-2024 13:00						
Client ID:	Run ID: Balance1_458101	SeqNo: 7815759		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		1072	10.0	1000	0	107	85 - 115			

DUP	Sample ID: HS24020116-01DUP	Units: mg/L		Analysis Date: 05-Feb-2024 13:00						
Client ID:	Run ID: Balance1_458101	SeqNo: 7815752		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		646	10.0				624	3.46	20	

DUP	Sample ID: HS24011577-01DUP	Units: mg/L		Analysis Date: 05-Feb-2024 13:00						
Client ID: OF001 WK 2	Run ID: Balance1_458101	SeqNo: 7815738		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		286	10.0				270	5.76	20	

The following samples were analyzed in this batch: HS24011577-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK2

WorkOrder:HS24011577

QC BATCH REPORT

Batch ID: R458205 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993					
MBLK	Sample ID: MBLK-R458205	Units: mg/L		Analysis Date: 07-Feb-2024 10:30					
Client ID:	Run ID: WetChem_HS_458205		SeqNo: 7818103		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	U	15.0							

LCS	Sample ID: LCS-R458205	Units: mg/L		Analysis Date: 07-Feb-2024 10:30					
Client ID:	Run ID: WetChem_HS_458205		SeqNo: 7818102		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	99	15.0	100	0	99.0	85 - 115			

MS	Sample ID: HS24011640-02MS	Units: mg/L		Analysis Date: 07-Feb-2024 10:30					
Client ID:	Run ID: WetChem_HS_458205		SeqNo: 7818105		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	88	15.0	50	40	96.0	80 - 120			

MSD	Sample ID: HS24011640-02MSD	Units: mg/L		Analysis Date: 07-Feb-2024 10:30					
Client ID:	Run ID: WetChem_HS_458205		SeqNo: 7818104		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	88	15.0	50	40	96.0	80 - 120	88	0	20

The following samples were analyzed in this batch:HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

QC BATCH REPORT

Batch ID: R458335 (0)		Instrument: TOC_04		Method: TOTAL ORGANIC CARBON - SM5310B-2011						
MBLK	Sample ID: MBLK-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 22:29						
Client ID:	Run ID: TOC_04_458335		SeqNo: 7820710		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS	Sample ID: LCS-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 22:30						
Client ID:	Run ID: TOC_04_458335		SeqNo: 7820725		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.1	1.00	10	0	101	85 - 115				

LCSD	Sample ID: LCSD-02072024	Units: mg/L		Analysis Date: 07-Feb-2024 22:31						
Client ID:	Run ID: TOC_04_458335		SeqNo: 7820726		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.13	1.00	10	0	101	85 - 115	10.1	0.297	20	

MS	Sample ID: HS24011528-24MS	Units: mg/L		Analysis Date: 07-Feb-2024 23:44						
Client ID:	Run ID: TOC_04_458335		SeqNo: 7820813		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	14.22	1.00	10	3.688	105	80 - 120				

The following samples were analyzed in this batch: HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R458405 (0)		Instrument: Skalar 03		Method: ALKALINITY BY -2011					
MBLK	Sample ID: MBLK-02082024	Units: mg/L		Analysis Date: 08-Feb-2024 15:25					
Client ID:	Run ID: Skalar 03_458405		SeqNo: 7822147		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		U	5.00						

LCS	Sample ID: LCS-02082024	Units: mg/L		Analysis Date: 08-Feb-2024 15:31					
Client ID:	Run ID: Skalar 03_458405		SeqNo: 7822148		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		949.2	5.00	1000	0	94.9	85 - 115		

LCSD	Sample ID: LCSD-02082024	Units: mg/L		Analysis Date: 08-Feb-2024 15:37					
Client ID:	Run ID: Skalar 03_458405		SeqNo: 7822149		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		948.6	5.00	1000	0	94.9	85 - 115	949.2	0.0632 20

DUP	Sample ID: HS24011503-01DUP	Units: mg/L		Analysis Date: 08-Feb-2024 16:04					
Client ID:	Run ID: Skalar 03_458405		SeqNo: 7822154		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		60.1	5.00				59.4	1.17	20

The following samples were analyzed in this batch: HS24011577-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R458407 (0)		Instrument: Skalar 03		Method: PH BY SM4500H+ B-2011					
DUP	Sample ID: HS24011503-01DUP		Units: pH Units		Analysis Date: 08-Feb-2024 16:04				
Client ID:	Run ID: Skalar 03_458407		SeqNo: 7822187		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
pH	7.55	0.100					7.54	0.133	10
Temp Deg C @pH	19.3	0					19.8	2.56	10
The following samples were analyzed in this batch: HS24011577-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK2
HS24011577

QC BATCH REPORT

Batch ID: R458442 (0)		Instrument: ICS-Integrion		Method: NITRATE/NITRITE BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 09-Feb-2024 07:18					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823266		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		U	0.200						

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 09-Feb-2024 07:24					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823267		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		7.936	0.200	8	0	99.2	90 - 110		

MS	Sample ID: HS24020181-01MS	Units: mg/L		Analysis Date: 09-Feb-2024 07:36					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823269		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		17.63	1.00	20	0.154	87.4	80 - 120		

MSD	Sample ID: HS24020181-01MSD	Units: mg/L		Analysis Date: 09-Feb-2024 07:42					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823270		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		17.96	1.00	20	0.154	89.0	80 - 120	17.63	1.88 20

The following samples were analyzed in this batch: HS24011577-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
WorkOrder: HS24011577

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

Sample Receipt Checklist

Work Order ID: HS24011577

Date/Time Received: **29-Jan-2024 13:00**

Client Name: Nalco Freeport

Received by: **Donald Gilmore**

Completed By: <u>/S/ Paresh M. Giga</u>	29-Jan-2024 14:49	Reviewed by: <u>/S/ Andy C. Neir</u>	13-Feb-2024 09:17
eSignature	Date/Time	eSignature	Date/Time

Matrices: **Water**Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	1 Page(s)
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	COC IDs:312464
Samplers name present on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	1.8C/1.7C; 2.3C/2.2C U/c IR31		
Cooler(s)/Kit(s):	51882/Blue		
Date/Time sample(s) sent to storage:	1/29/24 15:10		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:			

Login Notes: All bottles & COC have varied times.
Logged in using earliest time

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 312464

HS24011577

ChampionX LLC
2024 Permit Renewal



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	450443658	Project Name	2024 Permit Renewal
Work Order		Project Number	
Company Name	Nalco Company	Bill To Company	ChampionX LLC
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380
Address	PO Box 2167	Address	PO Box 2167
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542
Phone	(979) 239-5800	Phone	(979) 239-5800
Fax	(979) 233-6767	Fax	(979) 233-6767
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF001 WK2	1/29/24	0646	W	Neat	10	X										
2	OF001 WK2	1/29/24	0734	W	2	1		X									
3	OF001 WK2	1/29/24	0736	W	Neat	1			X								
4	OF001 WK2	1/29/24	0802	W	Neat	1				X							
5	OF001 WK2	1/29/24	0826	W							X						
6	OF001 WK2	1/29/24	0805	W								X					
7	OF001 WK2	1/29/24	0830	W	7	4							X				
8	OF001 WK2	1/29/24	0900	W		1								X			
9	OF001 WK2	1/29/24	0905	W		12									X		
10	OF001 WK2	1/29/24	0906	W												X	

Sampler(s) Please Print & Sign Marilyn Putnam		Shipment Method P/U ALS		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hr		Results Due Date:	
Relinquished by: Marilyn Putnam		Date: 1/29/24	Time: 0915	Received by: D.S.		Notes: Annual Permit Renewal	
Relinquished by: D.S.		Date: 1/29/24	Time: 1300	Received by (Laboratory): D.S.		QC Package: (Check One Box Below)	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Cooler ID 51882 Blue	
Preservative Key:		1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035				<input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW48/CLP <input type="checkbox"/> Other	

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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right solutions.
right partner.

February 12, 2024

Andrew Neir
ALS Environmental
10450 Stancliff Rd
Suite 210
Houston, TX 77099

Work Order: **HN2400126**

Re: **HS24011577**

Dear Andrew,

Enclosed are the results of the sample(s) submitted to our laboratory.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Chelsey Cook

/S/ Chelsey Cook

Project Manager



Narrative Documents

Client: ALS Environmental
Project: HS24011577
Sample Matrix: Water

Work Order: HN2400126
Date Received: 01-Feb-2024

CASE NARRATIVE

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 01-Feb-2024. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Inorganics:

No significant anomalies were noted with this analysis.



Sample Receipt Information

SAMPLE SUMMARY



Client: ALS Environmental
Project: HS24011577
Workorder: HN2400126

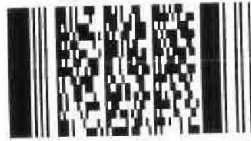
Laboratory Sample ID	Client Sample ID	Sample Matrix	Collection Date	Date Received
HN2400126-001	HS24011577-01 (OF001 WK2)	WATER	01/29/24 06:46	02/01/24 09:30
HN2400126-002	HS24011577-02 (LL Hg Dup)	WATER	01/29/24 06:46	02/01/24 09:30
HN2400126-003	HS24011577-03 (LL Hg Field Blank)	WATER	01/29/24 06:46	02/01/24 09:30



Environmental Division
Holland
Work Order Reference
HN2400126

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcon



ody

SAMPLING STATE: Texas

COC ID: 24569

Telephone : +1 616 399 6070

SUBCONTRACT TO:

ALS Laboratory Group
3352 128th Ave.
Holland, MI 494249263

Phone: +1 616 399 6070

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com


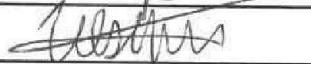
**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011577
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS24011577-01	OF001 WK 2	Water	29 Jan 2024 06:46
	SUB_Available Cyanide			12 Feb 2024
	Sub_MercuryLow			12 Feb 2024
2.	HS24011577-02	LL Hg Duplicate	Water	29 Jan 2024 06:46
	Sub_MercuryLow			12 Feb 2024
3.	HS24011577-03	LL Hg Field Blank	Water	29 Jan 2024 06:46
	Sub_MercuryLow			12 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: 
Received By: 
Cooler ID(s): _____

Date/Time: 1/31/24 1800-
Date/Time: 2/1/24 930
Temperature(s): 4.0°C DF2
PXUR

ALS Holland Sample Receiving Checklist

Received by:

[Signature]

Date/Time:

2/1/24 930

Carrier Name:

Fedex

Shipping container/cooler in good condition?

☒ Yes / ☒ No / ☒ Not Present

Custody seals intact on shipping container/cooler?

☒ Yes / ☒ No / ☒ Not Present

Custody seals intact on sample bottles?

☒ Yes / ☒ No / ☒ Not Present

Chain of Custody present?

☒ Yes / ☒ No

COC signed when relinquished and received?

☒ Yes / ☒ No

COC agrees with sample labels?

☒ Yes / ☒ No

Samples in proper container/bottle?

☒ Yes / ☒ No

Sample containers intact?

☒ Yes / ☒ No

Sufficient sample volume for indicated test?

☒ Yes / ☒ No

All samples received within holding time?

☒ Yes / ☒ No

Container/Temp Blank temperature in compliance?

☒ Yes / ☒ No

Temperature(s) (°C):

4.0°C

Thermometer(s):

DF2

Sample(s) received on ice?

☒ Yes / ☒ No

Matrix/Matrices:

Water

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

2/1/24 1145

Water – VOA vials have zero headspace?

☒ Yes / ☒ No / ☒ No Vials

Water – pH acceptable upon receipt?

☒ Yes / ☒ No ☒ N/A

pH strip lot #: 36 < 2 _____ > 12 _____ Other _____

pH adjusted (note adjustments below)?

☒ Yes / ☒ No ☒ N/A

pH adjusted by:

Login Notes:



Miscellaneous Forms

REPORT QUALIFIERS AND DEFINITIONS

*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Holland Laboratory Certifications

Agency	Type	ID	Issued	Expires
Alabama	Drinking Water (Secondary)	42500	6/27/2023	12/31/2023
Colorado	UST		1/1/2024	6/30/2024
Connecticut	Drinking Water (Secondary)	PH-0155	1/23/2023	12/31/2024
Florida	NELAP (Primary)	E871106	6/28/2023	6/30/2024
Illinois	NELAP (Secondary)	200076	12/14/2023	12/31/2024
Indiana	Drinking Water (Secondary)	C-MI-08	7/6/2021	12/31/2023
Iowa	State Specific	403	9/18/2023	9/1/2025
Kansas	NELAP (Secondary)	E-10411	7/26/2023	7/31/2024
Kentucky	Waste Water	KY98004	12/5/2023	12/31/2024
Kentucky	UST	120474	7/6/2023	6/30/2024
Michigan	Drinking Water (Primary)	0022	12/19/2023	9/4/2026
Minnesota	NELAP (Secondary)	026-999-449	12/29/2023	12/31/2024
New Jersey	NELAP (Secondary)	MI015	6/5/2023	6/30/2024
New York	Drinking Water (Secondary)	12128	4/1/2023	4/1/2024
North Dakota	State Specific	R-192	9/12/2023	6/30/2024
Ohio	Drinking Water (Secondary)	87783	7/5/2023	6/30/2024
Pennsylvania	NELAP (Secondary)	68-03827	12/21/23	7/31/2024
Texas	NELAP (Secondary)	T104704494	2/1/2024	1/31/2025
USDA	Domestic CA	Soil-MI-007	8/21/2023	2/18/2025
USDA	Soil Import	P330-19-00039	3/3/2023	3/3/2026
West Virginia	State Specific	355	8/25/2023	8/31/2024
Wisconsin	State Specific	399084510	8/11/2023	8/31/2024

Holland Aquatic Toxicity Certifications

Agency	Type	ID	Issued	Expires
New Jersey	NELAP (Secondary)	MI013	6/21/2023	6/30/2024
New York	NELAP (Secondary)	12171	4/7/2023	4/1/2024
Pennsylvania	NELAP (Primary)	68-04227	10/27/2023	11/30/2024

ANALYST SUMMARY



Client: ALS Environmental
Project: HS24011577

Work Order: HN2400126

Sample Name: HS24011577-01 (OF001 WK2)
Laboratory Code: HN2400126-001
Sample Matrix: WATER

Date Collected: 01/29/24
Date Received: 02/01/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1322997	Kate Achatz	2047713	Kate Achatz
OIA 1677	1320755	Mike Burkall	2042857	Mike Burkall

Sample Name: HS24011577-02 (LL Hg Dup)
Laboratory Code: HN2400126-002
Sample Matrix: WATER

Date Collected: 01/29/24
Date Received: 02/01/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1322997	Kate Achatz	2047713	Kate Achatz

Sample Name: HS24011577-03 (LL Hg Field Blank)
Laboratory Code: HN2400126-003
Sample Matrix: WATER

Date Collected: 01/29/24
Date Received: 02/01/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1322997	Kate Achatz	2047713	Kate Achatz



Sample Results



Metals

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Sample Name: HS24011577-01 (OF001 WK2)
Laboratory Code: HN2400126-001

Work Order: HN2400126
Date Collected: 01/29/24 06:46
Date Received: 02/01/24 09:30

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 13:10	02/05/24 14:54	

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Sample Name: HS24011577-02 (LL Hg Dup)
Laboratory Code: HN2400126-002

Work Order: HN2400126
Date Collected: 01/29/24 06:46
Date Received: 02/01/24 09:30

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 13:41	02/05/24 14:54	

Analytical Report

Client: ALS Environmental

Project: HS24011577/

Sample Matrix: WATER

Work Order: HN2400126

Date Collected: 01/29/24 06:46

Date Received: 02/01/24 09:30

Sample Name: HS24011577-03 (LL Hg Field Blank)

Laboratory Code: HN2400126-003

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 13:49	02/05/24 14:54	



General Chemistry

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Sample Name: HS24011577-01 (OF001 WK2)
Laboratory Code: HN2400126-001

Work Order: HN2400126
Date Collected: 01/29/24 06:46
Date Received: 02/01/24 09:30

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Available Cyanide	OIA 1677	0.860 U	µg/L	2.00	0.860	1	02/02/24 10:04	02/02/24 10:02	



QC Summary Forms



Metals

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Work Order: HN2400126

Date Collected: NA

Date Received: NA

Sample Name: Method Blank
Laboratory Code: QC-1322997-001

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 11:52	02/05/24 14:55	

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Work Order: HN2400126

Date Collected: NA

Date Received: NA

Sample Name: Method Blank
Laboratory Code: QC-1322997-002

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 12:23	02/05/24 14:55	

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1322997-003

Work Order: HN2400126
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.240 J	ng/L	0.500	0.200	1	02/06/24 12:54	02/05/24 14:55	

Analytical Report

Client: ALS Environmental
Project: HS24011577/
Sample Matrix: WATER

Work Order: HN2400126

Date Collected: NA

Date Received: NA

Sample Name: Method Blank
Laboratory Code: QC-1322997-004

Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	0.200 U	ng/L	0.500	0.200	1	02/06/24 13:26	02/05/24 14:55	

QA/QC Report

Client: ALS Environmental
Project: HS24011577
Sample Matrix: WATER

Work Order: HN2400126
Date Collected: 01/29/2024
Date Received: 02/01/2024
Date Analyzed: 02/06/2024
Date Extracted: 02/05/2024

Duplicate Matrix Spike Summary
Metals

Sample Name: HS24011577-01 (OF001 WK2) Units: ng/L
Laboratory Code: HN2400126-001 Analysis Lab Lot:2047713
Analysis Method: EPA 1631E
Prep Method: Method

Matrix Spike Duplicate Matrix Spike
QC-1322997-008 QC-1322997-009

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Mercury	0.200 U	4.30	5	84.2	5.04	5	99.0	71-125	15.8	24

QA/QC Report

Client: ALS Environmental
Project: HS24011577
Sample Matrix: WATER

Work Order:HN2400126
Date Analyzed:02/06/2024
Date Extracted:02/05/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2047713

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1322997-005	5.23	5	105	77-123

QA/QC Report

Client: ALS Environmental
Project: HS24011577
Sample Matrix: WATER

Work Order:HN2400126
Date Analyzed:02/06/2024
Date Extracted:02/05/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2047713

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1322997-006	5.85	5	117	77-123



General Chemistry

Analytical Report

Client:

Project:

Sample Matrix:

Sample Name:

Laboratory Code:

ALS Environmental
HS24011577/
WATER
Method Blank
QC-1320755-001

Work Order:

Date Collected:

Date Received:

HN2400126
NA
NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Available Cyanide	OIA 1677	0.860 U	µg/L	2.00	0.860	1	02/02/24 10:05	02/02/24 10:03	

QA/QC Report

Client: ALS Environmental
Project: HS24011577
Sample Matrix: WATER

Work Order:HN2400126
Date Analyzed:02/02/2024
Date Extracted:02/02/2024

Laboratory Control Sample Summary
Available Cyanide

Analysis Method: OIA 1677
Prep Method: Method

Units:µg/L
Analysis Lab Lot:2042857

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1320755-002	46.0	50	92.0	82-132

Laboratory Analysis Report

Total Number of Pages: 8

Job ID : 24012877



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

Client Project Name : HS24011577

Report To :	Client Name:	ALS Group USA, Corp.	P.O.#:
	Attn:	Andy C. Neir	Sample Collected By:
	Client Address:	10450 Stancliff Rd., Ste. 210	Date Collected: 01/29/24
	City, State, Zip:	Houston, Texas, 77099	

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
HS24011577-01 / OF001 WK 2	Water	24012877.01

A handwritten signature in black ink, appearing to read 'S. C. W. K.'.

Released By: Senthilkumar Sevukan
Title: Vice President Operations
Date: 2/5/2024



This Laboratory is NELAP (T104704213-23-31) accredited. Effective: 04/13/2023; Expires: 3/31/2024
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Results apply to the sample as received. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

ab-q210-0321

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 24012877

Date: 2/5/2024

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
J	Estimation. Below calibration range but above MDL	RptLimit	Reporting Limit
LCS	Laboratory Check Standard	SDL	Sample Detection Limit
LCSD	Laboratory Check Standard Duplicate	surr	Surrogate
MS	Matrix Spike	T	Time
MSD	Matrix Spike Duplicate	TNTC	Too numerous to count
MW	Molecular Weight	UQL	Unadjusted Upper Quantitation Limit
MQL	Unadjusted Minimum Quantitation Limit		

Qualifier Definition

H3	Sample was received and analyzed past holding time.
----	---

**LABORATORY TEST RESULTS**

Job ID : 24012877

Date 2/5/2024

Client Name: ALS Group USA, Corp.

Attn: Andy C. Neir

Project Name: HS24011577

Client Sample ID: HS24011577-01 / OF001 WK 2

Job Sample ID: 24012877.01

Date Collected: 01/29/24

Sample Matrix Water

Time Collected: 06:46

Other Information:

Test Method	Parameter/Test Description	Result	Units	DF	Rpt Limit	Reg Limit	Q	Date Time	Analyst
SM 9223B	E. coli								
	E. coli	38	mpn/100mL	4	4		H3	01/29/24 15:30	SIB
SM 9230C									
	Enterococci	BRL	cfu/100mL	4	4		H3	01/29/24 16:00	SIB
SW-846 8315A	Aldehydes by HPLC								
	Formaldehyde	BRL	mg/L	1	0.04			02/01/24 15:28	ARM

QUALITY CONTROL CERTIFICATE



Job ID : 24012877

Date : 2/5/2024

Analysis : E. coli **Method :** SM 9223B **Reporting Units :** mpn/100mL
QC Batch ID : Qb24013042 **Created Date :** 01/29/24 **Created By :** Sindhu
Samples in This QC Batch : 24012877.01

QC Type: Method Blank							
Parameter	CAS #	Result	Units	D.F.	RptLimit		Qual
E. coli		BRL	mpn/100mL	1	1		
E. coli		BRL	mpn/100mL	4	4		

QC Type: Duplicate							
QC Sample ID: 24012837.01							
Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrLimit		Qual
E. coli	149	155	mpn/100m	4	40		

QUALITY CONTROL CERTIFICATE



Job ID : 24012877

Date : 2/5/2024

Analysis : **Method :** SM 9230C **Reporting Units :** cfu/100mL

QC Batch ID : Qb24013062 **Created Date :** 01/29/24 **Created By :** Sindhu

Samples in This QC Batch : 24012877.01

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	RptLimit	Qual
Enterococci		BRL	cfu/100mL	4	4	

QC Type: Duplicate

QC Sample ID: 24012855.01

Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrlLimit	Qual
Enterococci	BRL	BRL	cfu/100mL	0	40	

QUALITY CONTROL CERTIFICATE



Job ID : 24012877

Date : 2/5/2024

Analysis : Aldehydes by HPLC Method : SW-846 8315A Reporting Units : mg/L

QC Batch ID : Qb24020262 Created Date : 02/01/24 Created By : AMarapadaga

Samples in This QC Batch : 24012877.01

Extraction : PB24020111 Prep Method : SW-846 8315A Prep Date : 01/31/24 10:30 Prep By : Msoria

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	RptLimit	Qual
Formaldehyde	50-00-0	BRL	mg/L	1	0.04	

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
Formaldehyde	0.12	0.13	108	0.12	0.13	108	1.3	35	36-140	

QC Type: MS and MSD

QC Sample ID: 24012877.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Formaldehyde	BRL	0.12	0.11	91.7						10-160	



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24564

SUBCONTRACT TO:

A&B Environmental
10100 East Freeway, Ste 100
Houston, TX 77029

Phone: +1 713 453 6060

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011577
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24011577-01	OF001 WK 2	Water	29 Jan 2024 06:46
SUB_E. Coli			12 Feb 2024
SUB_Enterococci			12 Feb 2024
SUB_FORMALDEHYDE			12 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Job ID:24012877



01/28/2024 ALS Group USA, Corp. ACH

Relinquished By: DJ
Received By: Asmith
Cooler ID(s): _____

Date/Time: 1-29-24 14:45
Date/Time: 1/29/24 14:45
Temperature(s): 5.1°C 125



Sample Condition Checklist

A&B JobID : 24012877		Date Received : 01/29/2024		Time Received : 2:45PM								
Client Name : ALS Group USA, Corp.												
Temperature : 5.1°C		Sample pH : NA										
Thermometer ID : IR5		pH Paper ID : NA										
Perservative :		Lot# :										
	Check Points				Yes	No	N/A					
1.	Cooler Seal present and signed.					X						
2.	Sample(s) in a cooler.				X							
3.	If yes, ice in cooler.				X							
4.	Sample(s) received with chain-of-custody.				X							
5.	C-O-C signed and dated.				X							
6.	Sample(s) received with signed sample custody seal.					X						
7.	Sample containers arrived intact. (If No comment)				X							
8.	Matrix:	Water	Soil	Liquid	Sludge	Solid	Cassette	Tube	Bulk	Badge	Food	Other
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Samples were received in appropriate container(s)				X							
10.	Sample(s) were received with Proper preservative				X							
11.	All samples were tagged or labeled.				X							
12.	Sample ID labels match C-O-C ID's.				X							
13.	Bottle count on C-O-C matches bottles found.				X							
14.	Sample volume is sufficient for analyses requested.				X							
15.	Samples were received with in the hold time.				X							
16.	VOA vials completely filled.						X					
17.	Sample accepted.				X							
18.	Has client been contacted about sub-out						X					

Comments : Include actions taken to resolve discrepancies/problem:

--

Brought by : Client
Received by : ASmith

Check in by/date : ASmith / 01/29/2024

ab-s005-1123

ALS Environmental - Houston, TX

Sample Delivery Group: L1700423

Samples Received: 01/30/2024

Project Number:

Description:

Report To: Andy Neir
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Entire Report Reviewed By:



Reagan Johnson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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RIGHT SOLUTIONS | RIGHT PARTNER

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SAMPLE SUMMARY

OF001 WK 2 L1700423-01 WW

Collected by
Collected date/time
Received date/time

01/29/24 06:46
01/30/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 218.6M	WG2214217	1	01/31/24 08:27	01/31/24 08:27	SET	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Tr

⁶Sr

⁷Qc

⁸Gl

⁹Al

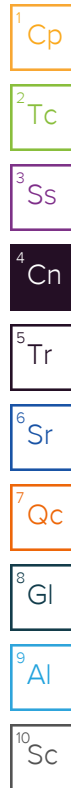
¹⁰Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Reagan Johnson
Project Manager



Laboratory Data Package Cover Page

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
 - a. Items consistent with NELAC Chapter 5,
 - b. dilution factors,
 - c. preparation methods,
 - d. cleanup methods, and
 - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
 - a. Calculated recovery (%R), and
 - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
 - a. LCS spiking amounts,
 - b. Calculated %R for each analyte, and
 - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a. Samples associated with the MS/MSD clearly identified,
 - b. MS/MSD spiking amounts,
 - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d. Calculated %Rs and relative percent differences (RPDs), and
 - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
 - a. The amount of analyte measured in the duplicate,
 - b. The calculated RPD, and
 - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.



Reagan Johnson
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National		LRC Date: 01/31/2024 17:39					
Project Name:		Laboratory Job Number: L1700423-01					
Reviewer Name: Reagan Johnson		Prep Batch Number(s): WG2214217					
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National			LRC Date: 01/31/2024 17:39				
Project Name:			Laboratory Job Number: L1700423-01				
Reviewer Name: Reagan Johnson			Prep Batch Number(s): WG2214217				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?			X		
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National		LRC Date: 01/31/2024 17:39	
Project Name:		Laboratory Job Number: L1700423-01	
Reviewer Name: Reagan Johnson		Prep Batch Number(s): WG2214217	
ER # ¹	Description		
The Exception Report intentionally left blank, there are no exceptions applied to this SDG.			
1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period. 2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable); 3. NA = Not applicable; 4. NR = Not reviewed; 5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).			

Wet Chemistry by Method 218.6M

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Hexavalent Chromium	0.00103		0.000150	0.000500	0.000500	1	01/31/2024 08:27	WG2214217

- 1Cp
- 2Tc
- 3Ss
- 4Cn
- 5Tr
- 6Sr
- 7Qc
- 8Gl
- 9Al
- 10Sc

Method Blank (MB)

(MB) R4028149-1 01/31/24 03:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexavalent Chromium	U		0.000150	0.000500

L1698349-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1698349-01 01/31/24 04:58 • (DUP) R4028149-3 01/31/24 05:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.00140	0.00140	1	0.157		20

L1699480-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1699480-01 01/31/24 06:48 • (DUP) R4028149-6 01/31/24 06:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4028149-2 01/31/24 03:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	0.00200	0.00217	109	90.0-110	

L1698372-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1698372-01 01/31/24 05:31 • (MS) R4028149-4 01/31/24 05:42 • (MSD) R4028149-5 01/31/24 05:53

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.0500	U	0.0520	0.0523	104	105	1	90.0-110			0.460	20

L1699811-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1699811-01 01/31/24 07:54 • (MS) R4028149-7 01/31/24 08:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	0.0500	U	0.0537	107	1	90.0-110	

1

Cp

2

Tc

3

Ss

4

Cn

5

Tr

6

Sr

7

Qc

8

Gl

9

Al

10

Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

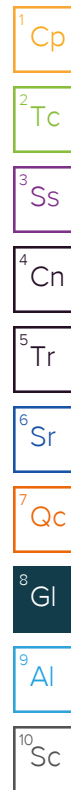
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.



ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





Subcontract Chain of Custody

10450 Stancilff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

SAMPLING STATE: Texas

COC ID: 24570

SUBCONTRACT TO:

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

H110

Phone: +1 (61) 7 8-58

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011577
TSR: Houston House Acct

LAB SAMPLE ID CLIENT SAMPLE ID
ANALYSIS REQUESTED

1. HS24011577-01 OF001 WK 2
Low-level 218.6-ESC

MATRIX COLLECT DATE
DUE DATE

Water 29 Jan 2024 06:46
12 Feb 2024

201

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

PH-10BDH46021 TRC-2362.36
CR6-20221V

Sample Receipt Checklist
COC Seal Present/Intact: ☒ Y ☐ N If Applicable
COC Signed/Accurate: ☒ Y ☐ N VOA Zero Headspace: ☒ Y ☐ N
Bottles arrive intact: ☒ Y ☐ N Pres. Correct/Check: ☒ Y ☐ N
Correct bottles used: ☒ Y ☐ N
Sufficient volume sent: ☒ Y ☐ N
RA Screen <0.5 mR/hr: ☒ Y ☐ N

78

6862 6801 6724

PPA

0.4 to = 0.4

Relinquished By:

Received By:

Cooler ID(s):

Date/Time:

Date/Time:

Temperature(s):

1/29/24 1800.

1/30/24 0900

PPA 0.4 to = 0.4

Project
1089956

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed02/13/2024
8:08

TABLE OF CONTENTS

This report consists of this Table of Contents and the following pages:

Report Name	Description	Pages
1089956_r02_01_ProjectSamples	SPL Kilgore Project P:1089956 C:ALS8 Project Sample Cross Reference t:304	1
1089956_r03_03_ProjectResults	SPL Kilgore Project P:1089956 C:ALS8 Project Results t:304	2
1089956_r10_05_ProjectQC	SPL Kilgore Project P:1089956 C:ALS8 Project Quality Control Groups	1
1089956_r99_09_CoC__1_of_1	SPL Kilgore CoC ALS8 1089956_1_of_1	3
Total Pages:		7



SAMPLE CROSS REFERENCE

Project

1089956

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed

2/13/2024

Page 1 of 1
ww

Sample	Sample ID	Taken	Time	Received
2268763	HS24011577-01 OF001 WK2	01/29/2024	06:46:00	02/01/2024

Bottle 01 client supplied 40 ml glass vial(zero headspace)
Bottle 02 client supplied 40 ml glass vial(zero headspace)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 1671	01	1103646	02/08/2024	1103646	02/08/2024

Email: Kilgore.projectmanager@spl-inc.com



ALS8-G

Page 1 of 2

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project

1089956

Printed: 02/13/2024

RESULTS

Sample Results

2268763	HS24011577-01 OF001 WK2	Received:	02/01/2024
Non-Potable Water	Collected by: Client	ALS Group USA Corp.	PO:
	Taken: 01/29/2024	06:46:00	

EPA 1671		Prepared:	1103646	02/08/2024	18:34:00	Analyzed	1103646	02/08/2024	18:34:00	KAP
	Parameter	Results	Units	RL		Flags	CAS			Bottle
z	Diethylamine	<50.0	mg/L	50.0			109-89-7			01
z	Dimethylamine	<50.0	mg/L	50.0			124-40-3			01
z	Methylamine	<500	mg/L	500		SPD	74-89-5			01
z	Trimethylamine	<500	mg/L	500		PD	75-50-3			01

Sample Preparation

2268763	HS24011577-01 OF001 WK2	Received:	02/01/2024
	01/29/2024		

	Prepared:	02/01/2024	17:05:02	Calculated	02/01/2024	17:05:02	CAL
z	Environmental Fee (per Project)	Verified					

	Cooler Return	Prepared:	02/02/2024	16:00:00	Analyzed	02/02/2024	16:00:00	DRS
z	Return Cooler/No bottles Require	returned						

EPA 1671		Prepared:	1103646	02/08/2024	18:34:00	Analyzed	1103646	02/08/2024	18:34:00	KAP
z	Amines by 1671	Entered								01



ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Page 2 of 2

Project
1089956

Printed: 02/13/2024

Qualifiers:

D - Duplicate RPD was higher than expected P - Spike recovery outside control limits due to matrix effects.
S - Standard reads lower than desired

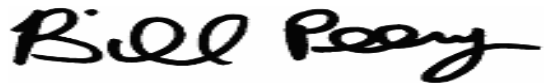
We report results on an As Received (or Wet) basis unless marked Dry Weight.

Unless otherwise noted, testing was performed at SPL, Inc.- Kilgore laboratory which holds International, Federal, and state accreditations. Please see our Websites for details.

(N)ELAC - Covered in our NELAC scope of accreditation
z -- Not covered by our NELAC scope of accreditation

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of SPL Kilgore. Unless otherwise specified, these test results meet the requirements of NELAC.

RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.



Bill Peery, MS, VP Technical Services



QUALITY CONTROL



Page 1 of 1

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project
1089956

Printed 02/13/2024

Analytical Set 1103646

EPA 1671

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Diethylamine	1103646	ND	25.0	50.0	mg/L	125968588
Dimethylamine	1103646	ND	50.0	50.0	mg/L	125968588
Methylamine	1103646	ND	500	500	mg/L	125968588
Trimethylamine	1103646	ND	500	500	mg/L	125968588

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Diethylamine	992	1000	mg/L	99.2	60.0 - 140	125968587
Diethylamine	902	1000	mg/L	90.2	60.0 - 140	125968592
Methylamine	1070	1000	mg/L	107	60.0 - 140	125968587
Methylamine	384	1000	mg/L	38.4	60.0 - 140 *	125968592
Trimethylamine	921	1000	mg/L	92.1	60.0 - 140	125968587
Trimethylamine	1400	1000	mg/L	140	60.0 - 140	125968592

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Diethylamine	2268763	905	1270	84.5	1000	50.0 - 150	82.0	119	mg/L	36.4 *	30.0
Methylamine	2268763	628	1350	ND	1000	50.0 - 130	62.8	135 *	mg/L	73.0 *	30.0
Trimethylamine	2268763	939	1400	ND	1000	50.0 - 130	93.9	140 *	mg/L	39.4 *	30.0

* Out RPD is Relative Percent Difference: $\text{abs}(r_1 - r_2) / \text{mean}(r_1, r_2) * 100\%$

Recover% is Recovery Percent: $\text{result} / \text{known} * 100\%$

Blank - Method Blank (reagent water or other blank matrices that contains all reagents except standard(s) and is processed simultaneously with and under the same conditions as samples; carried through preparation and analytical procedures exactly like a sample; monitors); CCV - Continuing Calibration Verification (same standard used to prepare the curve; typically a mid-range concentration; verifies the continued validity of the calibration curve); MSD - Matrix Spike Duplicate (replicate of the matrix spike; same solution and amount of target analyte added to the MS is added to a third aliquot of sample; quantifies matrix bias and precision.)



Report Page 5 of 8

1089956 CoC Print Group 001 of 001



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody**SAMPLING STATE:** Texas**COC ID:** 24571**SUBCONTRACT TO:**

SPL
2600 Dudley Rd
Kilgore, TX 75662

Phone: +1 903 984 0551

2268763

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24011577
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24011577-01	OF001 WK 2	Water	29 Jan 2024 06:46
See Quote attsched			12 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

Diethylamine/ Dimethylamine/ Methylamine/ Trimethylamine SPL Quote 131866

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:

Date/Time:

Received By:

Date/Time:

Cooler ID(s):

Kathy Tarver SPL, Inc.

Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

31 Jan 2024

See Attached for
Tracking # and Temp

Report Page 6 of 8

1089956 CoC Print Group 001 of 001



Must Deliver Next Business Day
Time and Temperature Sensitive!

Part # 189469-434 NTW EXP 1024 •

ORIGIN ID:SGRA (281) 530-5656
SAMPLE RECEIVING
ALS GROUP USA CORP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

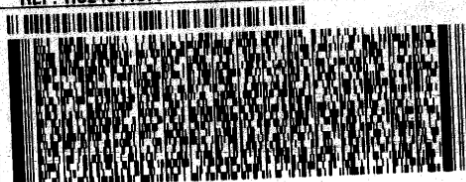
SHIP DATE: 31JAN24
ACTWGT: 4.70 LB
CAD: 0221247/CAFE3755
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
SPL - KILGORE
2600 DUDLEY RD

KILGORE TX 75662

(903) 984-0661

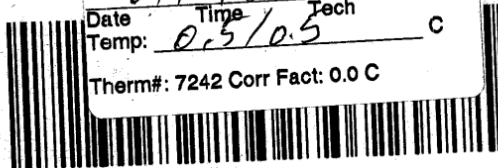
REF: HS24011577 - AN

**FedEx**
Express

an 1021 SHIP/CHRG

TRK# 6862 6801 7308
0201**THU - 01 FEB 10:30A**
PRIORITY OVERNIGHT**AH CCA****75662**
SHV

Date: 2/1/2019 Time: 10:19 Tech: KT
Temp: 0.5/0.5 C
Therm#: 7242 Corr Fact: 0.0 C



Client: ChampionX LLC

Project: 2024 Permit Renewal-WK2

Work Order: HS24011577

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24011577-01	OF001 WK 2	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>
HS24011577-02	LL Hg Duplicate	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>
HS24011577-03	LL Hg Field Blank	Water		29-Jan-2024 06:46	29-Jan-2024 13:00	<input type="checkbox"/>

Client:ChampionX LLC

Project:2024 Permit Renewal-WK2

Sample ID:OF001 WK 2

Collection Date:29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577

Lab ID:HS24011577-01

Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624				Analyst: TS
1,1,1-Trichloroethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,1,2,2-Tetrachloroethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,1,2-Trichloroethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,1-Dichloroethane	U		0.400	5.00	ug/L	1	30-Jan-2024 13:14
1,1-Dichloroethene	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,2-Dibromoethane	U		0.400	5.00	ug/L	1	30-Jan-2024 13:14
1,2-Dichlorobenzene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
1,2-Dichloroethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,2-Dichloropropane	U		0.700	5.00	ug/L	1	30-Jan-2024 13:14
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
1,4-Dichlorobenzene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
2-Butanone	U		1.00	10.0	ug/L	1	30-Jan-2024 13:14
2-Chloroethyl vinyl ether	U		1.30	10.0	ug/L	1	30-Jan-2024 13:14
Acetonitrile	U	n	25.0	50.0	ug/L	1	30-Jan-2024 13:14
Acrolein	U		4.00	20.0	ug/L	1	30-Jan-2024 13:14
Acrylonitrile	U		4.00	10.0	ug/L	1	30-Jan-2024 13:14
Benzene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Benzyl Chloride	U	n	0.500	5.00	ug/L	1	31-Jan-2024 20:40
Bromodichloromethane	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Bromoform	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
Bromomethane	2.33	J	0.500	5.00	ug/L	1	30-Jan-2024 13:14
Carbon disulfide	U	n	0.900	10.0	ug/L	1	30-Jan-2024 13:14
Carbon tetrachloride	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Chlorobenzene	U		0.400	5.00	ug/L	1	30-Jan-2024 13:14
Chloroethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
Chloroform	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Chloromethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
cis-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Dibromochloromethane	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
Dibromomethane	U	n	0.600	5.00	ug/L	1	30-Jan-2024 13:14
Ethylbenzene	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
Hexachlorobutadiene	U	n	1.00	5.00	ug/L	1	30-Jan-2024 13:14
Methylene chloride	U		1.00	10.0	ug/L	1	30-Jan-2024 13:14
Styrene	U	n	0.500	5.00	ug/L	1	30-Jan-2024 13:14
Tetrachloroethene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Toluene	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
trans-1,2-Dichloroethene	U		0.400	5.00	ug/L	1	30-Jan-2024 13:14
trans-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	30-Jan-2024 13:14
Trichloroethene	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	OF001 WK 2	Lab ID:HS24011577-01
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES	Method:E624						Analyst: TS
Vinyl chloride	U		0.400	2.00	ug/L	1	30-Jan-2024 13:14
Xylenes, Total	U		0.500	5.00	ug/L	1	30-Jan-2024 13:14
Total Trihalomethanes (TTHMs)	U	a	0.500	5.00	ug/L	1	30-Jan-2024 13:14
Surr: 1,2-Dichloroethane-d4	112			70-126	%REC	1	30-Jan-2024 13:14
Surr: 1,2-Dichloroethane-d4	76.9			70-126	%REC	1	31-Jan-2024 20:40
Surr: 4-Bromofluorobenzene	96.9			82-124	%REC	1	30-Jan-2024 13:14
Surr: 4-Bromofluorobenzene	98.4			82-124	%REC	1	31-Jan-2024 20:40
Surr: Dibromofluoromethane	107			77-123	%REC	1	30-Jan-2024 13:14
Surr: Dibromofluoromethane	79.4			77-123	%REC	1	31-Jan-2024 20:40
Surr: Toluene-d8	98.0			82-127	%REC	1	30-Jan-2024 13:14
Surr: Toluene-d8	98.9			82-127	%REC	1	31-Jan-2024 20:40

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Sample ID: OF001 WK 2
Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT
WorkOrder:HS24011577
Lab ID:HS24011577-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 30-Jan-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
1,2,4-Trichlorobenzene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
1,2-Dichlorobenzene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
1,2-Diphenylhydrazine	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
1,4-Dichlorobenzene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
2,4,5-Trichlorophenol	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
2,4,6-Trichlorophenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
2,4-Dichlorophenol	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
2,4-Dimethylphenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
2,4-Dinitrophenol	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
2,4-Dinitrotoluene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
2,6-Dichlorophenol	U	n	0.400	5.00	ug/L	1	30-Jan-2024 21:36
2,6-Dinitrotoluene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
2-Chloronaphthalene	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
2-Chlorophenol	U		1.00	5.00	ug/L	1	30-Jan-2024 21:36
2-Methylphenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
2-Nitrophenol	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
3&4-Methylphenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
3,3'-Dichlorobenzidine	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
4,6-Dinitro-2-methylphenol	U		0.900	5.00	ug/L	1	30-Jan-2024 21:36
4-Bromophenyl phenyl ether	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
4-Chloro-3-methylphenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
4-Chlorophenyl phenyl ether	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
4-Nitrophenol	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
Acenaphthene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Acenaphthylene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Anthracene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Benz(a)anthracene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Benzidine	U		5.00	5.00	ug/L	1	30-Jan-2024 21:36
Benzo(a)pyrene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Benzo(b)fluoranthene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Benzo(g,h,i)perylene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Benzo(k)fluoranthene	U		0.700	5.00	ug/L	1	30-Jan-2024 21:36
Bis(2-chloroethoxy)methane	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Bis(2-chloroethyl)ether	U		0.700	5.00	ug/L	1	30-Jan-2024 21:36
Bis(2-chloroisopropyl)ether	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Bis(2-ethylhexyl)phthalate	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Butyl benzyl phthalate	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Sample ID: OF001 WK 2
Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT
WorkOrder:HS24011577
Lab ID:HS24011577-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE	Method:E625			Prep:E625 / 30-Jan-2024		Analyst: GEY	
Chrysene	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Dibenz(a,h)anthracene	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
Diethyl phthalate	U		0.700	5.00	ug/L	1	30-Jan-2024 21:36
Dimethyl phthalate	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
Di-n-butyl phthalate	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Di-n-octyl phthalate	U		2.00	5.00	ug/L	1	30-Jan-2024 21:36
Fluoranthene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Fluorene	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
Hexachlorobenzene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Hexachlorobutadiene	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
Hexachlorocyclopentadiene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Hexachloroethane	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Indeno(1,2,3-cd)pyrene	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
Isophorone	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
Naphthalene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Nitrobenzene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
N-Nitrosodiethylamine	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
N-Nitrosodimethylamine	U		0.600	5.00	ug/L	1	30-Jan-2024 21:36
N-Nitroso-di-n-butylamine	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
N-Nitrosodi-n-propylamine	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
N-Nitrosodiphenylamine	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Nonylphenol	U	n	5.00	5.00	ug/L	1	30-Jan-2024 21:36
Pentachlorobenzene	U		0.500	5.00	ug/L	1	30-Jan-2024 21:36
Pentachlorophenol	U		0.800	5.00	ug/L	1	30-Jan-2024 21:36
Phenanthrene	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Phenol	U		0.400	5.00	ug/L	1	30-Jan-2024 21:36
Pyrene	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Pyridine	U		0.300	5.00	ug/L	1	30-Jan-2024 21:36
Cresols, Total	U	n	0.400	5.00	ug/L	1	30-Jan-2024 21:36
Surr: 2,4,6-Tribromophenol	83.5			42-124	%REC	1	30-Jan-2024 21:36
Surr: 2-Fluorobiphenyl	68.1			48-120	%REC	1	30-Jan-2024 21:36
Surr: 2-Fluorophenol	50.5			20-120	%REC	1	30-Jan-2024 21:36
Surr: 4-Terphenyl-d14	76.0			51-135	%REC	1	30-Jan-2024 21:36
Surr: Nitrobenzene-d5	57.2			41-120	%REC	1	30-Jan-2024 21:36
Surr: Phenol-d6	67.3			20-120	%REC	1	30-Jan-2024 21:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Sample ID: OF001 WK 2
Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT
WorkOrder:HS24011577
Lab ID:HS24011577-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 30-Jan-2024		Analyst: JBA	
4,4'-DDD	U		0.0000760	0.00250	UG/L	1	02-Feb-2024 00:10
4,4'-DDE	U		0.000100	0.00250	UG/L	1	02-Feb-2024 00:10
4,4'-DDT	U		0.000145	0.00250	UG/L	1	02-Feb-2024 00:10
Aldrin	0.000257	J	0.0000340	0.00125	UG/L	1	02-Feb-2024 00:10
alpha-BHC	U		0.00125	0.00125	UG/L	1	02-Feb-2024 00:10
Aroclor 1016	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1221	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1232	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1242	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1248	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1254	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Aroclor 1260	U		0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
beta-BHC	0.000687	J	0.0000430	0.00125	UG/L	1	02-Feb-2024 00:10
Chlordane	U		0.0250	0.0250	UG/L	1	02-Feb-2024 00:10
delta-BHC	U		0.0000290	0.00125	UG/L	1	02-Feb-2024 00:10
Dieldrin	U		0.0000530	0.00250	UG/L	1	02-Feb-2024 00:10
Endosulfan I	U		0.0000390	0.00125	UG/L	1	02-Feb-2024 00:10
Endosulfan II	U		0.00250	0.00250	UG/L	1	02-Feb-2024 00:10
Endosulfan sulfate	U		0.0000930	0.00250	UG/L	1	02-Feb-2024 00:10
Endrin	U		0.0000830	0.00250	UG/L	1	02-Feb-2024 00:10
Endrin aldehyde	U		0.000147	0.00250	UG/L	1	02-Feb-2024 00:10
gamma-BHC	U		0.00125	0.00125	UG/L	1	02-Feb-2024 00:10
Heptachlor	0.000123	J	0.0000450	0.00125	UG/L	1	02-Feb-2024 00:10
Heptachlor epoxide	U		0.0000270	0.00125	UG/L	1	02-Feb-2024 00:10
Toxaphene	U		0.0250	0.0250	UG/L	1	02-Feb-2024 00:10
Total PCBs	U	n	0.0125	0.0125	UG/L	1	01-Feb-2024 16:51
Surr: Decachlorobiphenyl	107			61-154	%REC	1	01-Feb-2024 16:51
Surr: Decachlorobiphenyl	102			61-154	%REC	1	02-Feb-2024 00:10
Surr: Tetrachloro-m-xylene	80.0			60-144	%REC	1	02-Feb-2024 00:10
Surr: Tetrachloro-m-xylene	107			60-144	%REC	1	01-Feb-2024 16:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Sample ID: OF001 WK 2
Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT
WorkOrder:HS24011577
Lab ID:HS24011577-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 31-Jan-2024		Analyst: MSC	
Aluminum	43.6		0.800	10.0	ug/L	1	06-Feb-2024 16:42
Antimony	1.08	J	0.530	5.00	ug/L	1	05-Feb-2024 23:24
Arsenic	0.766	J	0.250	2.00	ug/L	1	05-Feb-2024 23:24
Barium	34.6		0.0840	4.00	ug/L	1	05-Feb-2024 23:24
Beryllium	U		0.0910	5.00	ug/L	1	05-Feb-2024 23:24
Boron	20.8		16.7	20.0	ug/L	1	05-Feb-2024 23:24
Cadmium	U		0.0770	2.00	ug/L	1	05-Feb-2024 23:24
Chromium	0.406	J	0.251	4.00	ug/L	1	05-Feb-2024 23:24
Cobalt	0.196	J	0.0400	5.00	ug/L	1	05-Feb-2024 23:24
Copper	2.25		0.170	2.00	ug/L	1	05-Feb-2024 23:24
Iron	573		50.0	200	ug/L	1	05-Feb-2024 23:24
Lead	0.349	J	0.120	2.00	ug/L	1	05-Feb-2024 23:24
Magnesium	5,990		7.80	500	ug/L	1	05-Feb-2024 23:24
Manganese	38.4		0.0660	5.00	ug/L	1	05-Feb-2024 23:24
Molybdenum	43.6		0.490	5.00	ug/L	1	05-Feb-2024 23:24
Nickel	1.02	J	0.110	2.00	ug/L	1	05-Feb-2024 23:24
Selenium	U		0.860	2.00	ug/L	1	05-Feb-2024 23:24
Silver	U		0.0440	2.00	ug/L	1	05-Feb-2024 23:24
Thallium	U		0.250	2.00	ug/L	1	05-Feb-2024 23:24
Tin	0.142	J	0.0580	5.00	ug/L	1	05-Feb-2024 23:24
Titanium	0.438	J	0.390	5.00	ug/L	1	05-Feb-2024 23:24
Zinc	25.3		1.00	4.00	ug/L	1	05-Feb-2024 23:24
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	2.33		0.610	2.00	mg/L	1	05-Feb-2024 10:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	1.87		0.0300	0.100	mg/L	1	30-Jan-2024 12:50
Chloride	59.4		0.200	0.500	mg/L	1	30-Jan-2024 12:50
Fluoride	1.62		0.0500	0.100	mg/L	1	30-Jan-2024 12:50
Nitrogen, Nitrate (As N)	4.99		0.0300	0.100	mg/L	1	30-Jan-2024 12:50
Sulfate	36.9		0.200	0.500	mg/L	1	30-Jan-2024 12:50
NITRATE/NITRITE BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Nitrate/Nitrite (as N)	7.81		0.300	2.00	mg/L	10	09-Feb-2024 07:48
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	97.0		5.00	15.0	mg/L	1	07-Feb-2024 10:30
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		Method:M2540C				Analyst: JAC	
Total Dissolved Solids (Residue, Filterable)	270		5.00	10.0	mg/L	1	05-Feb-2024 13:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK2
Sample ID: OF001 WK 2
Collection Date: 29-Jan-2024 06:46

ANALYTICAL REPORT

WorkOrder:HS24011577
Lab ID:HS24011577-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL SUSPENDED SOLIDS BY SM 2540D-2011 Method:M2540D							Analyst: JAC
Suspended Solids (Residue, Non-Filterable)	14.4		2.00	2.00	mg/L	1	02-Feb-2024 13:00
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011 Method:M4500 NH3 D							Prep:M4500-N C / 08-Feb-2024 Analyst: MZD
Nitrogen, Total Kjeldahl	56		0.10	0.50	mg/L	1	09-Feb-2024 15:00
CYANIDE BY SM 4500CN E&G-2011 Method:M4500CN EG							Prep:M4500CN E&G / 31-Jan-2024 Analyst: MZD
Cyanide	0.00300	J	0.00200	0.00500	mg/L	1	01-Feb-2024 12:12
DISSOLVED OXYGEN BY SM4500-O G Method:M4500-O G							Analyst: DW
Oxygen, Dissolved	6.01	H	1.00	1.00	mg/L	1	01-Feb-2024 14:45
COLOR BY SM 2120B - 2011 Method:SM2120B							Analyst: JAC
Color, Apparent	35.0		5.00	5.00	Color Units	1	30-Jan-2024 18:05
ALKALINITY BY -2011 Method:SM2320B							Analyst: DW
Alkalinity, Total (As CaCO3)	213		2.50	5.00	mg/L	1	08-Feb-2024 16:31
AMMONIA AS N BY SM4500 NH3-B-F-2011 Method:SM4500 NH3-B-F							Prep:M4500-NH3 B / 09-Feb-2024 Analyst: MZD
Nitrogen, Ammonia (as N)	38		3.1	6.2	mg/L	5	09-Feb-2024 17:00
SULFIDE BY SM4500 S2-F-2011 Method:SM4500 S2-F							Analyst: CD
Sulfide	U		1.70	2.00	mg/L	1	05-Feb-2024 16:20
RESIDUAL CHLORINE BY SM4500CL F-2011 Method:SM4500CL F							Analyst: MC
Chlorine	U	H	0.10	0.10	mg/L	1	02-Feb-2024 13:35
PH BY SM4500H+ B-2011 Method:SM4500H+ B							Analyst: DW
pH	7.94	H	0.100	0.100	pH Units	1	08-Feb-2024 16:31
Temp Deg C @pH	19.4	H	0	0	°C	1	08-Feb-2024 16:31
SULFITE BY SM4500SO3B Method:SM4500SO3B							Analyst: MC
Sulfite	U	H	5.00	5.00	mg/L	1	05-Feb-2024 16:36
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 29-Jan-2024 Analyst: JAC
Biochemical Oxygen Demand	U		2.00	2.00	mg/L	1	03-Feb-2024 12:43
CBOD BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 29-Jan-2024 Analyst: JAC
Carbonaceous Biochemical Oxygen Demand	U		2.00	2.00	mg/L	1	03-Feb-2024 12:45
TOTAL ORGANIC CARBON - SM5310B-2011 Method:SM5310B							Analyst: DW
Organic Carbon, Total	3.76		0.500	1.00	mg/L	1	08-Feb-2024 01:03
SURFACTANTS (MBAS) BY SM5540C Method:SM5540C							Prep:SM5540C / 30-Jan-2024 Analyst: MZD
MBAS	0.0610		0.00800	0.0500	mg/L 340 MW LAS	1	30-Jan-2024 16:29
SUBCONTRACT HEXAVALENT CHROMIUM Method:E218.6							Analyst: SUB
Chromium, Hexavalent	See Attached		0		UG/L	1	31-Jan-2024 15:03
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667 Method:NA							Analyst: SUBHO
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	OF001 WK 2	Lab ID:HS24011577-01
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - E. COLI		Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0			1	05-Feb-2024 11:52
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA				Analyst: SUBHO	
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	LL Hg Duplicate	Lab ID:HS24011577-02
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK2	WorkOrder:HS24011577
Sample ID:	LL Hg Field Blank	Lab ID:HS24011577-03
Collection Date:	29-Jan-2024 06:46	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	12-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.



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Chain of Custody Form

Page ____ of ____

COC ID: 312464

HS24011577

ChampionX LLC
2024 Permit Renewal



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	450443658	Project Name	2024 Permit Renewal
Work Order		Project Number	
Company Name	Nalco Company	Bill To Company	ChampionX LLC
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380
Address	PO Box 2167	Address	PO Box 2167
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542
Phone	(979) 239-5800	Phone	(979) 239-5800
Fax	(979) 233-6767	Fax	(979) 233-6767
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF001 WK2	1/29/24	0646	W	Neat	10	X										
2	OF001 WK2	1/29/24	0734	W	2	1		X									
3	OF001 WK2	1/29/24	0736	W	Neat	1			X								
4	OF001 WK2	1/29/24	0802	W	Neat	1				X							
5	OF001 WK2	1/29/24	0826	W							X						
6	OF001 WK2	1/29/24	0805	W								X					
7	OF001 WK2	1/29/24	0830	W	7	4							X				
8	OF001 WK2	1/29/24	0900	W		1								X			
9	OF001 WK2	1/29/24	0905	W		12									X		
10	OF001 WK2	1/29/24	0906	W												X	

Sampler(s) Please Print & Sign <i>Marcy Putnam</i>		Shipment Method P/U ALS		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hr		Results Due Date:	
Relinquished by: <i>Marcy Putnam</i>	Date: 1/29/24	Time: 0915	Received by: <i>D.S.</i>	Notes: Annual Permit Renewal			
Relinquished by: <i>D.S.</i>	Date: 1/29/24	Time: 1300	Received by (Laboratory): <i>D.S.</i>	Cooler ID 51882	Cooler Temp. Blue	QC Package: (Check One Box Below) <input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW48/CLP <input type="checkbox"/> Other	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):				
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035							

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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February 23, 2024

Andy Slater
ChampionX LLC
PO Box 2167
Freeport, TX 77542

Work Order: **HS24020181**

Laboratory Results for: **2024 Permit Renewal-WK3**

Dear Andy Slater,

ALS Environmental received 3 sample(s) on Feb 05, 2024 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER

Andy C. Neir

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Work Order: HS24020181

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24020181-01	OF001 WK 3	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>
HS24020181-02	LL Hg Duplicate	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>
HS24020181-03	LL Hg Field Blank	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Work Order: HS24020181

CASE NARRATIVE**Work Order Comments**

- The analyses for Enterococci and E.coli were subcontracted to Envirodyne Laboratories, Inc. in Houston, TX. Final report attached.
- The analysis for Formaldehyde was subcontracted to A&B Labs in Houston, TX. Final report attached.
- The analyses for Amines were subcontracted to SPL in Kilgore, TX. Final report attached.
- The analyses for Hexavalent Chromium were subcontracted to Pace Labs in Mount Juliet, TN. Final report attached.
- The analyses for low level mercury and available cyanide were subcontracted to ALS Environmental in Holland, MI. Final Report attached.
- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.
- Sample received outside method holding time for Sulfite, Residual Chlorine and Dissolved Oxygen. Sulfite, Residual Chlorine and Dissolved Oxygen are immediate tests. Sample results are flagged with an "H" qualifier.

ECD Organics by Method E608**Batch ID: 207206****Sample ID: LCS-207206**

- The multi-response compounds toxaphene and chlordane were not included in the spiking solution for the LCS.

Sample ID: MBLK-207206

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.

Sample ID: OF001 WK 3 (HS24020181-01)

- One or more surrogate recoveries were above the upper control limits. No target analytes were detected in the sample. The high surrogate recoveries did not impact the non-detect results for target analytes. DCB
- This sample was analyzed at a dilution in the 8081 Pesticide analysis due to sample matrix interference. Reporting limits were adjusted accordingly.

GCMS Semivolatiles by Method E625**Batch ID: 207145****Sample ID: LCSD-207145**

- The RPD between the LCS and LCSD was outside of the control limit.

GCMS Volatiles by Method E624**Batch ID: R458125****Sample ID: HS24020176-01MS**

- MS and MSD are for an unrelated sample

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Work Order: HS24020181

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R458126**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method E200.8**Batch ID: 206989****Sample ID: HS24020219-01MSD**

- MSD is for an unrelated sample

WetChemistry by Method E300**Batch ID: R458442****Sample ID: OF001 WK 3 (HS24020181-01)**

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrate/Nitrite (as N), Nitrogen, Nitrate (As N), Nitrogen, Nitrite (As N))

Batch ID: R458175

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540D**Batch ID: R458634**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500CL F**Batch ID: R458652**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4**Batch ID: R458816**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E1664A**Batch ID: R459062**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B**Batch ID: R459416**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Work Order: HS24020181

CASE NARRATIVE

WetChemistry by Method SM5310B**Batch ID: R459455**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500SO3B**Batch ID: R459065**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500H+ B**Batch ID: R459005**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540C**Batch ID: R458755**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500-O G**Batch ID: R458649**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 S2-F**Batch ID: R458541**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2120B**Batch ID: R458099**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500 NH3 D**Batch ID: 207525,R459324**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500CN EG**Batch ID: 207544**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Work Order: HS24020181

CASE NARRATIVE

WetChemistry by Method SM4500 NH3-B-F

Batch ID: 207527

Sample ID: HS24020320-03MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SM5540C

Batch ID: 207037

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5210 B

Batch ID: 206942,206943

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624			Analyst: TS	
1,1,1-Trichloroethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,1,2,2-Tetrachloroethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,1,2-Trichloroethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,1-Dichloroethane	U		0.000400	0.00500	mg/L	1	06-Feb-2024 16:12
1,1-Dichloroethene	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,2-Dibromoethane	U		0.000400	0.00500	mg/L	1	06-Feb-2024 16:12
1,2-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
1,2-Dichloroethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,2-Dichloropropane	U		0.000700	0.00500	mg/L	1	06-Feb-2024 16:12
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
1,4-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
2-Butanone	U		0.00100	0.0100	mg/L	1	06-Feb-2024 16:12
2-Chloroethyl vinyl ether	U		0.00130	0.0100	mg/L	1	06-Feb-2024 16:12
Acetonitrile	U	n	0.0250	0.0500	mg/L	1	06-Feb-2024 16:12
Acrolein	U		0.00400	0.0200	mg/L	1	06-Feb-2024 16:12
Acrylonitrile	U		0.00400	0.0100	mg/L	1	06-Feb-2024 16:12
Benzene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Benzyl Chloride	U	n	0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Bromodichloromethane	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Bromoform	0.00365	J	0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Bromomethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Carbon disulfide	U	n	0.000900	0.0100	mg/L	1	06-Feb-2024 16:12
Carbon tetrachloride	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Chlorobenzene	U		0.000400	0.00500	mg/L	1	06-Feb-2024 16:12
Chloroethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Chloroform	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Chloromethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
cis-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Dibromochloromethane	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Dibromomethane	U	n	0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Ethylbenzene	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Hexachlorobutadiene	U	n	0.00100	0.00500	mg/L	1	06-Feb-2024 16:12
Methylene chloride	U		0.00100	0.0100	mg/L	1	06-Feb-2024 16:12
Styrene	U	n	0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Tetrachloroethene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Toluene	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
trans-1,2-Dichloroethene	U		0.000400	0.00500	mg/L	1	06-Feb-2024 16:12
trans-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	06-Feb-2024 16:12
Trichloroethene	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Sample ID: OF001 WK 3
Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT
WorkOrder:HS24020181
Lab ID:HS24020181-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624			Analyst: TS	
Vinyl chloride	U		0.000400	0.00200	mg/L	1	06-Feb-2024 16:12
Xylenes, Total	U		0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Total Trihalomethanes (TTHMs)	0.00365	Ja	0.000500	0.00500	mg/L	1	06-Feb-2024 16:12
Surr: 1,2-Dichloroethane-d4	86.0			70-126	%REC	1	06-Feb-2024 16:12
Surr: 4-Bromofluorobenzene	96.0			82-124	%REC	1	06-Feb-2024 16:12
Surr: Dibromofluoromethane	85.6			77-123	%REC	1	06-Feb-2024 16:12
Surr: Toluene-d8	96.9			82-127	%REC	1	06-Feb-2024 16:12
VOLATILES - SW8260C			Method:SW8260			Analyst: TS	
Acetaldehyde	U	n	0.010	0.010	mg/L	1	06-Feb-2024 16:12
Propylene oxide	U	n	0.010	0.010	mg/L	1	06-Feb-2024 16:12
Surr: 1,2-Dichloroethane-d4	86.0			70-126	%REC	1	06-Feb-2024 16:12
Surr: 4-Bromofluorobenzene	96.0			82-124	%REC	1	06-Feb-2024 16:12
Surr: Dibromofluoromethane	85.6			77-123	%REC	1	06-Feb-2024 16:12
Surr: Toluene-d8	96.9			82-127	%REC	1	06-Feb-2024 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 09-Feb-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
1,2,4-Trichlorobenzene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
1,2-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
1,2-Diphenylhydrazine	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
1,4-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
2,4,5-Trichlorophenol	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
2,4,6-Trichlorophenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
2,4-Dichlorophenol	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
2,4-Dimethylphenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
2,4-Dinitrophenol	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
2,4-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
2,6-Dichlorophenol	U	n	0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
2,6-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
2-Chloronaphthalene	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
2-Chlorophenol	U		0.00100	0.00500	mg/L	1	09-Feb-2024 21:42
2-Methylphenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
2-Nitrophenol	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
3&4-Methylphenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
3,3'-Dichlorobenzidine	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
4,6-Dinitro-2-methylphenol	U		0.000900	0.00500	mg/L	1	09-Feb-2024 21:42
4-Bromophenyl phenyl ether	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
4-Chloro-3-methylphenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
4-Chlorophenyl phenyl ether	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
4-Nitrophenol	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
Acenaphthene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Acenaphthylene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Anthracene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Benz(a)anthracene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Benzidine	U		0.00500	0.00500	mg/L	1	09-Feb-2024 21:42
Benzo(a)pyrene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Benzo(b)fluoranthene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Benzo(g,h,i)perylene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Benzo(k)fluoranthene	U		0.000700	0.00500	mg/L	1	09-Feb-2024 21:42
Bis(2-chloroethoxy)methane	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Bis(2-chloroethyl)ether	U		0.000700	0.00500	mg/L	1	09-Feb-2024 21:42
Bis(2-chloroisopropyl)ether	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Bis(2-ethylhexyl)phthalate	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Butyl benzyl phthalate	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 09-Feb-2024		Analyst: GEY	
Chrysene	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Dibenz(a,h)anthracene	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
Diethyl phthalate	U		0.000700	0.00500	mg/L	1	09-Feb-2024 21:42
Dimethyl phthalate	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
Di-n-butyl phthalate	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Di-n-octyl phthalate	U		0.00200	0.00500	mg/L	1	09-Feb-2024 21:42
Fluoranthene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Fluorene	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
Hexachlorobenzene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Hexachlorobutadiene	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
Hexachlorocyclopentadiene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Hexachloroethane	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
Isophorone	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
Naphthalene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Nitrobenzene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
N-Nitrosodiethylamine	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
N-Nitrosodimethylamine	U		0.000600	0.00500	mg/L	1	09-Feb-2024 21:42
N-Nitroso-di-n-butylamine	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
N-Nitrosodi-n-propylamine	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
N-Nitrosodiphenylamine	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Nonylphenol	U	n	0.00500	0.00500	mg/L	1	09-Feb-2024 21:42
Pentachlorobenzene	U		0.000500	0.00500	mg/L	1	09-Feb-2024 21:42
Pentachlorophenol	U		0.000800	0.00500	mg/L	1	09-Feb-2024 21:42
Phenanthrene	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Phenol	U		0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Pyrene	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Pyridine	U		0.000300	0.00500	mg/L	1	09-Feb-2024 21:42
Cresols, Total	U	n	0.000400	0.00500	mg/L	1	09-Feb-2024 21:42
Surr: 2,4,6-Tribromophenol	73.7			42-124	%REC	1	09-Feb-2024 21:42
Surr: 2-Fluorobiphenyl	60.7			48-120	%REC	1	09-Feb-2024 21:42
Surr: 2-Fluorophenol	49.0			20-120	%REC	1	09-Feb-2024 21:42
Surr: 4-Terphenyl-d14	79.1			51-135	%REC	1	09-Feb-2024 21:42
Surr: Nitrobenzene-d5	62.0			41-120	%REC	1	09-Feb-2024 21:42
Surr: Phenol-d6	63.4			20-120	%REC	1	09-Feb-2024 21:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 12-Feb-2024		Analyst: DLB	
4,4'-DDD	U		0.000380	0.0125	UG/L	5	20-Feb-2024 21:47
4,4'-DDE	U		0.000500	0.0125	UG/L	5	20-Feb-2024 21:47
4,4'-DDT	U		0.000725	0.0125	UG/L	5	20-Feb-2024 21:47
Aldrin	U		0.000170	0.00625	UG/L	5	20-Feb-2024 21:47
alpha-BHC	U		0.00625	0.00625	UG/L	5	20-Feb-2024 21:47
Aroclor 1016	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1221	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1232	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1242	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1248	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1254	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Aroclor 1260	U		0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
beta-BHC	U		0.000215	0.00625	UG/L	5	20-Feb-2024 21:47
Chlordane	U		0.125	0.125	UG/L	5	20-Feb-2024 21:47
delta-BHC	0.0685		0.000145	0.00625	UG/L	5	20-Feb-2024 21:47
Dieldrin	U		0.000265	0.0125	UG/L	5	20-Feb-2024 21:47
Endosulfan I	U		0.000195	0.00625	UG/L	5	20-Feb-2024 21:47
Endosulfan II	U		0.0125	0.0125	UG/L	5	20-Feb-2024 21:47
Endosulfan sulfate	U		0.000465	0.0125	UG/L	5	20-Feb-2024 21:47
Endrin	U		0.000415	0.0125	UG/L	5	20-Feb-2024 21:47
Endrin aldehyde	U		0.000735	0.0125	UG/L	5	20-Feb-2024 21:47
gamma-BHC	U		0.00625	0.00625	UG/L	5	20-Feb-2024 21:47
Heptachlor	U		0.000225	0.00625	UG/L	5	20-Feb-2024 21:47
Heptachlor epoxide	U		0.000135	0.00625	UG/L	5	20-Feb-2024 21:47
Toxaphene	U		0.125	0.125	UG/L	5	20-Feb-2024 21:47
Total PCBs	U	n	0.0125	0.0125	UG/L	1	13-Feb-2024 15:54
Surr: Decachlorobiphenyl	99.8			61-154	%REC	1	13-Feb-2024 15:54
Surr: Decachlorobiphenyl	155	S		61-154	%REC	5	20-Feb-2024 21:47
Surr: Tetrachloro-m-xylene	83.5			60-144	%REC	1	13-Feb-2024 15:54
Surr: Tetrachloro-m-xylene	117			60-144	%REC	5	20-Feb-2024 21:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 06-Feb-2024		Analyst: JC	
Aluminum	0.249		0.000800	0.0100	mg/L	1	06-Feb-2024 23:37
Antimony	U		0.000530	0.00500	mg/L	1	06-Feb-2024 23:37
Arsenic	0.000861	J	0.000250	0.00200	mg/L	1	06-Feb-2024 23:37
Barium	0.0285		0.0000840	0.00400	mg/L	1	06-Feb-2024 23:37
Beryllium	U		0.0000910	0.00500	mg/L	1	06-Feb-2024 23:37
Boron	0.0514		0.0167	0.0200	mg/L	1	06-Feb-2024 23:37
Cadmium	U		0.0000770	0.00200	mg/L	1	06-Feb-2024 23:37
Chromium	0.000871	J	0.000251	0.00400	mg/L	1	06-Feb-2024 23:37
Cobalt	0.000266	J	0.0000400	0.00500	mg/L	1	06-Feb-2024 23:37
Copper	0.00443		0.000170	0.00200	mg/L	1	06-Feb-2024 23:37
Iron	0.311		0.0500	0.200	mg/L	1	06-Feb-2024 23:37
Lead	0.0268		0.000120	0.00200	mg/L	1	06-Feb-2024 23:37
Magnesium	3.82		0.00780	0.500	mg/L	1	06-Feb-2024 23:37
Manganese	0.0101		0.0000660	0.00500	mg/L	1	06-Feb-2024 23:37
Molybdenum	0.0144		0.000490	0.00500	mg/L	1	06-Feb-2024 23:37
Nickel	0.00201		0.000110	0.00200	mg/L	1	06-Feb-2024 23:37
Selenium	U		0.000860	0.00200	mg/L	1	06-Feb-2024 23:37
Silver	0.000101	J	0.0000440	0.00200	mg/L	1	06-Feb-2024 23:37
Thallium	U		0.000250	0.00200	mg/L	1	06-Feb-2024 23:37
Tin	0.000253	J	0.0000580	0.00500	mg/L	1	06-Feb-2024 23:37
Titanium	0.00541		0.000390	0.00500	mg/L	1	06-Feb-2024 23:37
Zinc	0.0411		0.00100	0.00400	mg/L	1	06-Feb-2024 23:37
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	U		0.610	2.00	mg/L	1	16-Feb-2024 08:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	0.855		0.0300	0.100	mg/L	1	06-Feb-2024 12:31
Chloride	29.9		0.200	0.500	mg/L	1	06-Feb-2024 12:31
Fluoride	0.0982	J	0.0500	0.100	mg/L	1	06-Feb-2024 12:31
Nitrogen, Nitrate (As N)	0.178		0.0300	0.100	mg/L	1	06-Feb-2024 12:31
Sulfate	15.6		0.200	0.500	mg/L	1	06-Feb-2024 12:31
NITRATE/NITRITE BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Nitrate/Nitrite (as N)	0.154	J	0.150	1.00	mg/L	5	09-Feb-2024 07:30
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	48.0		5.00	15.0	mg/L	1	14-Feb-2024 16:00
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		Method:M2540C				Analyst: JHD	
Total Dissolved Solids (Residue, Filterable)	124		5.00	10.0	mg/L	1	12-Feb-2024 11:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK3
 Sample ID: OF001 WK 3
 Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
 Lab ID:HS24020181-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL SUSPENDED SOLIDS BY SM 2540D-2011 Method:M2540D							Analyst: JHD
Suspended Solids (Residue, Non-Filterable)	6.91		2.00	2.00	mg/L	1	09-Feb-2024 13:19
ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011 Method:M4500 NH3 D							Analyst: MZD
Nitrogen, Organic	0.87		0.50	0.50	mg/L	1	20-Feb-2024 17:44
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011 Method:M4500 NH3 D							Prep:M4500-N C / 16-Feb-2024 Analyst: MZD
Nitrogen, Total Kjeldahl	1.0		0.10	0.50	mg/L	1	16-Feb-2024 15:46
CYANIDE BY SM 4500CN E&G-2011 Method:M4500CN EG							Prep:M4500CN E&G / 17-Feb-2024 Analyst: JAC
Cyanide	U		0.00200	0.00500	mg/L	1	17-Feb-2024 15:41
DISSOLVED OXYGEN BY SM4500-O G Method:M4500-O G							Analyst: JAC
Oxygen, Dissolved	9.58	H	1.00	1.00	mg/L	1	13-Feb-2024 13:30
COLOR BY SM 2120B - 2011 Method:SM2120B							Analyst: JAC
Color, Apparent	55.0		5.00	5.00	Color Units	1	05-Feb-2024 16:35
ALKALINITY BY -2011 Method:SM2320B							Analyst: JAC
Alkalinity, Total (As CaCO3)	54.1		2.50	5.00	mg/L	1	16-Feb-2024 13:08
AMMONIA AS N BY SM4500 NH3-B-F-2011 Method:SM4500 NH3-B-F							Prep:M4500-NH3 B / 16-Feb-2024 Analyst: MZD
Nitrogen, Ammonia (as N)	0.13		0.025	0.050	mg/L	1	16-Feb-2024 16:22
SULFIDE BY SM4500 S2-F-2011 Method:SM4500 S2-F							Analyst: CD
Sulfide	U		1.70	2.00	mg/L	1	10-Feb-2024 13:00
RESIDUAL CHLORINE BY SM4500CL F-2011 Method:SM4500CL F							Analyst: MC
Chlorine	0.20	*H	0.10	0.10	mg/L	1	13-Feb-2024 14:20
PH BY SM4500H+ B-2011 Method:SM4500H+ B							Analyst: MR
pH	7.62	H	0.100	0.100	pH Units	1	16-Feb-2024 08:02
Temp Deg C @pH	24.8	H	0	0	°C	1	16-Feb-2024 08:02
SULFITE BY SM4500SO3B Method:SM4500SO3B							Analyst: MC
Sulfite	U	H	5.00	5.00	mg/L	1	16-Feb-2024 13:40
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 05-Feb-2024 Analyst: JAC
Biochemical Oxygen Demand	U		2.00	2.00	mg/L	1	10-Feb-2024 12:00
CBOD BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 05-Feb-2024 Analyst: JAC
Carbonaceous Biochemical Oxygen Demand	2.90		2.00	2.00	mg/L	1	10-Feb-2024 12:00
TOTAL ORGANIC CARBON - SM5310B-2011 Method:SM5310B							Analyst: DW
Organic Carbon, Total	5.13		0.500	1.00	mg/L	1	21-Feb-2024 13:11
SURFACTANTS (MBAS) BY SM5540C Method:SM5540C							Prep:SM5540C / 06-Feb-2024 Analyst: MZD
MBAS	0.0800		0.00800	0.0500	mg/L 340 MW LAS	1	07-Feb-2024 08:49
SUBCONTRACT HEXAVALENT CHROMIUM Method:E218.6							Analyst: SUB
Chromium, Hexavalent	See Attached		0		UG/L	1	13-Feb-2024 20:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK3	WorkOrder:HS24020181
Sample ID:	OF001 WK 3	Lab ID:HS24020181-01
Collection Date:	05-Feb-2024 09:00	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - AMINES		Method:NA		Analyst: SPL			
Subcontract Analysis	See Attached		0		NA	1	21-Feb-2024 18:15
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	13-Feb-2024 11:28
SUBCONTRACT ANALYSIS - E. COLI		Method:NA		Analyst: EDL			
Subcontract Analysis	See Attached		0			1	15-Feb-2024 13:09
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA		Analyst: EDL			
Subcontract Analysis	See Attached		0			1	15-Feb-2024 13:09
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA		Analyst: SUB			
Subcontract Analysis	See Attached		0			1	09-Feb-2024 14:23
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	13-Feb-2024 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK3	WorkOrder:HS24020181
Sample ID:	LL Hg Duplicate	Lab ID:HS24020181-02
Collection Date:	05-Feb-2024 09:00	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	13-Feb-2024 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK3	WorkOrder:HS24020181
Sample ID:	LL Hg Field Blank	Lab ID:HS24020181-03
Collection Date:	05-Feb-2024 09:00	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	13-Feb-2024 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

Batch ID: 206942	Start Date: 05 Feb 2024 16:00	End Date: 05 Feb 2024 16:00
Method: WETCHEMPREP, BOD		Prep Code: BOD_PR 5210B

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206943	Start Date: 05 Feb 2024 16:00	End Date: 05 Feb 2024 16:00
Method: CBOD PREP		Prep Code: CBOD_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 206989	Start Date: 06 Feb 2024 12:30	End Date: 06 Feb 2024 12:30
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994		Prep Code: 200.8PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 207037	Start Date: 06 Feb 2024 16:00	End Date: 06 Feb 2024 16:00
Method: MBAS - PREPARATION		Prep Code: MBAS_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		400 (mL)	400 (mL)	1	1-L plastic, Neat

Batch ID: 207145	Start Date: 09 Feb 2024 08:08	End Date: 09 Feb 2024 08:08
Method: 625 AQ SEP FUNNEL EXTRACTION		Prep Code: 625PRF

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Sodium thiosulfate

Batch ID: 207206	Start Date: 12 Feb 2024 08:41	End Date: 12 Feb 2024 08:41
Method: AQPREP SEP FUNNEL: PEST/PCB		Prep Code: 608_W_LOWPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Neat

Batch ID: 207525	Start Date: 16 Feb 2024 13:55	End Date: 16 Feb 2024 13:55
Method: TKN WATER - PREP		Prep Code: TKN_W_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		25 (mL)	50 (mL)	2	1-liter amber glass, H2SO4 to pH <2

Batch ID: 207527	Start Date: 16 Feb 2024 12:00	End Date: 16 Feb 2024 12:00
Method: NITROGEN AMMONIA - WATER - PREP		Prep Code: NIT_AMM_W_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		25 (mL)	25 (mL)	1	1-liter amber glass, H2SO4 to pH <2

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

Batch ID: 207544	Start Date: 17 Feb 2024 09:30	End Date: 17 Feb 2024 09:30
Method: CYANIDE PREP - SM4500CN-2011	Prep Code: CN_TW4500_PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020181-01		50 (mL)	50 (mL)	1	250 mL plastic, NaOH/ASE

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 206942 (0)		Test Name : BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		05 Feb 2024 16:00	10 Feb 2024 12:00	1
Batch ID: 206943 (0)		Test Name : CBOD BY SM5210B-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		05 Feb 2024 16:00	10 Feb 2024 12:00	1
Batch ID: 206989 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		06 Feb 2024 12:30	06 Feb 2024 23:37	1
Batch ID: 207037 (0)		Test Name : SURFACTANTS (MBAS) BY SM5540C			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		06 Feb 2024 16:00	07 Feb 2024 08:49	1
Batch ID: 207145 (0)		Test Name : SEMIVOLATILE			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		09 Feb 2024 08:08	09 Feb 2024 21:42	1
Batch ID: 207206 (0)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		12 Feb 2024 08:41	20 Feb 2024 21:47	5
Batch ID: 207206 (1)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		12 Feb 2024 08:41	13 Feb 2024 15:54	1
Batch ID: 207525 (0)		Test Name : TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		16 Feb 2024 13:55	16 Feb 2024 15:46	1
Batch ID: 207527 (0)		Test Name : AMMONIA AS N BY SM4500 NH3-B-F-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		16 Feb 2024 12:00	16 Feb 2024 16:22	1
Batch ID: 207544 (0)		Test Name : CYANIDE BY SM 4500CN E&G-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00		17 Feb 2024 09:30	17 Feb 2024 15:41	1
Batch ID: R458099 (0)		Test Name : COLOR BY SM 2120B - 2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			05 Feb 2024 16:35	1
Batch ID: R458125 (0)		Test Name : VOLATILES			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			06 Feb 2024 16:12	1
Batch ID: R458126 (0)		Test Name : VOLATILES - SW8260C			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			06 Feb 2024 16:12	1
Batch ID: R458175 (0)		Test Name : ANIONS BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			06 Feb 2024 12:31	1
Batch ID: R458442 (0)		Test Name : NITRATE/NITRITE BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			09 Feb 2024 07:30	5
Batch ID: R458489 (0)		Test Name : SUBCONTRACT ANALYSIS - FORMALDEHYDE			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			09 Feb 2024 14:23	1
Batch ID: R458541 (0)		Test Name : SULFIDE BY SM4500 S2-F-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			10 Feb 2024 13:00	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R458577 (0)		Test Name : SUBCONTRACT HEXAVALENT CHROMIUM			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			13 Feb 2024 20:16	1
Batch ID: R458618 (0)		Test Name : SUBCONTRACT ANALYSIS - MERCURY LOW			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			13 Feb 2024 11:28	1
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			13 Feb 2024 11:28	1
HS24020181-02	LL Hg Duplicate	05 Feb 2024 09:00			13 Feb 2024 11:28	1
HS24020181-03	LL Hg Field Blank	05 Feb 2024 09:00			13 Feb 2024 11:28	1
Batch ID: R458634 (0)		Test Name : TOTAL SUSPENDED SOLIDS BY SM 2540D-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			09 Feb 2024 13:19	1
Batch ID: R458649 (0)		Test Name : DISSOLVED OXYGEN BY SM4500-O G			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			13 Feb 2024 13:30	1
Batch ID: R458652 (0)		Test Name : RESIDUAL CHLORINE BY SM4500CL F-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			13 Feb 2024 14:20	1
Batch ID: R458755 (0)		Test Name : TOTAL DISSOLVED SOLIDS BY SM2540C-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			12 Feb 2024 11:36	1
Batch ID: R458816 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			14 Feb 2024 16:00	1
Batch ID: R458910 (0)		Test Name : SUBCONTRACT ANALYSIS - ENTEROCOCCI			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			15 Feb 2024 13:09	1
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			15 Feb 2024 13:09	1
Batch ID: R459005 (0)		Test Name : PH BY SM4500H+ B-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			16 Feb 2024 08:02	1
Batch ID: R459062 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			16 Feb 2024 08:00	1
Batch ID: R459065 (0)		Test Name : SULFITE BY SM4500SO3B			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			16 Feb 2024 13:40	1
Batch ID: R459324 (0)		Test Name : ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			20 Feb 2024 17:44	1
Batch ID: R459416 (0)		Test Name : ALKALINITY BY -2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			16 Feb 2024 13:08	1
Batch ID: R459455 (0)		Test Name : TOTAL ORGANIC CARBON - SM5310B-2011			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			21 Feb 2024 13:11	1
Batch ID: R459463 (0)		Test Name : SUBCONTRACT ANALYSIS - AMINES			Matrix: Water	
HS24020181-01	OF001 WK 3	05 Feb 2024 09:00			21 Feb 2024 18:15	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207206 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608						
MBLK	Sample ID: MBLK-207206	Units: UG/L		Analysis Date: 20-Feb-2024 20:09						
Client ID:	Run ID: ECD_17_459358		SeqNo: 7843021		PrepDate: 12-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4'-DDD	U	0.00250								
4,4'-DDE	U	0.00250								
4,4'-DDT	U	0.00250								
Aldrin	U	0.00125								
alpha-BHC	U	0.00125								
beta-BHC	U	0.00125								
Chlordane	U	0.0250								
delta-BHC	U	0.00125								
Dieldrin	U	0.00250								
Endosulfan I	U	0.00125								
Endosulfan II	U	0.00250								
Endosulfan sulfate	U	0.00250								
Endrin	U	0.00250								
Endrin aldehyde	U	0.00250								
gamma-BHC	U	0.00125								
Heptachlor	U	0.00125								
Heptachlor epoxide	U	0.00125								
Toxaphene	U	0.0250								
Surr: Decachlorobiphenyl	0.02636	0	0.02	0	132	61 - 154				
Surr: Tetrachloro-m-xylene	0.02458	0	0.02	0	123	60 - 144				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207206 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608					
LCS		Sample ID: LCS-207206		Units: UG/L		Analysis Date: 20-Feb-2024 19:48			
Client ID:		Run ID: ECD_17_459358		SeqNo: 7843019		PrepDate: 12-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.05018	0.00250	0.05	0	100	53 - 144			
4,4'-DDE	0.05176	0.00250	0.05	0	104	55 - 144			
4,4'-DDT	0.04564	0.00250	0.05	0	91.3	53 - 149			
Aldrin	0.02319	0.00125	0.025	0	92.7	47 - 141			
alpha-BHC	0.0258	0.00125	0.025	0	103	51 - 141			
beta-BHC	0.02276	0.00125	0.025	0	91.0	58 - 144			
delta-BHC	0.02366	0.00125	0.025	0	94.6	48 - 146			
Dieldrin	0.04872	0.00250	0.05	0	97.4	56 - 144			
Endosulfan I	0.02174	0.00125	0.025	0	87.0	55 - 141			
Endosulfan II	0.04163	0.00250	0.05	0	83.3	57 - 144			
Endosulfan sulfate	0.04835	0.00250	0.05	0	96.7	58 - 145			
Endrin	0.04038	0.00250	0.05	0	80.8	60 - 163			
Endrin aldehyde	0.05116	0.00250	0.05	0	102	59 - 158			
gamma-BHC	0.02528	0.00125	0.025	0	101	53 - 142			
Heptachlor	0.0241	0.00125	0.025	0	96.4	51 - 144			
Heptachlor epoxide	0.02553	0.00125	0.025	0	102	55 - 142			
Surr: Decachlorobiphenyl	0.02122	0	0.02	0	106	61 - 154			
Surr: Tetrachloro-m-xylene	0.0203	0	0.02	0	102	60 - 144			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 207206 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608					
LCSD		Sample ID: LCSD-207206		Units: UG/L		Analysis Date: 20-Feb-2024 19:59			
Client ID:		Run ID: ECD_17_459358		SeqNo: 7843020		PrepDate: 12-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.05076	0.00250	0.05	0	102	53 - 144	0.05018	1.15	20
4,4'-DDE	0.05221	0.00250	0.05	0	104	55 - 144	0.05176	0.869	20
4,4'-DDT	0.04557	0.00250	0.05	0	91.1	53 - 149	0.04564	0.158	20
Aldrin	0.0233	0.00125	0.025	0	93.2	47 - 141	0.02319	0.465	20
alpha-BHC	0.02587	0.00125	0.025	0	103	51 - 141	0.0258	0.259	20
beta-BHC	0.02329	0.00125	0.025	0	93.2	58 - 144	0.02276	2.3	20
delta-BHC	0.02378	0.00125	0.025	0	95.1	48 - 146	0.02366	0.493	20
Dieldrin	0.04874	0.00250	0.05	0	97.5	56 - 144	0.04872	0.0246	20
Endosulfan I	0.02201	0.00125	0.025	0	88.0	55 - 141	0.02174	1.23	20
Endosulfan II	0.04258	0.00250	0.05	0	85.2	57 - 144	0.04163	2.25	20
Endosulfan sulfate	0.04862	0.00250	0.05	0	97.2	58 - 145	0.04835	0.567	20
Endrin	0.04027	0.00250	0.05	0	80.5	60 - 163	0.04038	0.265	20
Endrin aldehyde	0.05176	0.00250	0.05	0	104	59 - 158	0.05116	1.15	20
gamma-BHC	0.02535	0.00125	0.025	0	101	53 - 142	0.02528	0.304	20
Heptachlor	0.02388	0.00125	0.025	0	95.5	51 - 144	0.0241	0.909	20
Heptachlor epoxide	0.02556	0.00125	0.025	0	102	55 - 142	0.02553	0.137	20
Surr: Decachlorobiphenyl	0.02159	0	0.02	0	108	61 - 154	0.02122	1.75	20
Surr: Tetrachloro-m-xylene	0.02041	0	0.02	0	102	60 - 144	0.0203	0.526	20
The following samples were analyzed in this batch: HS24020181-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207206 (1)		Instrument: ECD_7		Method: CHLORINATED PEST/PCBS BY E608					
MBLK	Sample ID: MBLK-207206	Units: UG/L		Analysis Date: 13-Feb-2024 16:06					
Client ID:	Run ID: ECD_7_458736		SeqNo: 7829668		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	U	0.0200							
Aroclor 1221	U	0.0200							
Aroclor 1232	U	0.0200							
Aroclor 1242	U	0.0200							
Aroclor 1248	U	0.0200							
Aroclor 1254	U	0.0200							
Aroclor 1260	U	0.0200							
Surr: Decachlorobiphenyl	0.02184	0	0.02	0	109	61 - 154			
Surr: Tetrachloro-m-xylene	0.01788	0	0.02	0	89.4	60 - 144			

LCS	Sample ID: LCS1-207206	Units: UG/L		Analysis Date: 13-Feb-2024 16:19					
Client ID:	Run ID: ECD_7_458736		SeqNo: 7829669		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4456	0.0200	0.5	0	89.1	54 - 138			
Aroclor 1260	0.4863	0.0200	0.5	0	97.3	57 - 136			
Surr: Decachlorobiphenyl	0.0221	0	0.02	0	110	61 - 154			
Surr: Tetrachloro-m-xylene	0.01936	0	0.02	0	96.8	60 - 144			

LCSD	Sample ID: LCSD1-207206	Units: UG/L		Analysis Date: 13-Feb-2024 16:32					
Client ID:	Run ID: ECD_7_458736		SeqNo: 7829670		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4358	0.0200	0.5	0	87.2	54 - 138	0.4456	2.23	20
Aroclor 1260	0.4621	0.0200	0.5	0	92.4	57 - 136	0.4863	5.1	20
Surr: Decachlorobiphenyl	0.02084	0	0.02	0	104	61 - 154	0.0221	5.87	20
Surr: Tetrachloro-m-xylene	0.01818	0	0.02	0	90.9	60 - 144	0.01936	6.32	20

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 206989 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-206989	Units: ug/L		Analysis Date: 06-Feb-2024 23:10					
Client ID:	Run ID: ICPMS06_458106		SeqNo: 7817499		PrepDate: 06-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	7.606	10.0							J
Antimony	U	5.00							
Arsenic	U	2.00							
Barium	0.085	4.00							J
Beryllium	U	5.00							
Boron	U	20.0							
Cadmium	U	2.00							
Chromium	U	4.00							
Cobalt	U	5.00							
Copper	U	2.00							
Iron	U	200							
Lead	U	2.00							
Magnesium	17.16	500							J
Manganese	1.302	5.00							J
Molybdenum	U	5.00							
Nickel	U	2.00							
Selenium	U	2.00							
Silver	0.044	2.00							J
Thallium	U	2.00							
Tin	0.11	5.00							J
Titanium	U	5.00							
Zinc	1.725	4.00							J

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 206989 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
LCS		Sample ID: LCS-206989		Units: ug/L		Analysis Date: 06-Feb-2024 23:11			
Client ID:		Run ID: ICPMS06_458106		SeqNo: 7817500		PrepDate: 06-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	105	10.0	100	0	105	85 - 115			
Antimony	48.65	5.00	50	0	97.3	85 - 115			
Arsenic	47.67	2.00	50	0	95.3	85 - 115			
Barium	48.69	4.00	50	0	97.4	85 - 115			
Beryllium	47.24	5.00	50	0	94.5	85 - 115			
Boron	472.8	20.0	500	0	94.6	85 - 115			
Cadmium	48.53	2.00	50	0	97.1	85 - 115			
Chromium	47.37	4.00	50	0	94.7	85 - 115			
Cobalt	48.09	5.00	50	0	96.2	85 - 115			
Copper	49.44	2.00	50	0	98.9	85 - 115			
Iron	4811	200	5000	0	96.2	85 - 115			
Lead	48.26	2.00	50	0	96.5	85 - 115			
Magnesium	4990	500	5000	0	99.8	85 - 115			
Manganese	49.41	5.00	50	0	98.8	85 - 115			
Molybdenum	47.44	5.00	50	0	94.9	85 - 115			
Nickel	48.75	2.00	50	0	97.5	85 - 115			
Selenium	45.91	2.00	50	0	91.8	85 - 115			
Silver	49.76	2.00	50	0	99.5	85 - 115			
Tin	94.17	5.00	100	0	94.2	85 - 115			
Titanium	139.4	5.00	150	0	93.0	85 - 115			
Zinc	52.01	4.00	50	0	104	85 - 115			

LCS		Sample ID: LCS-206989		Units: ug/L		Analysis Date: 07-Feb-2024 13:30			
Client ID:		Run ID: ICPMS06_458235		SeqNo: 7818837		PrepDate: 06-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Thallium	42.9	2.00	50	0	85.8	85 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 206989 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS		Sample ID: HS24020219-01MS		Units: ug/L		Analysis Date: 06-Feb-2024 23:15			
Client ID:		Run ID: ICPMS06_458106		SeqNo: 7817502		PrepDate: 06-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	120	10.0	100	27.97	92.1	70 - 130			
Antimony	48.75	5.00	50	0.564	96.4	70 - 130			
Arsenic	48.46	2.00	50	0.643	95.6	70 - 130			
Barium	166.7	4.00	50	122.5	88.4	70 - 130			
Beryllium	51.26	5.00	50	0.042	102	70 - 130			
Boron	1886	20.0	500	1295	118	70 - 130			E
Cadmium	48.85	2.00	50	-0.015	97.7	70 - 130			
Chromium	46.52	4.00	50	1.377	90.3	70 - 130			
Cobalt	46.38	5.00	50	0.664	91.4	70 - 130			
Copper	48.87	2.00	50	3.061	91.6	70 - 130			
Iron	5993	200	5000	1418	91.5	70 - 130			
Lead	47.71	2.00	50	0.157	95.1	70 - 130			
Magnesium	34170	500	5000	30270	78.1	70 - 130			O
Manganese	368.6	5.00	50	321.6	94.1	70 - 130			O
Molybdenum	86.45	5.00	50	40.5	91.9	70 - 130			
Nickel	49.5	2.00	50	3.68	91.6	70 - 130			
Selenium	45.96	2.00	50	0.379	91.2	70 - 130			
Silver	45.93	2.00	50	0.041	91.8	70 - 130			
Thallium	42.19	2.00	50	0.463	83.4	70 - 130			
Tin	95.6	5.00	100	0.425	95.2	70 - 130			
Titanium	141	5.00	150	3.868	91.4	70 - 130			
Zinc	63.75	4.00	50	16.39	94.7	70 - 130			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 206989 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MSD	Sample ID: HS24020219-01MSD	Units: ug/L			Analysis Date: 06-Feb-2024 23:23				
Client ID:	Run ID: ICPMS06_458106		SeqNo: 7817505		PrepDate: 06-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	121.2	10.0	100	27.97	93.2	70 - 130	120	0.963	20
Antimony	47.14	5.00	50	0.564	93.2	70 - 130	48.75	3.35	20
Arsenic	47.2	2.00	50	0.643	93.1	70 - 130	48.46	2.62	20
Barium	168.8	4.00	50	122.5	92.6	70 - 130	166.7	1.25	20
Beryllium	49.24	5.00	50	0.042	98.4	70 - 130	51.26	4.02	20
Boron	1853	20.0	500	1295	112	70 - 130	1886	1.76	20 E
Cadmium	47.94	2.00	50	-0.015	95.9	70 - 130	48.85	1.88	20
Chromium	45.48	4.00	50	1.377	88.2	70 - 130	46.52	2.27	20
Cobalt	44.06	5.00	50	0.664	86.8	70 - 130	46.38	5.13	20
Copper	47.48	2.00	50	3.061	88.8	70 - 130	48.87	2.87	20
Iron	5839	200	5000	1418	88.4	70 - 130	5993	2.61	20
Lead	46.52	2.00	50	0.157	92.7	70 - 130	47.71	2.54	20
Magnesium	32810	500	5000	30270	50.9	70 - 130	34170	4.07	20 SO
Manganese	355.7	5.00	50	321.6	68.3	70 - 130	368.6	3.56	20 SO
Molybdenum	86.49	5.00	50	40.5	92.0	70 - 130	86.45	0.0428	20
Nickel	48.01	2.00	50	3.68	88.7	70 - 130	49.5	3.06	20
Selenium	46.86	2.00	50	0.379	93.0	70 - 130	45.96	1.93	20
Silver	46.02	2.00	50	0.041	91.9	70 - 130	45.93	0.176	20
Thallium	40.91	2.00	50	0.463	80.9	70 - 130	42.19	3.06	20
Tin	95.48	5.00	100	0.425	95.1	70 - 130	95.6	0.126	20
Titanium	136.5	5.00	150	3.868	88.4	70 - 130	141	3.22	20
Zinc	61.81	4.00	50	16.39	90.8	70 - 130	63.75	3.09	20

The following samples were analyzed in this batch:

HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207145	Units: ug/L		Analysis Date: 09-Feb-2024 13:24					
Client ID:	Run ID: SV-4_458601	SeqNo: 7827265		PrepDate: 09-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	U	5.00							
1,2,4-Trichlorobenzene	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Diphenylhydrazine	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2,4,5-Trichlorophenol	U	5.00							
2,4,6-Trichlorophenol	U	5.00							
2,4-Dichlorophenol	U	5.00							
2,4-Dimethylphenol	U	5.00							
2,4-Dinitrophenol	U	5.00							
2,4-Dinitrotoluene	U	5.00							
2,6-Dichlorophenol	U	5.00							
2,6-Dinitrotoluene	U	5.00							
2-Chloronaphthalene	U	5.00							
2-Chlorophenol	U	5.00							
2-Methylphenol	U	5.00							
2-Nitrophenol	U	5.00							
3&4-Methylphenol	U	5.00							
3,3'-Dichlorobenzidine	U	5.00							
4,6-Dinitro-2-methylphenol	U	5.00							
4-Bromophenyl phenyl ether	U	5.00							
4-Chloro-3-methylphenol	U	5.00							
4-Chlorophenyl phenyl ether	U	5.00							
4-Nitrophenol	U	5.00							
Acenaphthene	U	5.00							
Acenaphthylene	U	5.00							
Anthracene	U	5.00							
Benz(a)anthracene	U	5.00							
Benzidine	U	5.00							
Benzo(a)pyrene	U	5.00							
Benzo(b)fluoranthene	U	5.00							
Benzo(g,h,i)perylene	U	5.00							
Benzo(k)fluoranthene	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207145	Units: ug/L		Analysis Date: 09-Feb-2024 13:24					
Client ID:	Run ID: SV-4_458601	SeqNo: 7827265		PrepDate: 09-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	U	5.00							
Bis(2-chloroethyl)ether	U	5.00							
Bis(2-chloroisopropyl)ether	U	5.00							
Bis(2-ethylhexyl)phthalate	U	5.00							
Butyl benzyl phthalate	U	5.00							
Chrysene	U	5.00							
Dibenz(a,h)anthracene	U	5.00							
Diethyl phthalate	U	5.00							
Dimethyl phthalate	U	5.00							
Di-n-butyl phthalate	U	5.00							
Di-n-octyl phthalate	U	5.00							
Fluoranthene	U	5.00							
Fluorene	U	5.00							
Hexachlorobenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Hexachlorocyclopentadiene	U	5.00							
Hexachloroethane	U	5.00							
Indeno(1,2,3-cd)pyrene	U	5.00							
Isophorone	U	5.00							
Naphthalene	U	5.00							
Nitrobenzene	U	5.00							
N-Nitrosodiethylamine	U	5.00							
N-Nitrosodimethylamine	U	5.00							
N-Nitroso-di-n-butylamine	U	5.00							
N-Nitrosodi-n-propylamine	U	5.00							
N-Nitrosodiphenylamine	U	5.00							
Nonylphenol	U	5.00							
Pentachlorobenzene	U	5.00							
Pentachlorophenol	U	5.00							
Phenanthrene	U	5.00							
Phenol	U	5.00							
Pyrene	U	5.00							
Pyridine	U	5.00							
Cresols, Total	U	5.00							

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207145	Units: ug/L			Analysis Date: 09-Feb-2024 13:24				
Client ID:	Run ID: SV-4_458601		SeqNo: 7827265		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: 2,4,6-Tribromophenol	60.4	5.00	100	0	60.4	42 - 124			
Surr: 2-Fluorobiphenyl	64.83	5.00	100	0	64.8	48 - 120			
Surr: 2-Fluorophenol	66.72	5.00	100	0	66.7	20 - 120			
Surr: 4-Terphenyl-d14	69.52	5.00	100	0	69.5	51 - 135			
Surr: Nitrobenzene-d5	73.38	5.00	100	0	73.4	41 - 120			
Surr: Phenol-d6	74.9	5.00	100	0	74.9	20 - 120			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-207145		Units: ug/L		Analysis Date: 09-Feb-2024 13:45			
Client ID:		Run ID: SV-4_458601		SeqNo: 7827266		PrepDate: 09-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	74.58	5.00	100	0	74.6	49 - 120			
1,2,4-Trichlorobenzene	75.35	5.00	100	0	75.4	54 - 118			
1,2-Dichlorobenzene	73.91	5.00	100	0	73.9	49 - 115			
1,2-Diphenylhydrazine	89.42	5.00	100	0	89.4	57 - 134			
1,3-Dichlorobenzene	73.56	5.00	100	0	73.6	56 - 115			
1,4-Dichlorobenzene	73.04	5.00	100	0	73.0	56 - 115			
2,4,5-Trichlorophenol	77.73	5.00	100	0	77.7	52 - 115			
2,4,6-Trichlorophenol	78.41	5.00	100	0	78.4	56 - 115			
2,4-Dichlorophenol	80.13	5.00	100	0	80.1	53 - 115			
2,4-Dimethylphenol	84.9	5.00	100	0	84.9	53 - 115			
2,4-Dinitrophenol	83.97	5.00	100	0	84.0	47 - 115			
2,4-Dinitrotoluene	81.78	5.00	100	0	81.8	56 - 115			
2,6-Dichlorophenol	84.95	5.00	100	0	85.0	41 - 124			
2,6-Dinitrotoluene	82.74	5.00	100	0	82.7	57 - 115			
2-Chloronaphthalene	87.96	5.00	100	0	88.0	65 - 125			
2-Chlorophenol	77.71	5.00	100	0	77.7	54 - 115			
2-Methylphenol	80.8	5.00	100	0	80.8	53 - 115			
2-Nitrophenol	78.17	5.00	100	0	78.2	53 - 115			
3&4-Methylphenol	102.9	5.00	100	0	103	48 - 115			
3,3'-Dichlorobenzidine	76.45	5.00	100	0	76.5	25 - 115			
4,6-Dinitro-2-methylphenol	81.6	5.00	100	0	81.6	51 - 121			
4-Bromophenyl phenyl ether	78.12	5.00	100	0	78.1	49 - 115			
4-Chloro-3-methylphenol	87.38	5.00	100	0	87.4	51 - 115			
4-Chlorophenyl phenyl ether	79.84	5.00	100	0	79.8	56 - 115			
4-Nitrophenol	75.78	5.00	100	0	75.8	26 - 133			
Acenaphthene	78.91	5.00	100	0	78.9	57 - 115			
Acenaphthylene	78.59	5.00	100	0	78.6	57 - 118			
Anthracene	80.1	5.00	100	0	80.1	65 - 115			
Benz(a)anthracene	80.54	5.00	100	0	80.5	53 - 115			
Benzidine	13.59	5.00	100	0	13.6	10 - 115			
Benzo(a)pyrene	80.85	5.00	100	0	80.9	57 - 115			
Benzo(b)fluoranthene	99.92	5.00	100	0	99.9	54 - 117			
Benzo(g,h,i)perylene	81.93	5.00	100	0	81.9	56 - 115			
Benzo(k)fluoranthene	79.22	5.00	100	0	79.2	50 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-207145		Units: ug/L		Analysis Date: 09-Feb-2024 13:45			
Client ID:		Run ID: SV-4_458601		SeqNo: 7827266		PrepDate: 09-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	97.64	5.00	100	0	97.6	54 - 115			
Bis(2-chloroethyl)ether	81.17	5.00	100	0	81.2	56 - 115			
Bis(2-chloroisopropyl)ether	85.68	5.00	100	0	85.7	48 - 115			
Bis(2-ethylhexyl)phthalate	82.89	5.00	100	0	82.9	50 - 115			
Butyl benzyl phthalate	82.75	5.00	100	0	82.7	51 - 115			
Chrysene	76.71	5.00	100	0	76.7	52 - 120			
Dibenz(a,h)anthracene	82.62	5.00	100	0	82.6	56 - 115			
Diethyl phthalate	84.17	5.00	100	0	84.2	57 - 115			
Dimethyl phthalate	81.89	5.00	100	0	81.9	56 - 115			
Di-n-butyl phthalate	84.85	5.00	100	0	84.8	54 - 115			
Di-n-octyl phthalate	86.65	5.00	100	0	86.6	49 - 115			
Fluoranthene	83.01	5.00	100	0	83.0	58 - 115			
Fluorene	81.67	5.00	100	0	81.7	56 - 115			
Hexachlorobenzene	78.02	5.00	100	0	78.0	54 - 115			
Hexachlorobutadiene	74.36	5.00	100	0	74.4	51 - 115			
Hexachlorocyclopentadiene	75.32	5.00	100	0	75.3	48 - 115			
Hexachloroethane	76.63	5.00	100	0	76.6	54 - 115			
Indeno(1,2,3-cd)pyrene	81.8	5.00	100	0	81.8	51 - 115			
Isophorone	85.13	5.00	100	0	85.1	55 - 115			
Naphthalene	78.35	5.00	100	0	78.4	55 - 115			
Nitrobenzene	81.52	5.00	100	0	81.5	40 - 124			
N-Nitrosodiethylamine	32.9	5.00	50	0	65.8	40 - 130			
N-Nitrosodimethylamine	79.11	5.00	100	0	79.1	42 - 115			
N-Nitroso-di-n-butylamine	37.06	5.00	50	0	74.1	40 - 130			
N-Nitrosodi-n-propylamine	84.78	5.00	100	0	84.8	55 - 119			
N-Nitrosodiphenylamine	79.7	5.00	100	0	79.7	52 - 115			
Pentachlorobenzene	78.63	5.00	100	0	78.6	50 - 117			
Pentachlorophenol	80.9	5.00	100	0	80.9	45 - 125			
Phenanthrene	80.72	5.00	100	0	80.7	57 - 115			
Phenol	78.01	5.00	100	0	78.0	38 - 115			
Pyrene	78.94	5.00	100	0	78.9	54 - 119			
Pyridine	63.5	5.00	100	0	63.5	34 - 115			
Cresols, Total	183.7	5.00	200	0	91.9	48 - 115			
Surr: 2,4,6-Tribromophenol	69.81	5.00	100	0	69.8	42 - 124			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS	Sample ID: LCS-207145	Units: ug/L		Analysis Date: 09-Feb-2024 13:45					
Client ID:	Run ID: SV-4_458601		SeqNo: 7827266		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: 2-Fluorobiphenyl	71.47	5.00	100	0	71.5	48 - 120			
Surr: 2-Fluorophenol	67.37	5.00	100	0	67.4	20 - 120			
Surr: 4-Terphenyl-d14	71.48	5.00	100	0	71.5	51 - 135			
Surr: Nitrobenzene-d5	73.68	5.00	100	0	73.7	41 - 120			
Surr: Phenol-d6	71.98	5.00	100	0	72.0	20 - 120			

LCS	Sample ID: LCS1-207145	Units: ug/L		Analysis Date: 09-Feb-2024 14:27					
Client ID:	Run ID: SV-4_458601		SeqNo: 7827268		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Nonylphenol	30.85	5.00	50	0	61.7	40 - 140			
Surr: 2,4,6-Tribromophenol	65.23	5.00	100	0	65.2	42 - 124			
Surr: 2-Fluorobiphenyl	67.75	5.00	100	0	67.8	48 - 120			
Surr: 2-Fluorophenol	58.04	5.00	100	0	58.0	20 - 120			
Surr: 4-Terphenyl-d14	73.69	5.00	100	0	73.7	51 - 135			
Surr: Nitrobenzene-d5	69.78	5.00	100	0	69.8	41 - 120			
Surr: Phenol-d6	66.34	5.00	100	0	66.3	20 - 120			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-207145		Units: ug/L		Analysis Date: 09-Feb-2024 14:06				
Client ID:		Run ID: SV-4_458601		SeqNo: 7827267		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4,5-Tetrachlorobenzene	74.5	5.00	100	0	74.5	49 - 120	74.58	0.109	20	
1,2,4-Trichlorobenzene	75.86	5.00	100	0	75.9	54 - 118	75.35	0.664	20	
1,2-Dichlorobenzene	75.66	5.00	100	0	75.7	49 - 115	73.91	2.34	20	
1,2-Diphenylhydrazine	93	5.00	100	0	93.0	57 - 134	89.42	3.93	20	
1,3-Dichlorobenzene	75.13	5.00	100	0	75.1	56 - 115	73.56	2.11	20	
1,4-Dichlorobenzene	74.44	5.00	100	0	74.4	56 - 115	73.04	1.9	20	
2,4,5-Trichlorophenol	78.7	5.00	100	0	78.7	52 - 115	77.73	1.25	20	
2,4,6-Trichlorophenol	78.41	5.00	100	0	78.4	56 - 115	78.41	0.00521	20	
2,4-Dichlorophenol	79.3	5.00	100	0	79.3	53 - 115	80.13	1.04	20	
2,4-Dimethylphenol	84.84	5.00	100	0	84.8	53 - 115	84.9	0.0758	20	
2,4-Dinitrophenol	80.24	5.00	100	0	80.2	47 - 115	83.97	4.54	20	
2,4-Dinitrotoluene	78.27	5.00	100	0	78.3	56 - 115	81.78	4.38	20	
2,6-Dichlorophenol	84.83	5.00	100	0	84.8	41 - 124	84.95	0.147	20	
2,6-Dinitrotoluene	82.79	5.00	100	0	82.8	57 - 115	82.74	0.0602	20	
2-Chloronaphthalene	109.4	5.00	100	0	109	65 - 125	87.96	21.7	20	R
2-Chlorophenol	79.12	5.00	100	0	79.1	54 - 115	77.71	1.81	20	
2-Methylphenol	81.75	5.00	100	0	81.8	53 - 115	80.8	1.18	20	
2-Nitrophenol	77.36	5.00	100	0	77.4	53 - 115	78.17	1.04	20	
3&4-Methylphenol	104.9	5.00	100	0	105	48 - 115	102.9	1.91	20	
3,3'-Dichlorobenzidine	77.7	5.00	100	0	77.7	25 - 115	76.45	1.62	20	
4,6-Dinitro-2-methylphenol	78.46	5.00	100	0	78.5	51 - 121	81.6	3.92	20	
4-Bromophenyl phenyl ether	80.74	5.00	100	0	80.7	49 - 115	78.12	3.29	20	
4-Chloro-3-methylphenol	87.14	5.00	100	0	87.1	51 - 115	87.38	0.285	20	
4-Chlorophenyl phenyl ether	80.08	5.00	100	0	80.1	56 - 115	79.84	0.301	20	
4-Nitrophenol	66.02	5.00	100	0	66.0	26 - 133	75.78	13.8	20	
Acenaphthene	79.39	5.00	100	0	79.4	57 - 115	78.91	0.598	20	
Acenaphthylene	77.51	5.00	100	0	77.5	57 - 118	78.59	1.38	20	
Anthracene	80.38	5.00	100	0	80.4	65 - 115	80.1	0.355	20	
Benz(a)anthracene	84.15	5.00	100	0	84.2	53 - 115	80.54	4.38	20	
Benzidine	12.48	5.00	100	0	12.5	10 - 115	13.59	8.47	20	
Benzo(a)pyrene	80.7	5.00	100	0	80.7	57 - 115	80.85	0.188	20	
Benzo(b)fluoranthene	88.61	5.00	100	0	88.6	54 - 117	99.92	12	20	
Benzo(g,h,i)perylene	81.02	5.00	100	0	81.0	56 - 115	81.93	1.12	20	
Benzo(k)fluoranthene	71.46	5.00	100	0	71.5	50 - 115	79.22	10.3	20	

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-207145		Units: ug/L		Analysis Date: 09-Feb-2024 14:06				
Client ID:		Run ID: SV-4_458601		SeqNo: 7827267		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	98.35	5.00	100	0	98.4	54 - 115	97.64	0.724	20	
Bis(2-chloroethyl)ether	89.52	5.00	100	0	89.5	56 - 115	81.17	9.78	20	
Bis(2-chloroisopropyl)ether	90.48	5.00	100	0	90.5	48 - 115	85.68	5.45	20	
Bis(2-ethylhexyl)phthalate	87.81	5.00	100	0	87.8	50 - 115	82.89	5.76	20	
Butyl benzyl phthalate	85.9	5.00	100	0	85.9	51 - 115	82.75	3.74	20	
Chrysene	79.26	5.00	100	0	79.3	52 - 120	76.71	3.28	20	
Dibenz(a,h)anthracene	82.67	5.00	100	0	82.7	56 - 115	82.62	0.0535	20	
Diethyl phthalate	82.18	5.00	100	0	82.2	57 - 115	84.17	2.39	20	
Dimethyl phthalate	81.44	5.00	100	0	81.4	56 - 115	81.89	0.554	20	
Di-n-butyl phthalate	83.84	5.00	100	0	83.8	54 - 115	84.85	1.19	20	
Di-n-octyl phthalate	88.92	5.00	100	0	88.9	49 - 115	86.65	2.59	20	
Fluoranthene	79.85	5.00	100	0	79.9	58 - 115	83.01	3.87	20	
Fluorene	80.93	5.00	100	0	80.9	56 - 115	81.67	0.91	20	
Hexachlorobenzene	79.75	5.00	100	0	79.7	54 - 115	78.02	2.19	20	
Hexachlorobutadiene	73.75	5.00	100	0	73.7	51 - 115	74.36	0.824	20	
Hexachlorocyclopentadiene	75.38	5.00	100	0	75.4	48 - 115	75.32	0.0696	20	
Hexachloroethane	78.77	5.00	100	0	78.8	54 - 115	76.63	2.75	20	
Indeno(1,2,3-cd)pyrene	81.9	5.00	100	0	81.9	51 - 115	81.8	0.116	20	
Isophorone	86.44	5.00	100	0	86.4	55 - 115	85.13	1.52	20	
Naphthalene	78.52	5.00	100	0	78.5	55 - 115	78.35	0.209	20	
Nitrobenzene	82.52	5.00	100	0	82.5	40 - 124	81.52	1.22	20	
N-Nitrosodiethylamine	33.93	5.00	50	0	67.9	40 - 130	32.9	3.08	20	
N-Nitrosodimethylamine	80.37	5.00	100	0	80.4	42 - 115	79.11	1.58	20	
N-Nitroso-di-n-butylamine	37.45	5.00	50	0	74.9	40 - 130	37.06	1.04	20	
N-Nitrosodi-n-propylamine	87.19	5.00	100	0	87.2	55 - 119	84.78	2.81	20	
N-Nitrosodiphenylamine	80.56	5.00	100	0	80.6	52 - 115	79.7	1.08	20	
Pentachlorobenzene	78.47	5.00	100	0	78.5	50 - 117	78.63	0.201	20	
Pentachlorophenol	79.75	5.00	100	0	79.7	45 - 125	80.9	1.44	20	
Phenanthrene	79.78	5.00	100	0	79.8	57 - 115	80.72	1.18	20	
Phenol	86.91	5.00	100	0	86.9	38 - 115	78.01	10.8	20	
Pyrene	80.79	5.00	100	0	80.8	54 - 119	78.94	2.31	20	
Pyridine	63.04	5.00	100	0	63.0	34 - 115	63.5	0.714	20	
Cresols, Total	186.7	5.00	200	0	93.3	48 - 115	183.7	1.59	20	
Surr: 2,4,6-Tribromophenol	67.15	5.00	100	0	67.1	42 - 124	69.81	3.89	20	

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207145 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-207145		Units: ug/L		Analysis Date: 09-Feb-2024 14:06				
Client ID:		Run ID: SV-4_458601		SeqNo: 7827267		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorobiphenyl	72.66	5.00	100	0	72.7	48 - 120	71.47	1.65	20	
Surr: 2-Fluorophenol	68.89	5.00	100	0	68.9	20 - 120	67.37	2.24	20	
Surr: 4-Terphenyl-d14	72.23	5.00	100	0	72.2	51 - 135	71.48	1.04	20	
Surr: Nitrobenzene-d5	73.89	5.00	100	0	73.9	41 - 120	73.68	0.292	20	
Surr: Phenol-d6	74.6	5.00	100	0	74.6	20 - 120	71.98	3.57	20	

LCSD		Sample ID: LCSD1-207145		Units: ug/L		Analysis Date: 09-Feb-2024 15:23				
Client ID:		Run ID: SV-4_458601		SeqNo: 7827269		PrepDate: 09-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	29.66	5.00	50	0	59.3	40 - 140	30.85	3.93	20	
Surr: 2,4,6-Tribromophenol	65.06	5.00	100	0	65.1	42 - 124	65.23	0.274	20	
Surr: 2-Fluorobiphenyl	69.55	5.00	100	0	69.5	48 - 120	67.75	2.61	20	
Surr: 2-Fluorophenol	57.83	5.00	100	0	57.8	20 - 120	58.04	0.362	20	
Surr: 4-Terphenyl-d14	73.77	5.00	100	0	73.8	51 - 135	73.69	0.0981	20	
Surr: Nitrobenzene-d5	68.74	5.00	100	0	68.7	41 - 120	69.78	1.5	20	
Surr: Phenol-d6	66.85	5.00	100	0	66.9	20 - 120	66.34	0.771	20	

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240206	Units: ug/L		Analysis Date: 06-Feb-2024 10:56					
Client ID:	Run ID: VOA9_458125	SeqNo: 7816259		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	U	5.00							
1,1,2,2-Tetrachloroethane	U	5.00							
1,1,2-Trichloroethane	U	5.00							
1,1-Dichloroethane	U	5.00							
1,1-Dichloroethene	U	5.00							
1,2-Dibromoethane	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Dichloroethane	U	5.00							
1,2-Dichloropropane	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2-Butanone	U	10.0							
2-Chloroethyl vinyl ether	U	10.0							
Acetonitrile	U	50.0							
Acrolein	U	20.0							
Acrylonitrile	U	10.0							
Benzene	U	5.00							
Benzyl Chloride	U	5.00							
Bromodichloromethane	U	5.00							
Bromoform	U	5.00							
Bromomethane	U	5.00							
Carbon disulfide	U	10.0							
Carbon tetrachloride	U	5.00							
Chlorobenzene	U	5.00							
Chloroethane	U	5.00							
Chloroform	U	5.00							
Chloromethane	U	5.00							
cis-1,3-Dichloropropene	U	5.00							
Dibromochloromethane	U	5.00							
Dibromomethane	U	5.00							
Ethylbenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Methylene chloride	U	10.0							
Styrene	U	5.00							

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240206	Units: ug/L		Analysis Date: 06-Feb-2024 10:56					
Client ID:	Run ID: VOA9_458125		SeqNo: 7816259		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	U	5.00							
Toluene	U	5.00							
trans-1,2-Dichloroethene	U	5.00							
trans-1,3-Dichloropropene	U	5.00							
Trichloroethene	U	5.00							
Vinyl chloride	U	2.00							
Xylenes, Total	U	5.00							
Total Trihalomethanes (TTHMs)	U	5.00							
Surr: 1,2-Dichloroethane-d4	42.77	5.00	50	0	85.5	70 - 126			
Surr: 4-Bromofluorobenzene	47.77	5.00	50	0	95.5	82 - 124			
Surr: Dibromofluoromethane	41.83	5.00	50	0	83.7	77 - 123			
Surr: Toluene-d8	48.77	5.00	50	0	97.5	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
LCS		Sample ID: VLCSW-240206		Units: ug/L		Analysis Date: 06-Feb-2024 10:10			
Client ID:		Run ID: VOA9_458125		SeqNo: 7816258		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	21	5.00	20	0	105	70 - 130			
1,1,2,2-Tetrachloroethane	22.64	5.00	20	0	113	70 - 120			
1,1,2-Trichloroethane	22.51	5.00	20	0	113	77 - 113			
1,1-Dichloroethane	20.61	5.00	20	0	103	71 - 122			
1,1-Dichloroethene	19.81	5.00	20	0	99.0	70 - 130			
1,2-Dibromoethane	22.56	5.00	20	0	113	76 - 123			
1,2-Dichlorobenzene	20.86	5.00	20	0	104	77 - 113			
1,2-Dichloroethane	22.41	5.00	20	0	112	70 - 124			
1,2-Dichloropropane	21.6	5.00	20	0	108	72 - 119			
1,3-Dichlorobenzene	20.93	5.00	20	0	105	78 - 118			
1,4-Dichlorobenzene	21.21	5.00	20	0	106	79 - 113			
2-Butanone	45.47	10.0	40	0	114	70 - 130			
2-Chloroethyl vinyl ether	51.25	10.0	40	0	128	60 - 135			
Acetonitrile	209.8	50.0	200	0	105	70 - 130			
Acrolein	48.52	20.0	40	0	121	70 - 130			
Acrylonitrile	44.21	10.0	40	0	111	70 - 130			
Benzene	21.43	5.00	20	0	107	74 - 120			
Benzyl Chloride	19.32	5.00	20	0	96.6	70 - 130			
Bromodichloromethane	21.72	5.00	20	0	109	74 - 122			
Bromoform	20.56	5.00	20	0	103	73 - 128			
Bromomethane	22.37	5.00	20	0	112	70 - 130			
Carbon disulfide	38.11	10.0	40	0	95.3	70 - 130			
Carbon tetrachloride	20.97	5.00	20	0	105	71 - 125			
Chlorobenzene	21.06	5.00	20	0	105	76 - 113			
Chloroethane	19.84	5.00	20	0	99.2	70 - 130			
Chloroform	20.52	5.00	20	0	103	71 - 121			
Chloromethane	20.13	5.00	20	0	101	70 - 129			
cis-1,3-Dichloropropene	20.18	5.00	20	0	101	73 - 127			
Dibromochloromethane	21.38	5.00	20	0	107	77 - 122			
Dibromomethane	22.66	5.00	20	0	113	78 - 121			
Ethylbenzene	20.6	5.00	20	0	103	77 - 117			
Hexachlorobutadiene	20.96	5.00	20	0	105	70 - 130			
Methylene chloride	20.54	10.0	20	0	103	70 - 127			
Styrene	20.99	5.00	20	0	105	72 - 126			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
LCS		Sample ID: VLCSW-240206		Units: ug/L		Analysis Date: 06-Feb-2024 10:10			
Client ID:		Run ID: VOA9_458125		SeqNo: 7816258		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	21.33	5.00	20	0	107	76 - 119			
Toluene	20.72	5.00	20	0	104	77 - 118			
trans-1,2-Dichloroethene	19.45	5.00	20	0	97.3	72 - 127			
trans-1,3-Dichloropropene	20.91	5.00	20	0	105	77 - 119			
Trichloroethene	20.94	5.00	20	0	105	79 - 120			
Vinyl chloride	19.09	2.00	20	0	95.4	70 - 130			
Xylenes, Total	63.12	5.00	60	0	105	75 - 122			
Total Trihalomethanes (TTHMs)	84.18	5.00	80	0	105	65 - 135			
Surr: 1,2-Dichloroethane-d4	53.51	5.00	50	0	107	70 - 130			
Surr: 4-Bromofluorobenzene	51.46	5.00	50	0	103	83 - 122			
Surr: Dibromofluoromethane	51.42	5.00	50	0	103	73 - 126			
Surr: Toluene-d8	50.66	5.00	50	0	101	81 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MS		Sample ID: HS24020176-01MS		Units: ug/L		Analysis Date: 06-Feb-2024 12:04			
Client ID:		Run ID: VOA9_458125		SeqNo: 7816261		PrepDate:		DF: 10000	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	196700	50000	200000	0	98.4	70 - 130			
1,1,2,2-Tetrachloroethane	213900	50000	200000	0	107	70 - 123			
1,1,2-Trichloroethane	205200	50000	200000	0	103	70 - 117			
1,1-Dichloroethane	186200	50000	200000	0	93.1	70 - 127			
1,1-Dichloroethene	189200	50000	200000	0	94.6	70 - 130			
1,2-Dibromoethane	202100	50000	200000	0	101	70 - 124			
1,2-Dichlorobenzene	196000	50000	200000	15770	90.1	70 - 115			
1,2-Dichloroethane	202900	50000	200000	13740	94.6	70 - 127			
1,2-Dichloropropane	198900	50000	200000	292300	-46.7	70 - 122			S
1,3-Dichlorobenzene	193200	50000	200000	20900	86.2	70 - 119			
1,4-Dichlorobenzene	193900	50000	200000	16180	88.9	70 - 114			
2-Butanone	405700	100000	400000	0	101	70 - 130			
2-Chloroethyl vinyl ether	360900	100000	400000	0	90.2	65 - 135			
Acetonitrile	1776000	500000	2e+006	115200	83.1	70 - 130			
Acrolein	441400	200000	400000	0	110	70 - 130			
Acrylonitrile	654300	100000	400000	266300	97.0	70 - 130			
Benzene	194000	50000	200000	16210	88.9	70 - 127			
Benzyl Chloride	162900	50000	200000	0	81.5	70 - 130			
Bromodichloromethane	198100	50000	200000	0	99.0	70 - 124			
Bromoform	192500	50000	200000	0	96.3	70 - 129			
Bromomethane	204100	50000	200000	2086	101	70 - 130			
Carbon disulfide	353000	100000	400000	0	88.2	70 - 130			
Carbon tetrachloride	202900	50000	200000	95300	53.8	70 - 130			S
Chlorobenzene	199600	50000	200000	0	99.8	70 - 114			
Chloroethane	180800	50000	200000	19450	80.7	70 - 130			
Chloroform	192000	50000	200000	0	96.0	70 - 125			
Chloromethane	195800	50000	200000	7565	94.1	70 - 130			
cis-1,3-Dichloropropene	181200	50000	200000	0	90.6	70 - 125			
Dibromochloromethane	194800	50000	200000	0	97.4	70 - 124			
Dibromomethane	198100	50000	200000	0	99.0	70 - 124			
Ethylbenzene	194600	50000	200000	0	97.3	70 - 124			
Hexachlorobutadiene	192300	50000	200000	0	96.2	70 - 130			
Methylene chloride	189400	100000	200000	15160	87.1	70 - 128			
Styrene	186700	50000	200000	17730	84.5	70 - 130			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MS		Sample ID: HS24020176-01MS		Units: ug/L		Analysis Date: 06-Feb-2024 12:04			
Client ID:		Run ID: VOA9_458125		SeqNo: 7816261		PrepDate:		DF: 10000	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Tetrachloroethene	205200	50000	200000	0	103	70 - 130			
Toluene	196200	50000	200000	0	98.1	70 - 123			
trans-1,2-Dichloroethene	181000	50000	200000	0	90.5	70 - 130			
trans-1,3-Dichloropropene	185400	50000	200000	0	92.7	70 - 121			
Trichloroethene	201400	50000	200000	0	101	70 - 129			
Vinyl chloride	176800	20000	200000	17160	79.8	70 - 130			
Xylenes, Total	584400	50000	600000	0	97.4	70 - 130			
Total Trihalomethanes (TTHMs)	777400	50000	800000	0	97.2	65 - 135			
Surr: 1,2-Dichloroethane-d4	464900	50000	500000	0	93.0	70 - 126			
Surr: 4-Bromofluorobenzene	464300	50000	500000	0	92.9	82 - 124			
Surr: Dibromofluoromethane	450500	50000	500000	0	90.1	77 - 123			
Surr: Toluene-d8	461600	50000	500000	0	92.3	82 - 127			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MSD	Sample ID: HS24020176-01MSD	Units: ug/L		Analysis Date: 06-Feb-2024 12:26					
Client ID:	Run ID: VOA9_458125		SeqNo: 7816262		PrepDate:		DF: 10000		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
1,1,1-Trichloroethane	196900	50000	200000	0	98.4	70 - 130	196700	0.0732	20
1,1,2,2-Tetrachloroethane	223700	50000	200000	0	112	70 - 123	213900	4.48	20
1,1,2-Trichloroethane	209400	50000	200000	0	105	70 - 117	205200	1.99	20
1,1-Dichloroethane	190700	50000	200000	0	95.4	70 - 127	186200	2.41	20
1,1-Dichloroethene	186300	50000	200000	0	93.1	70 - 130	189200	1.54	20
1,2-Dibromoethane	208700	50000	200000	0	104	70 - 124	202100	3.2	20
1,2-Dichlorobenzene	195900	50000	200000	15770	90.1	70 - 115	196000	0.0359	20
1,2-Dichloroethane	212700	50000	200000	13740	99.5	70 - 127	202900	4.71	20
1,2-Dichloropropane	197000	50000	200000	292300	-47.7	70 - 122	198900	0.976	20 S
1,3-Dichlorobenzene	198800	50000	200000	20900	88.9	70 - 119	193200	2.82	20
1,4-Dichlorobenzene	194500	50000	200000	16180	89.2	70 - 114	193900	0.309	20
2-Butanone	452000	100000	400000	0	113	70 - 130	405700	10.8	20
2-Chloroethyl vinyl ether	425500	100000	400000	0	106	65 - 135	360900	16.4	20
Acetonitrile	1843000	500000	2e+006	115200	86.4	70 - 130	1776000	3.7	20
Acrolein	454800	200000	400000	0	114	70 - 130	441400	2.98	20
Acrylonitrile	696000	100000	400000	266300	107	70 - 130	654300	6.18	20
Benzene	198800	50000	200000	16210	91.3	70 - 127	194000	2.44	20
Benzyl Chloride	159000	50000	200000	0	79.5	70 - 130	162900	2.41	20
Bromodichloromethane	199700	50000	200000	0	99.9	70 - 124	198100	0.822	20
Bromoform	206300	50000	200000	0	103	70 - 129	192500	6.91	20
Bromomethane	196000	50000	200000	2086	97.0	70 - 130	204100	4.04	20
Carbon disulfide	357100	100000	400000	0	89.3	70 - 130	353000	1.16	20
Carbon tetrachloride	203500	50000	200000	95300	54.1	70 - 130	202900	0.267	20 S
Chlorobenzene	199100	50000	200000	0	99.6	70 - 114	199600	0.235	20
Chloroethane	180000	50000	200000	19450	80.3	70 - 130	180800	0.435	20
Chloroform	198800	50000	200000	0	99.4	70 - 125	192000	3.47	20
Chloromethane	195100	50000	200000	7565	93.8	70 - 130	195800	0.376	20
cis-1,3-Dichloropropene	183900	50000	200000	0	92.0	70 - 125	181200	1.5	20
Dibromochloromethane	201600	50000	200000	0	101	70 - 124	194800	3.42	20
Dibromomethane	213100	50000	200000	0	107	70 - 124	198100	7.32	20
Ethylbenzene	195600	50000	200000	0	97.8	70 - 124	194600	0.474	20
Hexachlorobutadiene	200100	50000	200000	0	100	70 - 130	192300	3.94	20
Methylene chloride	194400	100000	200000	15160	89.6	70 - 128	189400	2.59	20
Styrene	193700	50000	200000	17730	88.0	70 - 130	186700	3.66	20

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458125 (0)		Instrument: VOA9		Method: VOLATILES					
MSD		Sample ID: HS24020176-01MSD		Units: ug/L		Analysis Date: 06-Feb-2024 12:26			
Client ID:		Run ID: VOA9_458125		SeqNo: 7816262		PrepDate:		DF: 10000	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Tetrachloroethene	193500	50000	200000	0	96.7	70 - 130	205200	5.89	20
Toluene	197300	50000	200000	0	98.7	70 - 123	196200	0.581	20
trans-1,2-Dichloroethene	182200	50000	200000	0	91.1	70 - 130	181000	0.694	20
trans-1,3-Dichloropropene	189000	50000	200000	0	94.5	70 - 121	185400	1.92	20
Trichloroethene	197400	50000	200000	0	98.7	70 - 129	201400	1.99	20
Vinyl chloride	183100	20000	200000	17160	83.0	70 - 130	176800	3.48	20
Xylenes, Total	585500	50000	600000	0	97.6	70 - 130	584400	0.186	20
Total Trihalomethanes (TTHMs)	806300	50000	800000	0	101	65 - 135	777400	3.66	30
Surr: 1,2-Dichloroethane-d4	482400	50000	500000	0	96.5	70 - 126	464900	3.7	20
Surr: 4-Bromofluorobenzene	454700	50000	500000	0	90.9	82 - 124	464300	2.07	20
Surr: Dibromofluoromethane	466900	50000	500000	0	93.4	77 - 123	450500	3.58	20
Surr: Toluene-d8	455500	50000	500000	0	91.1	82 - 127	461600	1.34	20
The following samples were analyzed in this batch: HS24020181-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458126 (0)		Instrument: VOA9		Method: VOLATILES - SW8260C					
MBLK	Sample ID: VBLKW-240206	Units: ug/L		Analysis Date: 06-Feb-2024 10:56					
Client ID:	Run ID: VOA9_458126	SeqNo: 7816266		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	U	10							
Propylene oxide	U	10							
Surr: 1,2-Dichloroethane-d4	42.77	0	50	0	85.5	70 - 130			
Surr: 4-Bromofluorobenzene	47.77	0	50	0	95.5	82 - 115			
Surr: Dibromofluoromethane	41.83	0	50	0	83.7	73 - 126			
Surr: Toluene-d8	48.77	0	50	0	97.5	81 - 120			

LCS	Sample ID: VLCSW-240206	Units: ug/L		Analysis Date: 06-Feb-2024 10:10					
Client ID:	Run ID: VOA9_458126	SeqNo: 7816265		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	81.54	10	100	0	81.5	60 - 140			
Propylene oxide	49.9	10	40	0	125	60 - 139			
Surr: 1,2-Dichloroethane-d4	53.51	0	50	0	107	70 - 130			
Surr: 4-Bromofluorobenzene	51.46	0	50	0	103	82 - 115			
Surr: Dibromofluoromethane	51.42	0	50	0	103	73 - 126			
Surr: Toluene-d8	50.66	0	50	0	101	81 - 120			

MS	Sample ID: HS24020176-01MS	Units: ug/L		Analysis Date: 06-Feb-2024 12:04					
Client ID:	Run ID: VOA9_458126	SeqNo: 7816269		PrepDate:		DF: 10000			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	705100	100000	1e+006	0	70.5	60 - 140			
Propylene oxide	425400	100000	400000	0	106	60 - 139			
Surr: 1,2-Dichloroethane-d4	464900	0	500000	0	93.0	70 - 126			
Surr: 4-Bromofluorobenzene	464300	0	500000	0	92.9	82 - 124			
Surr: Dibromofluoromethane	450500	0	500000	0	90.1	77 - 123			
Surr: Toluene-d8	461600	0	500000	0	92.3	82 - 127			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458126 (0)		Instrument: VOA9		Method: VOLATILES - SW8260C					
MSD	Sample ID: HS24020176-01MSD	Units: ug/L		Analysis Date: 06-Feb-2024 12:26					
Client ID:	Run ID: VOA9_458126		SeqNo: 7816270		PrepDate:		DF: 10000		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acetaldehyde	819900	100000	1e+006	0	82.0	60 - 140	705100	15.1	20
Propylene oxide	392800	100000	400000	0	98.2	60 - 139	425400	7.95	20
Surr: 1,2-Dichloroethane-d4	482400	0	500000	0	96.5	70 - 126	464900	3.7	20
Surr: 4-Bromofluorobenzene	454700	0	500000	0	90.9	82 - 124	464300	2.07	20
Surr: Dibromofluoromethane	466900	0	500000	0	93.4	77 - 123	450500	3.58	20
Surr: Toluene-d8	455500	0	500000	0	91.1	82 - 127	461600	1.34	20
The following samples were analyzed in this batch: HS24020181-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 206942 (0)		Instrument: Skalar 02		Method: BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011					
MBLK	Sample ID: MBLK-206942	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458828		SeqNo: 7831312		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206942	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458828		SeqNo: 7831311		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	175.1	2.00	198	0	88.4	85 - 115			

DUP	Sample ID: HS24020184-02DUP	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458828		SeqNo: 7831310		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00					1.01	0	20

The following samples were analyzed in this batch: HS24020181-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 206943 (0)		Instrument: Skalar 02		Method: CBOD BY SM5210B-2011					
MBLK	Sample ID: MBLK-206943	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458831		SeqNo: 7831342		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-206943	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458831		SeqNo: 7831341		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	179.6	2.00	198	0	90.7	85 - 115			

DUP	Sample ID: HS24020180-02DUP	Units: mg/L		Analysis Date: 10-Feb-2024 12:00					
Client ID:	Run ID: Skalar 02_458831		SeqNo: 7831340		PrepDate: 05-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00					1.04	0	20

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: 207037 (0)		Instrument: UV-2450		Method: SURFACTANTS (MBAS) BY SM5540C						
MBLK	Sample ID: MBLK-207037	Units: mg/L 340 MW LAS		Analysis Date: 07-Feb-2024 08:49						
Client ID:	Run ID: UV-2450_458236		SeqNo: 7818633		PrepDate: 06-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	U	0.0500								
LCS	Sample ID: LCS-207037	Units: mg/L 340 MW LAS		Analysis Date: 07-Feb-2024 08:49						
Client ID:	Run ID: UV-2450_458236		SeqNo: 7818631		PrepDate: 06-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.531	0.0500	0.5	0	106	85 - 115				
LCSD	Sample ID: LCSD-207037	Units: mg/L 340 MW LAS		Analysis Date: 07-Feb-2024 08:49						
Client ID:	Run ID: UV-2450_458236		SeqNo: 7818632		PrepDate: 06-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.537	0.0500	0.5	0	107	85 - 115	0.531	1.12	20	
MS	Sample ID: HS24020181-01MS	Units: mg/L 340 MW LAS		Analysis Date: 07-Feb-2024 08:49						
Client ID: OF001 WK 3	Run ID: UV-2450_458236		SeqNo: 7818630		PrepDate: 06-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
MBAS	0.553	0.0500	0.5	0.08	94.6	80 - 120				
The following samples were analyzed in this batch: HS24020181-01										

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 207525 (0)		Instrument: WetChem_HS		Method: TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011					
MBLK	Sample ID: MBLK-207525	Units: mg/L		Analysis Date: 16-Feb-2024 15:46					
Client ID:	Run ID: WetChem_HS_459107		SeqNo: 7836835		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		U	0.50						

LCS	Sample ID: LCS-207525	Units: mg/L		Analysis Date: 16-Feb-2024 15:46					
Client ID:	Run ID: WetChem_HS_459107		SeqNo: 7836833		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		18.9	0.50	20	0	94.5	85 - 115		

LCSD	Sample ID: LCSD-207525	Units: mg/L		Analysis Date: 16-Feb-2024 15:46					
Client ID:	Run ID: WetChem_HS_459107		SeqNo: 7836834		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		21.68	0.50	20	0	108	85 - 115	18.9	13.7 20

MS	Sample ID: HS24020122-02MS	Units: mg/L		Analysis Date: 16-Feb-2024 15:46					
Client ID:	Run ID: WetChem_HS_459107		SeqNo: 7836831		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		19.33	0.50	20	0.456	94.4	75 - 125		

MSD	Sample ID: HS24020122-02MSD	Units: mg/L		Analysis Date: 16-Feb-2024 15:46					
Client ID:	Run ID: WetChem_HS_459107		SeqNo: 7836832		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		20.08	0.50	20	0.456	98.1	75 - 125	19.33	3.78 20

The following samples were analyzed in this batch: HS24020181-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK3

WorkOrder:HS24020181

QC BATCH REPORT

Batch ID: 207527 (0)		Instrument: UV-2450		Method: AMMONIA AS N BY SM4500 NH3-B-F-2011					
MBLK	Sample ID: MBLK-207527	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836947		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	U	0.050							
LCS	Sample ID: LCS-207527	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836944		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.529	0.050	0.5	0	106	85 - 115			
LCSD	Sample ID: LCSD-207527	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836945		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.535	0.050	0.5	0	107	85 - 115	0.529	1.13	20
MS	Sample ID: HS24020478-01MS	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836942		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.58	0.050	0.5	0.048	106	80 - 120			
MS	Sample ID: HS24020320-03MS	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836940		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	3.815	0.25	2.5	2.12	67.8	80 - 120			S
MSD	Sample ID: HS24020478-01MSD	Units: mg/L		Analysis Date: 16-Feb-2024 16:22					
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836943		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)	0.58	0.050	0.5	0.048	106	80 - 120	0.58	0	20

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: 207527 (0)		Instrument: UV-2450		Method: AMMONIA AS N BY SM4500 NH3-B-F-2011						
MSD	Sample ID: HS24020320-03MSD	Units: mg/L		Analysis Date: 16-Feb-2024 16:22						
Client ID:	Run ID: UV-2450_459109		SeqNo: 7836941		PrepDate: 16-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (as N)	3.835	0.25	2.5	2.12	68.6	80 - 120	3.815	0.523	20	S
The following samples were analyzed in this batch: HS24020181-01										

Client:ChampionX LLC

Project:2024 Permit Renewal-WK3

WorkOrder:HS24020181

QC BATCH REPORT

Batch ID: 207544 (0)		Instrument: UV-2450		Method: CYANIDE BY SM 4500CN E&G-2011					
MBLK	Sample ID: MBLK-207544	Units: mg/L		Analysis Date: 17-Feb-2024 15:41					
Client ID:	Run ID: UV-2450_459252		SeqNo: 7840586		PrepDate: 17-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	U	0.00500							

LCS	Sample ID: LCS-207544	Units: mg/L		Analysis Date: 17-Feb-2024 15:41					
Client ID:	Run ID: UV-2450_459252		SeqNo: 7840585		PrepDate: 17-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.211	0.00500	0.2	0	106	80 - 120			

MS	Sample ID: HS24020770-01MS	Units: mg/L		Analysis Date: 17-Feb-2024 15:41					
Client ID:	Run ID: UV-2450_459252		SeqNo: 7840583		PrepDate: 17-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.218	0.00500	0.2	0.004	107	80 - 120			

MSD	Sample ID: HS24020770-01MSD	Units: mg/L		Analysis Date: 17-Feb-2024 15:41					
Client ID:	Run ID: UV-2450_459252		SeqNo: 7840584		PrepDate: 17-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.221	0.00500	0.2	0.004	108	80 - 120	0.218	1.37	20

The following samples were analyzed in this batch:HS24020181-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK3

WorkOrder:HS24020181

QC BATCH REPORT

Batch ID: R458099 (0)		Instrument: WetChem_HS		Method: COLOR BY SM 2120B - 2011					
MBLK	Sample ID: MBLK-R458099	Units: Color Units		Analysis Date: 05-Feb-2024 16:35					
Client ID:	Run ID: WetChem_HS_458099		SeqNo: 7815715		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Color, Apparent	U	5.00							
pH	5	0.100							

LCS	Sample ID: LCS-R458099	Units: Color Units		Analysis Date: 05-Feb-2024 16:35					
Client ID:	Run ID: WetChem_HS_458099		SeqNo: 7815714		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115			

LCSD	Sample ID: LCSD-R458099	Units: Color Units		Analysis Date: 05-Feb-2024 16:35					
Client ID:	Run ID: WetChem_HS_458099		SeqNo: 7815713		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115	50	0	20

DUP	Sample ID: HS24020181-01DUP	Units: Color Units		Analysis Date: 05-Feb-2024 16:35					
Client ID: OF001 WK 3	Run ID: WetChem_HS_458099		SeqNo: 7815716		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Color, Apparent	55	5.00					55	0	20
pH	6	0.100					0	0	

The following samples were analyzed in this batch:

HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458175 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 06-Feb-2024 12:13					
Client ID:	Run ID: ICS-Integrion_458175		SeqNo: 7817442		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	U	0.100							
Chloride	U	0.500							
Fluoride	U	0.100							
Nitrogen, Nitrate (As N)	U	0.100							
Nitrogen, Nitrite (As N)	U	0.100							
Sulfate	U	0.500							

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 06-Feb-2024 12:19					
Client ID:	Run ID: ICS-Integrion_458175		SeqNo: 7817443		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	4.048	0.100	4	0	101	90 - 110			
Chloride	19.68	0.500	20	0	98.4	90 - 110			
Fluoride	4.085	0.100	4	0	102	90 - 110			
Nitrogen, Nitrate (As N)	3.918	0.100	4	0	98.0	90 - 110			
Nitrogen, Nitrite (As N)	4.005	0.100	4	0	100	90 - 110			
Sulfate	19.98	0.500	20	0	99.9	90 - 110			

MS	Sample ID: HS24020181-01MS	Units: mg/L		Analysis Date: 06-Feb-2024 12:37					
Client ID: OF001 WK 3	Run ID: ICS-Integrion_458175		SeqNo: 7817445		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	2.911	0.100	2	0.8553	103	80 - 120			
Chloride	39.06	0.500	10	29.88	91.9	80 - 120			
Fluoride	2.305	0.100	2	0.0982	110	80 - 120			
Nitrogen, Nitrate (As N)	2.092	0.100	2	0.1777	95.7	80 - 120			
Nitrogen, Nitrite (As N)	1.907	0.100	2	0.0147	94.6	80 - 120			
Sulfate	25.37	0.500	10	15.64	97.3	80 - 120			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458175 (0)	Instrument: ICS-Integrion	Method: ANIONS BY E300.0, REV 2.1, 1993
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MS	Sample ID: HS24011543-01MS			Units: mg/L		Analysis Date: 06-Feb-2024 15:23			
Client ID:	Run ID: ICS-Integrion_458175			SeqNo: 7817467		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	1.827	0.100	2	0	91.3	80 - 120			
Chloride	28.59	0.500	10	18.86	97.3	80 - 120			
Fluoride	2.524	0.100	2	0.4376	104	80 - 120			
Nitrogen, Nitrate (As N)	5.801	0.100	2	4.08	86.1	80 - 120			
Nitrogen, Nitrite (As N)	1.927	0.100	2	0.058	93.4	80 - 120			
Sulfate	39.72	0.500	10	31.3	84.2	80 - 120			

MSD	Sample ID: HS24020181-01MSD			Units: mg/L		Analysis Date: 06-Feb-2024 12:42			
Client ID: OF001 WK 3	Run ID: ICS-Integrion_458175			SeqNo: 7817446		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	2.944	0.100	2	0.8553	104	80 - 120	2.911	1.14	20
Chloride	39.04	0.500	10	29.88	91.6	80 - 120	39.06	0.0666	20
Fluoride	2.242	0.100	2	0.0982	107	80 - 120	2.305	2.76	20
Nitrogen, Nitrate (As N)	2.088	0.100	2	0.1777	95.5	80 - 120	2.092	0.201	20
Nitrogen, Nitrite (As N)	1.904	0.100	2	0.0147	94.5	80 - 120	1.907	0.157	20
Sulfate	25.44	0.500	10	15.64	98.0	80 - 120	25.37	0.279	20

MSD	Sample ID: HS24011543-01MSD			Units: mg/L		Analysis Date: 06-Feb-2024 15:29			
Client ID:	Run ID: ICS-Integrion_458175			SeqNo: 7817468		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	1.87	0.100	2	0	93.5	80 - 120	1.827	2.34	20
Chloride	28.6	0.500	10	18.86	97.4	80 - 120	28.59	0.014	20
Fluoride	2.497	0.100	2	0.4376	103	80 - 120	2.524	1.06	20
Nitrogen, Nitrate (As N)	5.815	0.100	2	4.08	86.8	80 - 120	5.801	0.239	20
Nitrogen, Nitrite (As N)	1.928	0.100	2	0.058	93.5	80 - 120	1.927	0.0519	20
Sulfate	39.85	0.500	10	31.3	85.4	80 - 120	39.72	0.325	20

The following samples were analyzed in this batch:

HS24020181-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458442 (0)		Instrument: ICS-Integrion		Method: NITRATE/NITRITE BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 09-Feb-2024 07:18					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823266		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		U	0.200						

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 09-Feb-2024 07:24					
Client ID:	Run ID: ICS-Integrion_458442		SeqNo: 7823267		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		7.936	0.200	8	0	99.2	90 - 110		

MS	Sample ID: HS24020181-01MS	Units: mg/L		Analysis Date: 09-Feb-2024 07:36					
Client ID: OF001 WK 3	Run ID: ICS-Integrion_458442		SeqNo: 7823269		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		17.63	1.00	20	0.154	87.4	80 - 120		

MSD	Sample ID: HS24020181-01MSD	Units: mg/L		Analysis Date: 09-Feb-2024 07:42					
Client ID: OF001 WK 3	Run ID: ICS-Integrion_458442		SeqNo: 7823270		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		17.96	1.00	20	0.154	89.0	80 - 120	17.63	1.88 20

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458541 (0)		Instrument: WetChem_HS		Method: SULFIDE BY SM4500 S2-F-2011						
MBLK	Sample ID: MBLK-R458541	Units: mg/L		Analysis Date: 10-Feb-2024 13:00						
Client ID:	Run ID: WetChem_HS_458541		SeqNo: 7825709		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Sulfide	U	2.00								

LCS	Sample ID: LCS-R458541	Units: mg/L		Analysis Date: 10-Feb-2024 13:00						
Client ID:	Run ID: WetChem_HS_458541		SeqNo: 7825708		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Sulfide	21.8	2.00	25	0	87.2	85 - 115				

LCSD	Sample ID: LCSD-R458541	Units: mg/L		Analysis Date: 10-Feb-2024 13:00						
Client ID:	Run ID: WetChem_HS_458541		SeqNo: 7825707		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Sulfide	21.6	2.00	25	0	86.4	85 - 115	21.8	0.922	20	

MS	Sample ID: HS24020271-04MS	Units: mg/L		Analysis Date: 10-Feb-2024 13:00						
Client ID:	Run ID: WetChem_HS_458541		SeqNo: 7825710		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Sulfide	21.8	2.00	25	-1.6	93.6	80 - 120				

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458634 (0)		Instrument: Balance1		Method: TOTAL SUSPENDED SOLIDS BY SM 2540D-2011						
MBLK	Sample ID: WMBLK-02092024	Units: mg/L		Analysis Date: 09-Feb-2024 13:19						
Client ID:	Run ID: Balance1_458634	SeqNo: 7827437		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		U	2.50							
LCS	Sample ID: WLCS-02092024	Units: mg/L		Analysis Date: 09-Feb-2024 13:19						
Client ID:	Run ID: Balance1_458634	SeqNo: 7827436		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		95	2.50	100	0	95.0	85 - 115			
DUP	Sample ID: HS24020469-02DUP	Units: mg/L		Analysis Date: 09-Feb-2024 13:19						
Client ID:	Run ID: Balance1_458634	SeqNo: 7827435		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		132	2.50				120	9.52	20	
DUP	Sample ID: HS24020235-02DUP	Units: mg/L		Analysis Date: 09-Feb-2024 13:19						
Client ID:	Run ID: Balance1_458634	SeqNo: 7827426		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Suspended Solids (Residue, Non-Filterable)		8	2.50				8.286	3.51	20	
The following samples were analyzed in this batch:		HS24020181-01								

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458649 (0)		Instrument: Skalar 02		Method: DISSOLVED OXYGEN BY SM4500-O G					
DUP	Sample ID: HS24020731-01DUP	Units: mg/L		Analysis Date: 13-Feb-2024 13:30					
Client ID:	Run ID: Skalar 02_458649		SeqNo: 7827906		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Oxygen, Dissolved	8.44	1.00					8.33	1.31	20
The following samples were analyzed in this batch: HS24020181-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R458652 (0)		Instrument: WetChem_HS		Method: RESIDUAL CHLORINE BY SM4500CL F-2011					
MBLK	Sample ID: MBLK-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827828		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	U	0.10							

LCS	Sample ID: LCS-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827827		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.4	0.10	3.66	0	92.9	85 - 115			

LCSD	Sample ID: LCSD-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827826		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.4	0.10	3.66	0	92.9	85 - 115	3.4	0	20

MS	Sample ID: HS24020649-01MS	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827829		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.5	0.10	3.66	0.1	92.9	80 - 120			

The following samples were analyzed in this batch: HS24020181-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R458755 (0)		Instrument:	Balance1	Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011						
MBLK	Sample ID:	WMBLK-02122024		Units:	mg/L		Analysis Date: 12-Feb-2024 11:36			
Client ID:		Run ID:	Balance1_458755	SeqNo:	7829968		PrepDate:	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		U	10.0							

LCS	Sample ID:	WLCS-02122024		Units:	mg/L		Analysis Date: 12-Feb-2024 11:36			
Client ID:		Run ID:	Balance1_458755	SeqNo:	7829967		PrepDate:	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		1060	10.0	1000	0	106	85 - 115			

DUP	Sample ID:	HS24020461-03DUP		Units:	mg/L		Analysis Date: 12-Feb-2024 11:36			
Client ID:		Run ID:	Balance1_458755	SeqNo:	7829966		PrepDate:	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		78	10.0					84	7.41	20

DUP	Sample ID:	HS24020260-05DUP		Units:	mg/L		Analysis Date: 12-Feb-2024 11:36			
Client ID:		Run ID:	Balance1_458755	SeqNo:	7829952		PrepDate:	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		21240	10.0					22000	3.52	20

The following samples were analyzed in this batch: HS24020181-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK3

WorkOrder:HS24020181

QC BATCH REPORT

Batch ID: R458816 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993					
MBLK	Sample ID: MBLK-R458816	Units: mg/L		Analysis Date: 14-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_458816		SeqNo: 7831144		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	U	15.0							

LCS	Sample ID: LCS-R458816	Units: mg/L		Analysis Date: 14-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_458816		SeqNo: 7831143		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	101	15.0	100	0	101	85 - 115			

MS	Sample ID: HS24020122-02MS	Units: mg/L		Analysis Date: 14-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_458816		SeqNo: 7831146		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	75	15.0	50	28	94.0	80 - 120			

MSD	Sample ID: HS24020122-02MSD	Units: mg/L		Analysis Date: 14-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_458816		SeqNo: 7831145		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	75	15.0	50	28	94.0	80 - 120	75	0	20

The following samples were analyzed in this batch:HS24020181-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R459005 (0)		Instrument: WetChem_HS		Method: PH BY SM4500H+ B-2011					
DUP	Sample ID: HS24020320-03DUP		Units: pH Units		Analysis Date: 16-Feb-2024 08:10				
Client ID:	Run ID: WetChem_HS_459005		SeqNo: 7835242		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
pH	7.41	0.100					7.38	0.406	10
Temp Deg C @pH	24.9	0					25	0.401	10
The following samples were analyzed in this batch: HS24020181-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R459062 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WMBLK-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 08:00						
Client ID:	Run ID: Balance1_459062	SeqNo: 7836206		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	U	2.00								

LCS	Sample ID: LCS-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 08:00						
Client ID:	Run ID: Balance1_459062	SeqNo: 7836204		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.3	2.00	40	0	101	78 - 114				

LCSD	Sample ID: LCSD-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 08:00						
Client ID:	Run ID: Balance1_459062	SeqNo: 7836205		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	42.9	2.00	40	0	107	78 - 114	40.3	6.25	18	

MS	Sample ID: HS24020632-01MS	Units: mg/L		Analysis Date: 16-Feb-2024 08:00						
Client ID:	Run ID: Balance1_459062	SeqNo: 7836202		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	43	2.00	40	1.081	105	78 - 114				

The following samples were analyzed in this batch: HS24020181-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R459065 (0)		Instrument: WetChem_HS		Method: SULFITE BY SM4500SO3B						
MBLK	Sample ID: MBLK-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836231		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	U	5.00								
LCS	Sample ID: LCS-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836230		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	52	5.00	50	0	104	80 - 120				
LCSD	Sample ID: LCSD-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836229		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	52	5.00	50	0	104	80 - 120	52	0	20	
MS	Sample ID: HS24020649-01MS	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836232		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	51	5.00	50	3	96.0	75 - 125				
The following samples were analyzed in this batch: HS24020181-01										

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

QC BATCH REPORT

Batch ID: R459416 (0)		Instrument: Skalar 03		Method: ALKALINITY BY -2011					
MBLK	Sample ID: MBLK-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 14:15					
Client ID:	Run ID: Skalar 03_459416	SeqNo: 7844159		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3) U 5.00									
LCS	Sample ID: LCS-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 14:21					
Client ID:	Run ID: Skalar 03_459416	SeqNo: 7844160		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3) 945.8 5.00 1000 0 94.6 85 - 115									
LCSD	Sample ID: LCSD-02162024	Units: mg/L		Analysis Date: 16-Feb-2024 14:27					
Client ID:	Run ID: Skalar 03_459416	SeqNo: 7844161		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3) 940 5.00 1000 0 94.0 85 - 115 945.8 0.615 20									
DUP	Sample ID: HS24020293-02DUP	Units: mg/L		Analysis Date: 16-Feb-2024 14:41					
Client ID:	Run ID: Skalar 03_459416	SeqNo: 7844163		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3) 1292 5.00 1298 0.463 20									
The following samples were analyzed in this batch: HS24020181-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

QC BATCH REPORT

Batch ID: R459455 (0)		Instrument: TOC_04		Method: TOTAL ORGANIC CARBON - SM5310B-2011					
MBLK	Sample ID: MBLK-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 11:42					
Client ID:	Run ID: TOC_04_459455	SeqNo: 7844963		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Organic Carbon, Total									
U		1.00							
LCS	Sample ID: LCS-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 11:43					
Client ID:	Run ID: TOC_04_459455	SeqNo: 7844969		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Organic Carbon, Total									
9.746		1.00	10	0	97.5	85 - 115			
LCSD	Sample ID: LCSD-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 11:44					
Client ID:	Run ID: TOC_04_459455	SeqNo: 7844970		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Organic Carbon, Total									
9.822		1.00	10	0	98.2	85 - 115		9.746	0.777 20
MS	Sample ID: HS24020261-02MS	Units: mg/L		Analysis Date: 21-Feb-2024 15:30					
Client ID:	Run ID: TOC_04_459455	SeqNo: 7844978		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Organic Carbon, Total									
11.59		1.00	10	1.492	101	80 - 120			
The following samples were analyzed in this batch:		HS24020181-01							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
WorkOrder: HS24020181

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L22-90-R2	31-Mar-2024
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

Sample Receipt Checklist

Work Order ID: HS24020181

Date/Time Received: 05-Feb-2024 14:10

Client Name: Nalco Freeport

Received by: Donald Gilmore

Completed By: /S/ Jacob Coronado

05-Feb-2024 16:46

Reviewed by:

eSignature

Date/Time

eSignature

Date/Time

Matrices:

Carrier name: ALS Courier

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☐

No ☐

Not Present ☒

Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

VOA/TX1005/TX1006 Solids in hermetically sealed vials?

Yes ☐

No ☐

Not Present ☒

Chain of custody present?

Yes ☒

No ☐

1 Page(s)

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

COC IDs:312465

Samplers name present on COC?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☐

No ☒

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

Temperature(s)/Thermometer(s):

0.7uc/0.6c, 1.1uc/1.0c

ir31

Cooler(s)/Kit(s):

Blue, Blue

Date/Time sample(s) sent to storage:

02/05/2024 1700

Water - VOA vials have zero headspace?

Yes ☒

No ☐

No VOA vials submitted ☐

Water - pH acceptable upon receipt?

Yes ☒

No ☐

N/A ☐

pH adjusted?

Yes ☐

No ☒

N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:

HS24020181

ChampionX LLC

2024 Permit Renewal-WK3

Chain of Custody Form

Page ____ of ____

CQC ID: 312465

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South
+1 717 944 5541Yo
+1 717 944 5541SHORT
HOLDING
TIME

ALS Project Manager:		ALS Work Order #:	
Project Information			
Parameter/Method Request for Analysis			
Purchase Order	450443658	Project Name	2024 Permit Renewal
Work Order		Project Number	
Company Name	Nalco Company	Bill To Company	ChampionX LLC
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380
Address	PO Box 2167	Address	PO Box 2167
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542
Phone	(979) 239-5800	Phone	(979) 239-5800
Fax	(979) 233-6767	Fax	(979) 233-6767
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com
A PCB 608, SVOC 625, VOC 624/8260_W		B 200.8 (Metals), 8015 (Amines)	
C BOD, CBOD, 300_W(NO3,SO4,Cl,F, Br), pH/Color		D COD, TOC, TON (Ammonia, TKN), CN_TW	
E O&G, Total Phosphorus, Sulfide, Surfactants		F TSS, TDS, ALK, Cr3_W, DO, Sulfite, Res Chlorine	
G Sub E.Coli and Enterococci to Envirodyne		H Available Cyanide (Sub to Holland, MI)	
I Low level Mercury (Sub to Holland, MI)		J Low Level HexChrome (Sub to ESC)/Sub Formaldehyde A&B	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF001 WK3	2/5/24		W		7	X										
2	OF001 WK3	2/5/24		W		1		X									
3	OF001 WK3	2/5/24		W		4			X								
4	OF001 WK3	2/5/24		W		4				X							
5	OF001 WK3	2/5/24		W		4					X						
6	OF001 WK3	2/5/24		W		6						X					
7	OF001 WK3	2/5/24	0900	W		4							X				
8	OF001 WK3	2/5/24		W		1								X			
9	OF001 WK3	2/5/24		W		13									X		
10	OF001 WK3	2/5/24		W		3										X	

Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)		Results Due Date:	
Marcy Putnam		P/U ALS		<input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour			
Relinquished by:		Date:	Time:	Received by:		Notes:	
D.S.		2-5-24	1155	D.S.		Annual Permit Renewal	
Relinquished by:		Date:	Time:	Received by (Laboratory):			
D.S.		2-5-24	1410	D.S.			
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):			
Cooler ID: Blue Cooler Temp: 0-7 QC Package: (Check One Box Below) <input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW846/CLP <input type="checkbox"/> Other							
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035							

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

15 February 2024

ALS Group USA, Corp.
Attn: Accounts Payable
10450 Stancliff Rd. Suite #210
Houston, TX 77099

ALS

Enclosed are the results of analyses for samples received by the laboratory on 05-Feb-24 15:45. The analytical data provided relates only to the samples as received in this laboratory report.

ELI certifies that all results are NELAP compliant and performed in accordance with the referenced method except as noted in the Case Narrative or as noted with a qualifier. Any reproductions of this laboratory report should be in full and only with the written authorization from the client.

The total number of pages in this report is 5

Thank you for selecting ELI for your analytical needs. If you have any questions regarding this report, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read 'Julie Peterson'.

Julie Peterson
Client Services Representative



Certificate No: T104704265-22-20



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B0750

Reported:
15-Feb-24 11:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HS 24020181-01 OF001 Wk 3	24B0750-01	Water	05-Feb-24 09:00	05-Feb-24 15:45

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B0750

Reported:
15-Feb-24 11:06

HS 24020181-01 OF001 Wk 3
24B0750-01 (Water) Sampled: 05-Feb-24 09:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Analyst	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	---------	-------

Envirodyne Laboratories, Inc.

Microbiology

E.coli	380	10	MPN/100 mL	10	B4B3682	05-Feb-24	05-Feb-24 16:47	SM9223 B	LTB	Q
Enterococci	140	10	MPN/100 mL	10	B4B3687	05-Feb-24	05-Feb-24 16:00	Enterolert	LN	

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B0750

Reported:
15-Feb-24 11:06

Microbiology - Quality Control
Envirodyne Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B4B3682 - Microbiology

Blank (B4B3682-BLK1)		Prepared & Analyzed: 13-Feb-24								
E.coli	<1	1 MPN/100 mL								Q
Duplicate (B4B3682-DUP1)		Source: 24B0321-01		Prepared & Analyzed: 13-Feb-24						
E.coli	<2	2 MPN/100 mL			10.0			0.402		Q

Batch B4B3687 - Microbiology

Blank (B4B3687-BLK1)		Prepared & Analyzed: 05-Feb-24								
Enterococci	<1	1 MPN/100 mL								
Duplicate (B4B3687-DUP1)		Source: 24B0724-01		Prepared & Analyzed: 05-Feb-24						
Enterococci	<1	1 MPN/100 mL			<1			0	0.5366	

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B0750

Reported:
15-Feb-24 11:06

Notes and Definitions

Q QC did not meet ELI acceptance criteria
ND Analyte NOT DETECTED at or above the reporting limit
< Result is less than the RL
a Analyte not available for TNI/NELAP accreditation
n Not accredited

Envirodyne Laboratories, Inc.

A handwritten signature in black ink, appearing to read 'D. Beron', is written over a horizontal line.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



24B 0750

10450 Stancliff Rd, Ste 210
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T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24631

SUBCONTRACT TO:

Envirodyne Laboratories, Inc.
11011 Brooklet, Ste 230
Houston, TX 77099

Phone: +1 281 568 7880

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020181
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS24020181-01	OF001 WK 3	Water	05 Feb 2024 09:00
	SUB_E. Coli			19 Feb 2024
	SUB_Enterococci			19 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: D-2
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 2-5-24 1545
Date/Time: 2/5/24 1545
Temperature(s): 3.2/30 1Rth

RIGHT SOLUTIONS | RIGHT PARTNER

Feb 5, 2024

Page 1 of 1

Laboratory Analysis Report

Total Number of Pages: 6

Job ID : 24020662



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

Client Project Name : HS24020181

Report To : Client Name: ALS Group USA, Corp. P.O.#.:
Attn: Andy C. Neir Sample Collected By:
Client Address: 10450 Stancliff Rd., Ste. 210 Date Collected: 02/05/24
City, State, Zip: Houston, Texas, 77099

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
HS24020181-01 / OF001 WK 3	Water	24020662.01

A handwritten signature in black ink, appearing to read 'S. C. W. K.'.

Released By: Senthilkumar Sevukan
Title: Vice President Operations
Date: 2/9/2024



This Laboratory is NELAP (T104704213-23-31) accredited. Effective: 04/13/2023; Expires: 3/31/2024
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Results apply to the sample as received. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

ab-q210-0321

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 24020662

Date: 2/9/2024

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
J	Estimation. Below calibration range but above MDL	RptLimit	Reporting Limit
LCS	Laboratory Check Standard	SDL	Sample Detection Limit
LCSD	Laboratory Check Standard Duplicate	surr	Surrogate
MS	Matrix Spike	T	Time
MSD	Matrix Spike Duplicate	TNTC	Too numerous to count
MW	Molecular Weight	UQL	Unadjusted Upper Quantitation Limit
MQL	Unadjusted Minimum Quantitation Limit		

Qualifier Definition

M1	Matrix Spike and/or Matrix Spike Duplicate recovery is above laboratory control limits due to matrix interference. "The sample randomly selected as QC for this batch was not part of your project. Therefore, this sample matrix is not applicable to your project samples."
----	---

**LABORATORY TEST RESULTS**

Job ID : 24020662

Date 2/9/2024

Client Name: ALS Group USA, Corp.

Attn: Andy C. Neir

Project Name: HS24020181

Client Sample ID: HS24020181-01 / OF001 WK 3

Job Sample ID: 24020662.01

Date Collected: 02/05/24

Sample Matrix Water

Time Collected: 09:00

Other Information:

Test Method	Parameter/Test Description	Result	Units	DF	Rpt Limit	Reg Limit	Q	Date Time	Analyst
SW-846 8315A	Aldehydes by HPLC								
	Formaldehyde	BRL	mg/L	1.00	0.04			02/08/24 12:43	ARM

QUALITY CONTROL CERTIFICATE



Job ID : 24020662

Date : 2/9/2024

Analysis : Aldehydes by HPLC Method : SW-846 8315A Reporting Units : mg/L

QC Batch ID : Qb24020952 Created Date : 02/08/24 Created By : AMarapadaga

Samples in This QC Batch : 24020662.01

Extraction : PB24020806 Prep Method : SW-846 8315A Prep Date : 02/07/24 11:15 Prep By : Msoria

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	RptLimit	Qual
Formaldehyde	50-00-0	BRL	mg/L	1.00	0.04	

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
Formaldehyde	0.12	0.131	109	0.12	0.133	111	1.8	35	36-140	

QC Type: MS and MSD

QC Sample ID: 24020470.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Formaldehyde	9.15	0.12	9.96	674						10-160	M1



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24637

SUBCONTRACT TO:

A&B Environmental
10100 East Freeway, Ste 100
Houston, TX 77029

Phone: +1 713 453 6060

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:**
Email:

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020181
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24020181-01	OF001 WK 3	Water	05 Feb 2024 09:00
SUB_FORMALDEHYDE			19 Feb 2024

01A

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Job ID:24020662



02/08/2024 ALS Group USA, Corp. ACH

Relinquished By:

[Signature]

Date/Time:

26-24 / 1955

Received By:

[Signature]

Date/Time:

2/6/24 14:58

Cooler ID(s):

Temperature(s):

1.0°C
195



Sample Condition Checklist

A&B JobID : 24020662		Date Received : 02/06/2024		Time Received : 2:55PM			
Client Name : ALS Group USA, Corp.							
Temperature : 1.0°C		Sample pH : NA					
Thermometer ID : IR5		pH Paper ID : NA					
Perservative :		Lot# :					
	Check Points				Yes	No	N/A
1.	Cooler Seal present and signed.					X	
2.	Sample(s) in a cooler.				X		
3.	If yes, ice in cooler.				X		
4.	Sample(s) received with chain-of-custody.				X		
5.	C-O-C signed and dated.				X		
6.	Sample(s) received with signed sample custody seal.					X	
7.	Sample containers arrived intact. (If No comment)				X		
8.	Matrix: Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Solid <input type="checkbox"/> Cassette <input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Badge <input type="checkbox"/> Food <input type="checkbox"/> Other <input type="checkbox"/>						
9.	Samples were received in appropriate container(s)				X		
10.	Sample(s) were received with Proper preservative						X
11.	All samples were tagged or labeled.				X		
12.	Sample ID labels match C-O-C ID's.				X		
13.	Bottle count on C-O-C matches bottles found.				X		
14.	Sample volume is sufficient for analyses requested.				X		
15.	Samples were received with in the hold time.				X		
16.	VOA vials completely filled.						X
17.	Sample accepted.				X		
18.	Has client been contacted about sub-out						X

Comments : Include actions taken to resolve discrepancies/problem:

--

Brought by : Client
Received by : ASmith

Check in by/date : ASmith / 02/06/2024

ab-s005-1123



Project
1091463

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed 02/21/2024
16:35

TABLE OF CONTENTS

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1091463_r03_03_ProjectResults	SPL Kilgore Project P:1091463 C:ALS8 Project Results t:304	2
1091463_r10_05_ProjectQC	SPL Kilgore Project P:1091463 C:ALS8 Project Quality Control Groups	1
1091463_r99_09_CoC__1_of_1	SPL Kilgore CoC ALS8 1091463_1_of_1	4
Total Pages:		8



SAMPLE CROSS REFERENCE

Project

1091463

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed

2/21/2024

Page 1 of 1

Sample	Sample ID	Taken	Time	Received
2272184	HS24020181-01 IF001 WK 3	02/05/2024	09:00:00	02/13/2024

Bottle 01 client supplied 40 ml glass vial(zero headspace)
Bottle 02 client supplied 40 ml glass vial(zero headspace)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 1671	01	1105088	02/19/2024	1105088	02/19/2024

Email: Kilgore.projectmanager@spl-inc.com



ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Page 1 of 2

Project

1091463

Printed: 02/21/2024

RESULTS

Sample Results

2272184	HS24020181-01 IF001 WK 3	Received:	02/13/2024
Non-Potable Water	Collected by: Client	ALS Group USA Corp.	PO:
	Taken: 02/05/2024	09:00:00	

EPA 1671		Prepared:	1105088	02/19/2024	20:24:00	Analyzed	1105088	02/19/2024	20:24:00	KAP
	Parameter	Results	Units	RL		Flags	CAS			Bottle
z	Diethylamine	<50.0	mg/L	50.0			109-89-7			01
z	Dimethylamine	<50.0	mg/L	50.0			124-40-3			01
z	Methylamine	<500	mg/L	500		X	74-89-5			01
z	Trimethylamine	<500	mg/L	500			75-50-3			01

Sample Preparation

2272184	HS24020181-01 IF001 WK 3	Received:	02/13/2024
	02/05/2024		

		Prepared:	02/13/2024	16:33:33	Calculated	02/13/2024	16:33:33	CAL
z	Environmental Fee (per Project)	Verified						
	Cooler Return	Prepared:	02/14/2024	16:00:00	Analyzed	02/14/2024	16:00:00	DRS
z	Return Cooler/No bottles Require	returned						

EPA 1671		Prepared:	1105088	02/19/2024	20:24:00	Analyzed	1105088	02/19/2024	20:24:00	KAP
z	Amines by 1671	Entered								01



Project

1091463

Printed: 02/21/2024

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Qualifiers:

X - Standard reads higher than desired.

We report results on an As Received (or Wet) basis unless marked Dry Weight.

Unless otherwise noted, testing was performed at SPL, Inc.- Kilgore laboratory which holds International, Federal, and state accreditations. Please see our Websites for details.

(N)ELAC - Covered in our NELAC scope of accreditation
z -- Not covered by our NELAC scope of accreditation

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of SPL Kilgore. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Bill Peery

Bill Peery, MS, VP Technical Services



QUALITY CONTROL

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project
1091463

Printed 02/21/2024

Analytical Set **1105088**

EPA 1671

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Diethylamine	1105088	ND	25.0	50.0	mg/L	126003745
Dimethylamine	1105088	ND	50.0	50.0	mg/L	126003745
Methylamine	1105088	ND	500	500	mg/L	126003745
Trimethylamine	1105088	ND	500	500	mg/L	126003745

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Diethylamine	1190	1000	mg/L	119	60.0 - 140	126003744
Diethylamine	1010	1000	mg/L	101	60.0 - 140	126003753
Dimethylamine	1230	1000	mg/L	123	60.0 - 140	126003744
Dimethylamine	795	1000	mg/L	79.5	60.0 - 140	126003753
Methylamine	972	1000	mg/L	97.2	60.0 - 140	126003744
Methylamine	2040	1000	mg/L	204	60.0 - 140 *	126003753
Trimethylamine	998	1000	mg/L	99.8	60.0 - 140	126003744
Trimethylamine	1140	1000	mg/L	114	60.0 - 140	126003753

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Diethylamine	2272188	1050	789	ND	1000	50.0 - 150	105	78.9	mg/L	28.4	30.0
Dimethylamine	2272188	747	1090	ND	1000	50.0 - 130	74.7	109	mg/L	37.3 *	30.0
Methylamine	2272188	703	1110	ND	1000	50.0 - 130	70.3	111	mg/L	44.9 *	30.0
Trimethylamine	2272188	1010	1100	ND	1000	50.0 - 130	101	110	mg/L	8.53	30.0

* Out RPD is Relative Percent Difference: $\text{abs}(r1-r2) / \text{mean}(r1,r2) * 100\%$

Recover% is Recovery Percent: $\text{result} / \text{known} * 100\%$

Blank - Method Blank (reagent water or other blank matrices that contains all reagents except standard(s) and is processed simultaneously with and under the same conditions as samples; carried through preparation and analytical procedures exactly like a sample; monitors); CCV - Continuing Calibration Verification (same standard used to prepare the curve; typically a mid-range concentration; verifies the continued validity of the calibration curve); MSD - Matrix Spike Duplicate (replicate of the matrix spike; same solution and amount of target analyte added to the MS is added to a third aliquot of sample; quantifies matrix bias and precision.)



1091463 CoC Print Group 001 of 001



10450 Standcliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24729

SUBCONTRACT TO:

SPL
2600 Dudley Rd
Kilgore, TX 75662

Phone: +1 903 984 0551

2272184

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

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Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020181
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24020181-01	OF001 WK 3	Water	05 Feb 2024 09:00
See Quote attsched			19 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

See Attached for
Tracking # and Temp

Relinquished By:

Received By:

Cooler ID(s):

Kathy Tarver SPL, Inc.

Date/Time:

Date/Time:

Temperature(s):

2/12/24 1800

2/13/24 1030

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Page 1 of 1

12 Feb 2024

Report Page 6 of 9

1091463 CoC Print Group 001 of 001

2600 Dudley Rd. Kilgore, Texas 75662
 24 Waterway Avenue, Suite 375 The Woodlands, TX 77380
 Office: 903-984-0554 * Fax: 903-984-5914



SPL
 The Science of Sure

Printed 01/29/2024 Page 1 of 1

COC REPORTING LIMITS

		(ug/L)			
Test	Name	MDL	MQL	Target/MAL	Method
AL88	109 Amines				Non-Potable Water
TCEQ Wastewater 2010 MALs (RG-194, Jan 2012)					

!FWA

!Dea	Diethylamine	25000	50000	50000	EPA 1671 CAS:109-89-7
!Dma	Dimethylamine	50000	50000	50000	EPA 1671 CAS:124-40-3
!Mma	Methylamine	500000	500000	50000 *	EPA 1671 CAS:74-89-5
!Tma	Trimethylamine	500000	500000		EPA 1671 CAS:75-50-3

Achievable reporting limits may vary with dilutions in accord with the sample matrix and listed method requirements

MQL is the Method Quantitation Limit and corresponds to a low standard	COC is Chain of Custody
SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)	MDL is Method Detection Limit (40 CFR 136 Appendix B)
MAL is minimum analytical limit and is the selected target limit	ug/L is micrograms per liter

1091463 CoC Print Group 001 of 001

**Must Deliver Next Business Day
Time and Temperature Sensitive!**

ALS

ORIGIN ID: SGRA (281) 530-5656
SAMPLE RECEIVING
ALS GROUP USA, CORP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12FEB24
ACTWT: 5.25 LB
CAD: 0221247/CAFE3755

BILL THIRD PARTY

TO **SAMPLE RECEIVING
SPL - KILGORE
2600 DUDLEY RD
KILGORE TX 75662**

(903) 884-0551
REF: HS24020181/849 - AN

**FedEx
Express**

E

TRK# 6862 6802 1193

**TUE - 13 FEB 10:30A
PRIORITY OVERNIGHT**

AH

2/13/10 45 KT

Date Time Tech
Temp: 0.5/0.5 C

Therm#: 7242 Corr Fact: 0.0 C

5662
SHV

ALS Environmental - Houston, TX

Sample Delivery Group: L1702866
Samples Received: 02/07/2024
Project Number: HS24020181
Description:
Site: 001
Report To: Andy Neir
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Entire Report Reviewed By:



Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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OF001 WK 3 L1702866-01	9
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¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Tr
⁶ Sr
⁷ Qc
⁸ Gl
⁹ Al
¹⁰ Sc

SAMPLE SUMMARY

OF001 WK 3 L1702866-01 WW

Collected by

Collected date/time

Received date/time

02/05/24 09:00

02/07/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 218.6M	WG2222222	1	02/12/24 10:51	02/12/24 10:51	SET	Mt. Juliet, TN

¹Cp ${}^2\text{Tc}$ ${}^3\text{Ss}$ ${}^4\text{Cn}$ ${}^5\text{Tr}$ ${}^6\text{Sr}$ ${}^7\text{Qc}$ ${}^8\text{Gf}$ ${}^9\text{Al}$ ^{10}Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Jason Romer
Project Manager



Laboratory Data Package Cover Page

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
 - a. Items consistent with NELAC Chapter 5,
 - b. dilution factors,
 - c. preparation methods,
 - d. cleanup methods, and
 - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
 - a. Calculated recovery (%R), and
 - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
 - a. LCS spiking amounts,
 - b. Calculated %R for each analyte, and
 - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a. Samples associated with the MS/MSD clearly identified,
 - b. MS/MSD spiking amounts,
 - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d. Calculated %Rs and relative percent differences (RPDs), and
 - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
 - a. The amount of analyte measured in the duplicate,
 - b. The calculated RPD, and
 - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.



Jason Romer
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National			LRC Date: 02/12/2024 17:42				
Project Name:			Laboratory Job Number: L1702866-01				
Reviewer Name: Jason Romer			Prep Batch Number(s): WG2222222				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National			LRC Date: 02/12/2024 17:42				
Project Name:			Laboratory Job Number: L1702866-01				
Reviewer Name: Jason Romer			Prep Batch Number(s): WG2222222				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?			X		
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National		LRC Date: 02/12/2024 17:42	
Project Name:		Laboratory Job Number: L1702866-01	
Reviewer Name: Jason Romer		Prep Batch Number(s): WG2222222	
ER # ¹	Description		
1	218.6M WG2222222 Hexavalent Chromium: Percent Recovery is outside of established control limits.		
1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period. 2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable); 3. NA = Not applicable; 4. NR = Not reviewed; 5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).			

Wet Chemistry by Method 218.6M

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.000150	0.000500	0.000500	1	02/12/2024 10:51	WG2222222

- 1Cp
- 2Tc
- 3Ss
- 4Cn
- 5Tr
- 6Sr
- 7Qc
- 8Gl
- 9Al
- 10Sc

Method Blank (MB)

(MB) R4032617-1 02/12/24 10:07

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexavalent Chromium	U		0.000150	0.000500

L1703132-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1703132-01 02/12/24 11:13 • (DUP) R4032617-4 02/12/24 11:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.000281	0.000259	1	8.38	J	20

L1703553-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1703553-01 02/12/24 13:14 • (DUP) R4032617-5 02/12/24 13:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4032617-2 02/12/24 10:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	0.00200	0.00193	96.5	90.0-110	

L1702859-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1702859-01 02/12/24 10:29 • (MS) R4032617-3 02/12/24 10:40

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	0.0500	U	0.0446	89.2	1	90.0-110	J6

L1704445-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1704445-14 02/12/24 15:14 • (MS) R4032617-6 02/12/24 15:25 • (MSD) R4032617-7 02/12/24 15:36

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.0500	U	0.0445	0.0447	89.0	89.5	1	90.0-110	J6	J6	0.507	20

1Cp

2Tc

3Ss

4Cn

5Tr

6Sr

7Qc

8Gl

9Al

10Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.



ACCREDITATIONS & LOCATIONS

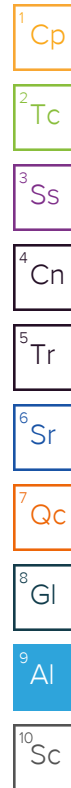
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





Subcontract Chain of Custody

10450 Stancilff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

SAMPLING STATE: Texas

COC ID: 24636

SUBCONTRACT TO:

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

D165

Phone: +1 (61) 7 8-58

1702900

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020181
TSR: Houston House Acct

LAB SAMPLE ID CLIENT SAMPLE ID
ANALYSIS REQUESTED

MATRIX

COLLECT DATE

1. HS24020181-01 OF001 WK 3

Water

05 Feb 2024 09:00

Low-level 218.6-ESC

19 Feb 2024

78

Page 106 of 138

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

PH-108BD-H6021 TRC-2362362
CR6-20221V

Sample Receipt Checklist
COC Seal Present/Intact: ☒ Y
COC Signed/Accurate: ☒ Y
Bottles active/Intact: ☒ Y
Correct bottles used: ☒ Y
Sufficient volume sent: ☒ Y
RA screen <0.5 m/hr: ☒ Y

3.250=3.2 PF
168021801 9208

Relinquished By:

Received By:

Cooler ID(s):

Handy Solutions

Date/Time:

2/6/24 1800-

Date/Time:

2/7/24 0900

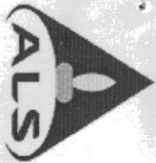
Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

05 Feb 2024

Page 1 of 1

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Purchase Order

10450 Stancilff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

L7702sdc
PO: HS24020181

VENDOR:

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

Phone: +1 (61) 7 8-58

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancilff Rd, Ste 210
Phone: +1 281 530 5656
Reference: 24636
TSR: Houston House Acct

Item	Catalog No	Unit Price	Quantity	Ext Price
1. Low-level 218.6-ESC	E218.6		1	

Order Total:



right solutions.
right partner.

February 13, 2024

Andrew Neir
ALS Environmental
10450 Stancliff Rd
Suite 210
Houston, TX 77099

Re: **HS24020181**

Work Order: **HN2400179**

Dear Andrew,
Enclosed are the results of the sample(s) submitted to our laboratory.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to contact me:
ADDRESS: 3352 128th Avenue, Holland, MI, USA PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Chelsey Cook

/S/ Chelsey Cook

Project Manager



Narrative Documents

Client: ALS Environmental
Project: HS24020181
Sample Matrix: Water

Work Order: HN2400179
Date Received: 06-Feb-2024

CASE NARRATIVE

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 06-Feb-2024. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Inorganics:

No significant anomalies were noted with this analysis.



SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting limits.

For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: HS24020181-01 OF001 WK 3			Lab ID: HN2400179-001			
-------------------------------------	--	--	-----------------------	--	--	--

Analyte	Results	Flag	MDL	MRL	Units	Method
Mercury	3.42		0.200	0.500	ng/L	EPA 1631E

CLIENT ID: HS24020181-02 LL Hg Duplicate			Lab ID: HN2400179-002			
--	--	--	-----------------------	--	--	--

Analyte	Results	Flag	MDL	MRL	Units	Method
Mercury	3.50		0.200	0.500	ng/L	EPA 1631E



Sample Receipt Information

SAMPLE SUMMARY



Client: ALS Environmental
Project: HS24020181
Workorder: HN2400179

Laboratory Sample ID	Client Sample ID	Sample Matrix	Collection Date	Date Received
HN2400179-001	HS24020181-01 OF001 WK 3	WATER	02/05/24 09:00	02/06/24 09:30
HN2400179-002	HS24020181-02 LL Hg Duplicate	WATER	02/05/24 09:00	02/06/24 09:30
HN2400179-003	HS24020181-03 LL Hg Field Blank	WATER	02/05/24 09:00	02/06/24 09:30



10450 Standcliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24635

SUBCONTRACT TO:

ALS Laboratory Group
3352 128th Ave.
Holland, MI 494249263

Phone: +1 616 399 6070

Environmental Division
Holland
Work Order Reference
HN2400179

**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:
Email:**

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Standcliff Rd
Phone: +1 281 530 5656
Reference: HS24020181
TSR: Houston House Acct



Telephone : +1 616 399 6070

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS24020181-01	OF001 WK 3	Water	05 Feb 2024 09:00
	SUB_Available Cyanide			19 Feb 2024
	Sub_MercuryLow			19 Feb 2024
2.	HS24020181-02	LL Hg Duplicate	Water	05 Feb 2024 09:00
	Sub_MercuryLow			19 Feb 2024
3.	HS24020181-03	LL Hg Field Blank	Water	05 Feb 2024 09:00
	Sub_MercuryLow			19 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: _____

Date/Time: _____

Received By: _____

Date/Time: _____

Cooler ID(s): _____

Temperature(s): _____

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Miscellaneous Forms

REPORT QUALIFIERS AND DEFINITIONS

*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Holland Laboratory Certifications

Agency	Type	ID	Issued	Expires
Alabama	Drinking Water (Secondary)	42500	6/27/2023	12/31/2023
Colorado	UST		1/1/2024	6/30/2024
Connecticut	Drinking Water (Secondary)	PH-0155	1/23/2023	12/31/2024
Florida	NELAP (Primary)	E871106	6/28/2023	6/30/2024
Illinois	NELAP (Secondary)	200076	12/14/2023	12/31/2024
Indiana	Drinking Water (Secondary)	C-MI-08	7/6/2021	12/31/2023
Iowa	State Specific	403	9/18/2023	9/1/2025
Kansas	NELAP (Secondary)	E-10411	7/26/2023	7/31/2024
Kentucky	Waste Water	KY98004	12/5/2023	12/31/2024
Kentucky	UST	120474	7/6/2023	6/30/2024
Michigan	Drinking Water (Primary)	0022	12/19/2023	9/4/2026
Minnesota	NELAP (Secondary)	026-999-449	12/29/2023	12/31/2024
New Jersey	NELAP (Secondary)	MI015	6/5/2023	6/30/2024
New York	Drinking Water (Secondary)	12128	4/1/2023	4/1/2024
North Dakota	State Specific	R-192	9/12/2023	6/30/2024
Ohio	Drinking Water (Secondary)	87783	7/5/2023	6/30/2024
Pennsylvania	NELAP (Secondary)	68-03827	12/21/23	7/31/2024
Texas	NELAP (Secondary)	T104704494	2/1/2024	1/31/2025
USDA	Domestic CA	Soil-MI-007	8/21/2023	2/18/2025
USDA	Soil Import	P330-19-00039	3/3/2023	3/3/2026
West Virginia	State Specific	355	8/25/2023	8/31/2024
Wisconsin	State Specific	399084510	8/11/2023	8/31/2024

Holland Aquatic Toxicity Certifications

Agency	Type	ID	Issued	Expires
New Jersey	NELAP (Secondary)	MI013	6/21/2023	6/30/2024
New York	NELAP (Secondary)	12171	4/7/2023	4/1/2024
Pennsylvania	NELAP (Primary)	68-04227	10/27/2023	11/30/2024

ANALYST SUMMARY



Client: ALS Environmental
Project: HS24020181

Work Order: HN2400179

Sample Name: HS24020181-01 OF001 WK 3
Laboratory Code: HN2400179-001
Sample Matrix: WATER

Date Collected: 02/05/24
Date Received: 02/06/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1328343	Amber Luke	2055675	Amber Luke
OIA 1677	1329752	Mike Burkall	2057626	Mike Burkall

Sample Name: HS24020181-02 LL Hg Duplicate
Laboratory Code: HN2400179-002
Sample Matrix: WATER

Date Collected: 02/05/24
Date Received: 02/06/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1328343	Amber Luke	2055675	Amber Luke

Sample Name: HS24020181-03 LL Hg Field Blank
Laboratory Code: HN2400179-003
Sample Matrix: WATER

Date Collected: 02/05/24
Date Received: 02/06/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1328343	Amber Luke	2055675	Amber Luke



Sample Results



Metals

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Sample Name: HS24020181-01 OF001 WK 3
Laboratory Code: HN2400179-001

Work Order: HN2400179
Date Collected: 02/05/24 09:00
Date Received: 02/06/24 09:30

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	3.42	ng/L	0.500	1	02/10/24 16:58	02/09/24 15:30	

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Sample Name: HS24020181-02 LL Hg Duplicate
Laboratory Code: HN2400179-002

Work Order: HN2400179
Date Collected: 02/05/24 09:00
Date Received: 02/06/24 09:30

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	3.50	ng/L	0.500	1	02/10/24 17:22	02/09/24 15:30	

Analytical Report

Client: ALS Environmental

Project: HS24020181/

Sample Matrix: WATER

Work Order: HN2400179

Date Collected: 02/05/24 09:00

Date Received: 02/06/24 09:30

Sample Name: HS24020181-03 LL Hg Field Blank

Laboratory Code: HN2400179-003

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/10/24 17:30	02/09/24 15:30	



General Chemistry

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Sample Name: HS24020181-01 OF001 WK 3
Laboratory Code: HN2400179-001

Work Order: HN2400179
Date Collected: 02/05/24 09:00
Date Received: 02/06/24 09:30

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Available Cyanide	OIA 1677	<2.00 U	µg/L	2.00	1	02/12/24 13:12	02/12/24 13:05	



QC Summary Forms



Metals

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Work Order: HN2400179

Date Collected: NA

Date Received: NA

Sample Name: Method Blank
Laboratory Code: QC-1328343-001

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/10/24 13:51	02/09/24 15:31	

Analytical Report

Client:

ALS Environmental

Project:

HS24020181/

Sample Matrix:

WATER

Sample Name:

Method Blank

Laboratory Code:

QC-1328343-002

Work Order:

HN2400179

Date Collected:

NA

Date Received:

NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/10/24 14:46	02/09/24 15:31	

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1328343-003

Work Order: HN2400179
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/10/24 15:40	02/09/24 15:31	

Analytical Report

Client: ALS Environmental
Project: HS24020181/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1328343-004

Work Order: HN2400179
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/10/24 16:51	02/09/24 15:31	

QA/QC Report

Client: ALS Environmental
Project: HS24020181
Sample Matrix: WATER

Work Order: HN2400179
Date Collected: 02/05/2024
Date Received: 02/06/2024
Date Analyzed: 02/10/2024
Date Extracted: 02/09/2024

Duplicate Matrix Spike Summary
Metals

Sample Name: HS24020181-01 OF001 WK 3
Laboratory Code: HN2400179-001
Analysis Method: EPA 1631E
Prep Method: Method

Units: ng/L
Analysis Lab Lot:2055675

Matrix Spike
QC-1328343-020

Duplicate Matrix Spike
QC-1328343-021

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Mercury	3.42	8.37	5	99.0	8.38	5	99.2	71-125	0.119	24

QA/QC Report

Client: ALS Environmental
Project: HS24020181
Sample Matrix: WATER

Work Order:HN2400179
Date Analyzed:02/10/2024
Date Extracted:02/09/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2055675

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1328343-005	5.27	5	105	77-123

QA/QC Report

Client: ALS Environmental
Project: HS24020181
Sample Matrix: WATER

Work Order:HN2400179
Date Analyzed:02/10/2024
Date Extracted:02/09/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2055675

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1328343-006	5.13	5	103	77-123



General Chemistry

Analytical Report

Client:

ALS Environmental

Project:

HS24020181/

Sample Matrix:

WATER

Sample Name:

Method Blank

Laboratory Code:

QC-1329752-001

Work Order:

HN2400179

Date Collected:

NA

Date Received:

NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Available Cyanide	OIA 1677	<2.00 U	µg/L	2.00	1	02/12/24 13:13	02/12/24 13:06	

QA/QC Report

Client: ALS Environmental
Project: HS24020181
Sample Matrix: WATER

Work Order: HN2400179
Date Collected: 02/05/2024
Date Received: 02/06/2024
Date Analyzed: 02/12/2024
Date Extracted: 02/12/2024

Duplicate Matrix Spike Summary General Chemistry Parameters

Sample Name: HS24020181-01 OF001 WK 3
Laboratory Code: HN2400179-001
Analysis Method: OIA 1677
Prep Method: Method

Units: µg/L
Analysis Lab Lot: 2057626

Matrix Spike
QC-1329752-005

Duplicate Matrix Spike
QC-1329752-006

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Available Cyanide	<2.00 U	59.6	50	118	59.5	50	118	82-130	0.165	11

QA/QC Report

Client: ALS Environmental
Project: HS24020181
Sample Matrix: WATER

Work Order:HN2400179
Date Analyzed:02/12/2024
Date Extracted:02/12/2024

Laboratory Control Sample Summary
Available Cyanide

Analysis Method: OIA 1677
Prep Method: Method

Units:µg/L
Analysis Lab Lot:2057626

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1329752-002	45.5	50	91.1	82-132

Client:

Project:

Work Order:

ChampionX LLC
2024 Permit Renewal-WK3
HS24020181

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24020181-01	OF001 WK 3	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>
HS24020181-02	LL Hg Duplicate	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>
HS24020181-03	LL Hg Field Blank	Water		05-Feb-2024 09:00	05-Feb-2024 14:10	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Sample ID: OF001 WK 3
Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT
WorkOrder:HS24020181
Lab ID:HS24020181-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624				Analyst: TS
1,1,1-Trichloroethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,1,2,2-Tetrachloroethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,1,2-Trichloroethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,1-Dichloroethane	U		0.400	5.00	ug/L	1	06-Feb-2024 16:12
1,1-Dichloroethene	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,2-Dibromoethane	U		0.400	5.00	ug/L	1	06-Feb-2024 16:12
1,2-Dichlorobenzene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
1,2-Dichloroethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,2-Dichloropropane	U		0.700	5.00	ug/L	1	06-Feb-2024 16:12
1,3-Dichlorobenzene	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
1,4-Dichlorobenzene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
2-Butanone	U		1.00	10.0	ug/L	1	06-Feb-2024 16:12
2-Chloroethyl vinyl ether	U		1.30	10.0	ug/L	1	06-Feb-2024 16:12
Acetonitrile	U	n	25.0	50.0	ug/L	1	06-Feb-2024 16:12
Acrolein	U		4.00	20.0	ug/L	1	06-Feb-2024 16:12
Acrylonitrile	U		4.00	10.0	ug/L	1	06-Feb-2024 16:12
Benzene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Benzyl Chloride	U	n	0.500	5.00	ug/L	1	06-Feb-2024 16:12
Bromodichloromethane	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Bromoform	3.65	J	0.500	5.00	ug/L	1	06-Feb-2024 16:12
Bromomethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
Carbon disulfide	U	n	0.900	10.0	ug/L	1	06-Feb-2024 16:12
Carbon tetrachloride	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Chlorobenzene	U		0.400	5.00	ug/L	1	06-Feb-2024 16:12
Chloroethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
Chloroform	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Chloromethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
cis-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Dibromochloromethane	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
Dibromomethane	U	n	0.600	5.00	ug/L	1	06-Feb-2024 16:12
Ethylbenzene	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
Hexachlorobutadiene	U	n	1.00	5.00	ug/L	1	06-Feb-2024 16:12
Methylene chloride	U		1.00	10.0	ug/L	1	06-Feb-2024 16:12
Styrene	U	n	0.500	5.00	ug/L	1	06-Feb-2024 16:12
Tetrachloroethene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Toluene	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
trans-1,2-Dichloroethene	U		0.400	5.00	ug/L	1	06-Feb-2024 16:12
trans-1,3-Dichloropropene	U		0.600	5.00	ug/L	1	06-Feb-2024 16:12
Trichloroethene	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK3
Sample ID: OF001 WK 3
Collection Date: 05-Feb-2024 09:00

ANALYTICAL REPORT

WorkOrder:HS24020181
Lab ID:HS24020181-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624			Analyst: TS	
Vinyl chloride	U		0.400	2.00	ug/L	1	06-Feb-2024 16:12
Xylenes, Total	U		0.500	5.00	ug/L	1	06-Feb-2024 16:12
Total Trihalomethanes (TTHMs)	3.65	Ja	0.500	5.00	ug/L	1	06-Feb-2024 16:12
Surr: 1,2-Dichloroethane-d4	86.0			70-126	%REC	1	06-Feb-2024 16:12
Surr: 4-Bromofluorobenzene	96.0			82-124	%REC	1	06-Feb-2024 16:12
Surr: Dibromofluoromethane	85.6			77-123	%REC	1	06-Feb-2024 16:12
Surr: Toluene-d8	96.9			82-127	%REC	1	06-Feb-2024 16:12
VOLATILES - SW8260C			Method:SW8260			Analyst: TS	
Acetaldehyde	U	n	10	10	ug/L	1	06-Feb-2024 16:12
Propylene oxide	U	n	10	10	ug/L	1	06-Feb-2024 16:12
Surr: 1,2-Dichloroethane-d4	86.0			70-126	%REC	1	06-Feb-2024 16:12
Surr: 4-Bromofluorobenzene	96.0			82-124	%REC	1	06-Feb-2024 16:12
Surr: Dibromofluoromethane	85.6			77-123	%REC	1	06-Feb-2024 16:12
Surr: Toluene-d8	96.9			82-127	%REC	1	06-Feb-2024 16:12
TOTAL METALS BY E200.8, REV 5.4, 1994			Method:E200.8			Prep:E200.8 / 06-Feb-2024	
Aluminum	249		0.800	10.0	ug/L	1	06-Feb-2024 23:37
Antimony	U		0.530	5.00	ug/L	1	06-Feb-2024 23:37
Arsenic	0.861	J	0.250	2.00	ug/L	1	06-Feb-2024 23:37
Barium	28.5		0.0840	4.00	ug/L	1	06-Feb-2024 23:37
Beryllium	U		0.0910	5.00	ug/L	1	06-Feb-2024 23:37
Boron	51.4		16.7	20.0	ug/L	1	06-Feb-2024 23:37
Cadmium	U		0.0770	2.00	ug/L	1	06-Feb-2024 23:37
Chromium	0.871	J	0.251	4.00	ug/L	1	06-Feb-2024 23:37
Cobalt	0.266	J	0.0400	5.00	ug/L	1	06-Feb-2024 23:37
Copper	4.43		0.170	2.00	ug/L	1	06-Feb-2024 23:37
Iron	311		50.0	200	ug/L	1	06-Feb-2024 23:37
Lead	26.8		0.120	2.00	ug/L	1	06-Feb-2024 23:37
Magnesium	3,820		7.80	500	ug/L	1	06-Feb-2024 23:37
Manganese	10.1		0.0660	5.00	ug/L	1	06-Feb-2024 23:37
Molybdenum	14.4		0.490	5.00	ug/L	1	06-Feb-2024 23:37
Nickel	2.01		0.110	2.00	ug/L	1	06-Feb-2024 23:37
Selenium	U		0.860	2.00	ug/L	1	06-Feb-2024 23:37
Silver	0.101	J	0.0440	2.00	ug/L	1	06-Feb-2024 23:37
Thallium	U		0.250	2.00	ug/L	1	06-Feb-2024 23:37
Tin	0.253	J	0.0580	5.00	ug/L	1	06-Feb-2024 23:37
Titanium	5.41		0.390	5.00	ug/L	1	06-Feb-2024 23:37
Zinc	41.1		1.00	4.00	ug/L	1	06-Feb-2024 23:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK3	WorkOrder:HS24020181
Sample ID:	OF001 WK 3	Lab ID:HS24020181-01
Collection Date:	05-Feb-2024 09:00	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY E300.0, REV 2.1, 1993		Method:E300		Analyst: TH			
Bromide	0.855		0.0300	0.100	mg/L	1	06-Feb-2024 12:31
Chloride	29.9		0.200	0.500	mg/L	1	06-Feb-2024 12:31
Fluoride	0.0982	J	0.0500	0.100	mg/L	1	06-Feb-2024 12:31
Nitrogen, Nitrate (As N)	0.178		0.0300	0.100	mg/L	1	06-Feb-2024 12:31
Sulfate	15.6		0.200	0.500	mg/L	1	06-Feb-2024 12:31
NITRATE/NITRITE BY E300.0, REV 2.1, 1993		Method:E300		Analyst: TH			
Nitrate/Nitrite (as N)	0.154	J	0.150	1.00	mg/L	5	09-Feb-2024 07:30
COLOR BY SM 2120B - 2011		Method:SM2120B		Analyst: JAC			
Color, Apparent	55.0		5.00	5.00	Color Units	1	05-Feb-2024 16:35
SULFIDE BY SM4500 S2-F-2011		Method:SM4500 S2-F		Analyst: CD			
Sulfide	U		1.70	2.00	mg/L	1	10-Feb-2024 13:00
SURFACTANTS (MBAS) BY SM5540C		Method:SM5540C		Prep:SM5540C / 06-Feb-2024		Analyst: MZD	
MBAS	0.0800		0.00800	0.0500	mg/L 340 MW LAS	1	07-Feb-2024 08:49
SUBCONTRACT HEXAVALENT CHROMIUM		Method:E218.6		Analyst: SUB			
Chromium, Hexavalent	See Attached		0		UG/L	1	13-Feb-2024 20:16
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA		Analyst: SUB			
Subcontract Analysis	See Attached		0			1	09-Feb-2024 14:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

HS24020181

ChampionX LLC

2024 Permit Renewal-WK3

Chain of Custody Form

Page ____ of ____

CQC ID: 312465

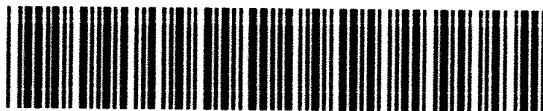
Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700

South ... WV

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SHORT
HOLDING
TIME

ALS Project Manager:		ALS Work Order #:																		
Project Information				Parameter/Method Request for Analysis																
Purchase Order	450443658	Project Name	2024 Permit Renewal	A	PCB 608, SVOC 625, VOC 624/8260_W															
Work Order		Project Number		B	200.8 (Metals), 8015 (Amines)															
Company Name	Nalco Company	Bill To Company	ChampionX LLC	C	BOD, CBOD, 300_W(NO3,SO4,Cl,F, Br), pH/Color															
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380	D	COD, TOC, TON (Ammonia, TKN), CN_TW															
Address	PO Box 2167	Address	PO Box 2167	E	O&G, Total Phosphorus, Sulfide, Surfactants															
				F	TSS, TDS, ALK, Cr3_W, DO, Sulfite, Res Chlorine															
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542	G	Sub E.Coli and Enterococci to Envirodyne															
Phone	(979) 239-5800	Phone	(979) 239-5800	H	Available Cyanide (Sub to Holland, MI)															
Fax	(979) 233-6767	Fax	(979) 233-6767	I	Low level Mercury (Sub to Holland, MI)															
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com	J	Low Level HexChrome (Sub to ESC)/Sub Formaldehyde A&B															

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF001 WK3	2/5/24		W		7	X										
2	OF001 WK3	2/5/24		W		1		X									
3	OF001 WK3	2/5/24		W		4			X								
4	OF001 WK3	2/5/24		W		4				X							
5	OF001 WK3	2/5/24		W		4					X						
6	OF001 WK3	2/5/24		W		6						X					
7	OF001 WK3	2/5/24	0900	W		4							X				
8	OF001 WK3	2/5/24		W		1								X			
9	OF001 WK3	2/5/24		W		13									X		
10	OF001 WK3	2/5/24		W		3										X	

Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:	
Marcy Putnam		P/U ALS		<input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hr					
Relinquished by:	Date:	Time:	Received by:	Notes: Annual Permit Renewal					
D. J.	2-5-24	1155	D. J.						
Relinquished by:	Date:	Time:	Received by (Laboratory):						
D. J.	2-5-24	1410	D. J.						
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):						
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035									

Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)	
Blue	4°C	<input checked="" type="checkbox"/> Level II Std QC	<input type="checkbox"/> TRRP Checklist
Blue	1-1	<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV
		<input type="checkbox"/> Level IV SW846/CLP	
		Other	

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 04, 2024

Andy Slater
ChampionX LLC
PO Box 2167
Freeport, TX 77542

Work Order: **HS24020649**

Laboratory Results for: **2024 Permit Renewal-WK4**

Dear Andy Slater,

ALS Environmental received 3 sample(s) on Feb 12, 2024 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Andy C. Neir

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
Work Order: HS24020649

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24020649-01	OF001 WK 4	Water		12-Feb-2024 07:05	12-Feb-2024 13:05	<input type="checkbox"/>
HS24020649-02	LL Hg Duplicate	Water		12-Feb-2024 07:05	12-Feb-2024 13:05	<input type="checkbox"/>
HS24020649-03	LL Hg Field Blank	Water		12-Feb-2024 07:05	12-Feb-2024 13:05	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
Work Order: HS24020649

CASE NARRATIVE**Work Order Comments**

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.
Chlorine, Dissolved, Oxygen and Sulfite are immediate tests. Sample results are flagged with an "H" qualifier.
- The analyses for Mercury and Cyanide, Available were subcontracted to ALS Environmental in Holland, MI. Final report attached.
The analysis for Formaldehyde was subcontracted to A&B Lab Laboratories, Inc. in Houston, TX. Final report attached.
The analysis for Hexavalent Chromium was subcontracted to Pace Analytical in Lancaster, PA . Final report attached
The analysis for Amines was subcontracted to SPL I in the Woodlands TX . Final report attached

ECD Organics by Method E608**Batch ID: 207578****Sample ID: LCS-207578**

- The multi-response compounds toxaphene and chlordane were not included in the spiking solution for the LCS/LCSD

Sample ID: MBLK-207578

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.
- CCV %D was above the control limits. The associated sample results are non detect. alpha-BHC, gamma-BHC and delta-BHC in the closing ccv only
Sample ID: OF001 WK 4 (HS24020649-01)
• One or more surrogate recoveries were above the upper control limits. No target analytes were detected in the sample. The high surrogate recoveries did not impact the non-detect results for target analytes. DCB

Batch ID: 207578 (1)**Sample ID: MBLK-207578 (PCBs)**

- Insufficient sample received to perform MS/MSD. LCS/LCSD provided as batch quality control.

GCMS Semivolatiles by Method E625**Batch ID: 207461****Sample ID: LCSD1-207461**

- The RPD between the LCS and LCSD was outside of the control limit.

GCMS Volatiles by Method E624**Batch ID: R458686****Sample ID: HS24020319-23MS**

- MS and MSD are for an unrelated sample

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
Work Order: HS24020649

CASE NARRATIVE

GCMS Volatiles by Method E624**Batch ID: R458638****Sample ID: VLCSW-240213**

- Insufficient sample received to perform MS/MSD. An LCS/LCSD was performed as batch quality control.

Metals by Method E200.8**Batch ID: 207370****Sample ID: HS24020710-06MSD**

- MSD is for an unrelated sample

WetChemistry by Method M4500-O G**Batch ID: R458649**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2120B**Batch ID: R458693**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500SO3B**Batch ID: R459065**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540D**Batch ID: R459228**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540C**Batch ID: R459281**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4**Batch ID: R459453**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B**Batch ID: R459651**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
Work Order: HS24020649

CASE NARRATIVE

WetChemistry by Method E1664A**Batch ID: R459380**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500H+ B**Batch ID: R459280**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B**Batch ID: R459140**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 S2-F**Batch ID: R458922**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500CL F**Batch ID: R458652**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E300**Batch ID: R458574****Sample ID: HS24020570-01MS**

- MS and MSD are for an unrelated sample (Sulfate)

Batch ID: R459335

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500CN EG**Batch ID: 207745**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 NH3-B-F**Batch ID: 207887**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M4500 NH3 D**Batch ID: 207804,R459737**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
Work Order: HS24020649

CASE NARRATIVE

WetChemistry by Method SM5540C

Batch ID: 207498

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5210 B

Batch ID: 207288,207293

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES			Method:E624			Analyst: AKP	
1,1,1-Trichloroethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,1,2,2-Tetrachloroethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,1,2-Trichloroethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,1-Dichloroethane	U		0.000400	0.00500	mg/L	1	13-Feb-2024 12:06
1,1-Dichloroethene	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,2-Dibromoethane	U		0.000400	0.00500	mg/L	1	13-Feb-2024 12:06
1,2-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
1,2-Dichloroethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,2-Dichloropropane	U		0.000700	0.00500	mg/L	1	13-Feb-2024 12:06
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
1,4-Dichlorobenzene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
2-Butanone	U		0.00100	0.0100	mg/L	1	13-Feb-2024 12:06
2-Chloroethyl vinyl ether	U		0.00130	0.0100	mg/L	1	13-Feb-2024 12:06
Acetonitrile	U	n	0.0250	0.0500	mg/L	1	13-Feb-2024 12:06
Acrolein	U		0.00400	0.0200	mg/L	1	13-Feb-2024 12:06
Acrylonitrile	U		0.00400	0.0100	mg/L	1	13-Feb-2024 12:06
Benzene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Benzyl Chloride	U	n	0.000500	0.00500	mg/L	1	13-Feb-2024 17:23
Bromodichloromethane	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Bromoform	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Bromomethane	0.00766		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Carbon disulfide	U	n	0.000900	0.0100	mg/L	1	13-Feb-2024 12:06
Carbon tetrachloride	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Chlorobenzene	U		0.000400	0.00500	mg/L	1	13-Feb-2024 12:06
Chloroethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Chloroform	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Chloromethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
cis-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Dibromochloromethane	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Dibromomethane	U	n	0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Ethylbenzene	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Hexachlorobutadiene	U	n	0.00100	0.00500	mg/L	1	13-Feb-2024 12:06
Methylene chloride	U		0.00100	0.0100	mg/L	1	13-Feb-2024 12:06
Styrene	U	n	0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Tetrachloroethene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Toluene	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
trans-1,2-Dichloroethene	U		0.000400	0.00500	mg/L	1	13-Feb-2024 12:06
trans-1,3-Dichloropropene	U		0.000600	0.00500	mg/L	1	13-Feb-2024 12:06
Trichloroethene	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK4	WorkOrder:HS24020649
Sample ID:	OF001 WK 4	Lab ID:HS24020649-01
Collection Date:	12-Feb-2024 07:05	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES	Method:E624						Analyst: AKP
Vinyl chloride	U		0.000400	0.00200	mg/L	1	13-Feb-2024 12:06
Xylenes, Total	U		0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Total Trihalomethanes (TTHMs)	U	a	0.000500	0.00500	mg/L	1	13-Feb-2024 12:06
Surr: 1,2-Dichloroethane-d4	113			70-126	%REC	1	13-Feb-2024 17:23
Surr: 1,2-Dichloroethane-d4	113			70-126	%REC	1	13-Feb-2024 12:06
Surr: 4-Bromofluorobenzene	96.9			82-124	%REC	1	13-Feb-2024 17:23
Surr: 4-Bromofluorobenzene	95.4			82-124	%REC	1	13-Feb-2024 12:06
Surr: Dibromofluoromethane	119			77-123	%REC	1	13-Feb-2024 17:23
Surr: Dibromofluoromethane	98.0			77-123	%REC	1	13-Feb-2024 12:06
Surr: Toluene-d8	97.3			82-127	%REC	1	13-Feb-2024 17:23
Surr: Toluene-d8	101			82-127	%REC	1	13-Feb-2024 12:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 16-Feb-2024		Analyst: GEY	
1,2,4,5-Tetrachlorobenzene	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
1,2,4-Trichlorobenzene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
1,2-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
1,2-Diphenylhydrazine	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
1,3-Dichlorobenzene	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
1,4-Dichlorobenzene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
2,4,5-Trichlorophenol	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
2,4,6-Trichlorophenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
2,4-Dichlorophenol	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
2,4-Dimethylphenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
2,4-Dinitrophenol	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
2,4-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
2,6-Dichlorophenol	U	n	0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
2,6-Dinitrotoluene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
2-Chloronaphthalene	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
2-Chlorophenol	U		0.00100	0.00500	mg/L	1	16-Feb-2024 21:43
2-Methylphenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
2-Nitrophenol	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
3&4-Methylphenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
3,3'-Dichlorobenzidine	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
4,6-Dinitro-2-methylphenol	U		0.000900	0.00500	mg/L	1	16-Feb-2024 21:43
4-Bromophenyl phenyl ether	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
4-Chloro-3-methylphenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
4-Chlorophenyl phenyl ether	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
4-Nitrophenol	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
Acenaphthene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Acenaphthylene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Anthracene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Benz(a)anthracene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Benzidine	U		0.00500	0.00500	mg/L	1	16-Feb-2024 21:43
Benzo(a)pyrene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Benzo(b)fluoranthene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Benzo(g,h,i)perylene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Benzo(k)fluoranthene	U		0.000700	0.00500	mg/L	1	16-Feb-2024 21:43
Bis(2-chloroethoxy)methane	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Bis(2-chloroethyl)ether	U		0.000700	0.00500	mg/L	1	16-Feb-2024 21:43
Bis(2-chloroisopropyl)ether	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Bis(2-ethylhexyl)phthalate	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Butyl benzyl phthalate	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILE		Method:E625		Prep:E625 / 16-Feb-2024		Analyst: GEY	
Chrysene	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Dibenz(a,h)anthracene	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
Diethyl phthalate	U		0.000700	0.00500	mg/L	1	16-Feb-2024 21:43
Dimethyl phthalate	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
Di-n-butyl phthalate	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Di-n-octyl phthalate	U		0.00200	0.00500	mg/L	1	16-Feb-2024 21:43
Fluoranthene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Fluorene	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
Hexachlorobenzene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Hexachlorobutadiene	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
Hexachlorocyclopentadiene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Hexachloroethane	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
Isophorone	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
Naphthalene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Nitrobenzene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
N-Nitrosodiethylamine	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
N-Nitrosodimethylamine	U		0.000600	0.00500	mg/L	1	16-Feb-2024 21:43
N-Nitroso-di-n-butylamine	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
N-Nitrosodi-n-propylamine	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
N-Nitrosodiphenylamine	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Nonylphenol	U	n	0.00500	0.00500	mg/L	1	16-Feb-2024 21:43
Pentachlorobenzene	U		0.000500	0.00500	mg/L	1	16-Feb-2024 21:43
Pentachlorophenol	U		0.000800	0.00500	mg/L	1	16-Feb-2024 21:43
Phenanthrene	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Phenol	U		0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Pyrene	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Pyridine	U		0.000300	0.00500	mg/L	1	16-Feb-2024 21:43
Cresols, Total	U	n	0.000400	0.00500	mg/L	1	16-Feb-2024 21:43
Surr: 2,4,6-Tribromophenol	66.1			42-124	%REC	1	16-Feb-2024 21:43
Surr: 2-Fluorobiphenyl	59.7			48-120	%REC	1	16-Feb-2024 21:43
Surr: 2-Fluorophenol	57.1			20-120	%REC	1	16-Feb-2024 21:43
Surr: 4-Terphenyl-d14	76.1			51-135	%REC	1	16-Feb-2024 21:43
Surr: Nitrobenzene-d5	60.2			41-120	%REC	1	16-Feb-2024 21:43
Surr: Phenol-d6	77.5			20-120	%REC	1	16-Feb-2024 21:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
CHLORINATED PEST/PCBS BY E608		Method:E608		Prep:E608 / 19-Feb-2024		Analyst: DLB	
4,4'-DDD	U		0.0000760	0.00250	UG/L	1	22-Feb-2024 04:07
4,4'-DDE	U		0.000100	0.00250	UG/L	1	22-Feb-2024 04:07
4,4'-DDT	U		0.000145	0.00250	UG/L	1	22-Feb-2024 04:07
Aldrin	U		0.0000340	0.00125	UG/L	1	22-Feb-2024 04:07
alpha-BHC	U		0.00125	0.00125	UG/L	1	22-Feb-2024 04:07
Aroclor 1016	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1221	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1232	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1242	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1248	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1254	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Aroclor 1260	U		0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
beta-BHC	U		0.0000430	0.00125	UG/L	1	22-Feb-2024 04:07
Chlordane	U		0.0250	0.0250	UG/L	1	22-Feb-2024 04:07
delta-BHC	U		0.0000290	0.00125	UG/L	1	22-Feb-2024 04:07
Dieldrin	U		0.0000530	0.00250	UG/L	1	22-Feb-2024 04:07
Endosulfan I	U		0.0000390	0.00125	UG/L	1	22-Feb-2024 04:07
Endosulfan II	U		0.00250	0.00250	UG/L	1	22-Feb-2024 04:07
Endosulfan sulfate	U		0.0000930	0.00250	UG/L	1	22-Feb-2024 04:07
Endrin	U		0.0000830	0.00250	UG/L	1	22-Feb-2024 04:07
Endrin aldehyde	U		0.000147	0.00250	UG/L	1	22-Feb-2024 04:07
gamma-BHC	U		0.00125	0.00125	UG/L	1	22-Feb-2024 04:07
Heptachlor	U		0.0000450	0.00125	UG/L	1	22-Feb-2024 04:07
Heptachlor epoxide	U		0.0000270	0.00125	UG/L	1	22-Feb-2024 04:07
Toxaphene	U		0.0250	0.0250	UG/L	1	22-Feb-2024 04:07
Total PCBs	U	n	0.0125	0.0125	UG/L	1	20-Feb-2024 19:38
Surr: Decachlorobiphenyl	219	S		61-154	%REC	1	20-Feb-2024 19:38
Surr: Decachlorobiphenyl	164	S		61-154	%REC	1	22-Feb-2024 04:07
Surr: Tetrachloro-m-xylene	105			60-144	%REC	1	22-Feb-2024 04:07
Surr: Tetrachloro-m-xylene	97.4			60-144	%REC	1	20-Feb-2024 19:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 14-Feb-2024		Analyst: JC	
Aluminum	0.0463		0.000800	0.0100	mg/L	1	21-Feb-2024 19:51
Antimony	0.000756	J	0.000530	0.00500	mg/L	1	21-Feb-2024 19:51
Arsenic	0.000449	J	0.000250	0.00200	mg/L	1	21-Feb-2024 19:51
Barium	0.0574		0.0000840	0.00400	mg/L	1	21-Feb-2024 19:51
Beryllium	U		0.0000910	0.00500	mg/L	1	21-Feb-2024 19:51
Boron	0.0313		0.0167	0.0200	mg/L	1	21-Feb-2024 19:51
Cadmium	0.0000800	J	0.0000770	0.00200	mg/L	1	21-Feb-2024 19:51
Chromium	0.000654	J	0.000251	0.00400	mg/L	1	21-Feb-2024 19:51
Cobalt	0.000130	J	0.0000400	0.00500	mg/L	1	21-Feb-2024 19:51
Copper	0.00282		0.000170	0.00200	mg/L	1	21-Feb-2024 19:51
Iron	0.457		0.0500	0.200	mg/L	1	21-Feb-2024 19:51
Lead	0.000581	J	0.000120	0.00200	mg/L	1	21-Feb-2024 19:51
Magnesium	4.13		0.00780	0.500	mg/L	1	21-Feb-2024 19:51
Manganese	0.0249		0.0000660	0.00500	mg/L	1	21-Feb-2024 19:51
Molybdenum	0.0326		0.000490	0.00500	mg/L	1	21-Feb-2024 19:51
Nickel	0.00128	J	0.000110	0.00200	mg/L	1	21-Feb-2024 19:51
Selenium	U		0.000860	0.00200	mg/L	1	21-Feb-2024 19:51
Silver	U		0.0000440	0.00200	mg/L	1	21-Feb-2024 19:51
Thallium	U		0.000250	0.00200	mg/L	1	21-Feb-2024 19:51
Tin	0.000105	J	0.0000580	0.00500	mg/L	1	21-Feb-2024 19:51
Titanium	0.000650	J	0.000390	0.00500	mg/L	1	21-Feb-2024 19:51
Zinc	0.0305		0.00100	0.00400	mg/L	1	21-Feb-2024 19:51
OIL & GREASE (HEM) BY E1664A		Method:E1664A				Analyst: MC	
Oil and Grease	1.86	J	0.610	2.00	mg/L	1	21-Feb-2024 07:00
ANIONS BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Bromide	2.18		0.0300	0.100	mg/L	1	12-Feb-2024 17:48
Chloride	50.9		0.200	0.500	mg/L	1	12-Feb-2024 17:48
Fluoride	4.12		0.0500	0.100	mg/L	1	12-Feb-2024 17:48
Nitrogen, Nitrate (As N)	1.10		0.0300	0.100	mg/L	1	12-Feb-2024 17:48
Sulfate	33.4		0.200	0.500	mg/L	1	12-Feb-2024 17:48
NITRATE/NITRITE BY E300.0, REV 2.1, 1993		Method:E300				Analyst: TH	
Nitrate/Nitrite (as N)	11.4		0.150	1.00	mg/L	5	21-Feb-2024 00:58
CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993		Method:E410.4				Analyst: TH	
Chemical Oxygen Demand	118		5.00	15.0	mg/L	1	21-Feb-2024 16:00
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		Method:M2540C				Analyst: MZD	
Total Dissolved Solids (Residue, Filterable)	302		5.00	10.0	mg/L	1	19-Feb-2024 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ChampionX LLC
 Project: 2024 Permit Renewal-WK4
 Sample ID: OF001 WK 4
 Collection Date: 12-Feb-2024 07:05

ANALYTICAL REPORT

WorkOrder:HS24020649
 Lab ID:HS24020649-01
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL SUSPENDED SOLIDS BY SM 2540D-2011 Method:M2540D							Analyst: JAC
Suspended Solids (Residue, Non-Filterable)	9.40		2.00	2.00	mg/L	1	17-Feb-2024 11:00
ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011 Method:M4500 NH3 D							Analyst: MZD
Nitrogen, Organic	U		0.50	0.50	mg/L	1	23-Feb-2024 17:35
TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011 Method:M4500 NH3 D							Prep:M4500-N C / 22-Feb-2024 Analyst: MM
Nitrogen, Total Kjeldahl	71		0.10	0.50	mg/L	1	22-Feb-2024 10:12
CYANIDE BY SM 4500CN E&G-2011 Method:M4500CN EG							Prep:M4500CN E&G / 21-Feb-2024 Analyst: MZD
Cyanide	U		0.00200	0.00500	mg/L	1	21-Feb-2024 15:37
DISSOLVED OXYGEN BY SM4500-O G Method:M4500-O G							Analyst: JAC
Oxygen, Dissolved	9.16	H	1.00	1.00	mg/L	1	13-Feb-2024 13:30
COLOR BY SM 2120B - 2011 Method:SM2120B							Analyst: JAC
Color, Apparent	25.0		5.00	5.00	Color Units	1	13-Feb-2024 19:20
ALKALINITY BY -2011 Method:SM2320B							Analyst: JAC
Alkalinity, Total (As CaCO3)	369		2.50	5.00	mg/L	1	22-Feb-2024 20:29
AMMONIA AS N BY SM4500 NH3-B-F-2011 Method:SM4500 NH3-B-F							Prep:M4500-NH3 B / 23-Feb-2024 Analyst: MZD
Nitrogen, Ammonia (as N)	71		6.2	12	mg/L	5	23-Feb-2024 15:44
SULFIDE BY SM4500 S2-F-2011 Method:SM4500 S2-F							Analyst: CD
Sulfide	U		1.70	2.00	mg/L	1	15-Feb-2024 14:13
RESIDUAL CHLORINE BY SM4500CL F-2011 Method:SM4500CL F							Analyst: MC
Chlorine	0.10	H	0.10	0.10	mg/L	1	13-Feb-2024 14:20
PH BY SM4500H+ B-2011 Method:SM4500H+ B							Analyst: MR
pH	7.99	H	0.100	0.100	pH Units	1	20-Feb-2024 12:36
Temp Deg C @pH	20.0	H	0	0	°C	1	20-Feb-2024 12:36
SULFITE BY SM4500SO3B Method:SM4500SO3B							Analyst: MC
Sulfite	U	H	5.00	5.00	mg/L	1	16-Feb-2024 13:40
BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 13-Feb-2024 Analyst: JAC
Biochemical Oxygen Demand	2.73		2.00	2.00	mg/L	1	18-Feb-2024 15:51
CBOD BY SM5210B-2011 Method:SM5210 B							Prep:SM5210 B / 13-Feb-2024 Analyst: JAC
Carbonaceous Biochemical Oxygen Demand	2.20		2.00	2.00	mg/L	1	18-Feb-2024 15:42
TOTAL ORGANIC CARBON - SM5310B-2011 Method:SM5310B							Analyst: DW
Organic Carbon, Total	25.6		0.500	1.00	mg/L	1	17-Feb-2024 06:24
SURFACTANTS (MBAS) BY SM5540C Method:SM5540C							Prep:SM5540C / 12-Feb-2024 Analyst: MZD
MBAS	0.0160	J	0.00800	0.0500	mg/L 340 MW LAS	1	12-Feb-2024 16:10
SUBCONTRACT HEXAVALENT CHROMIUM Method:E218.6							Analyst: SUB
Chromium, Hexavalent	See Attached		0		UG/L	1	14-Feb-2024 17:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK4	WorkOrder:HS24020649
Sample ID:	OF001 WK 4	Lab ID:HS24020649-01
Collection Date:	12-Feb-2024 07:05	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - AMINES		Method:NA		Analyst: SPL			
Subcontract Analysis	0		0	0	NA	1	21-Feb-2024 18:15
SUB ANALYSIS AVAILABLE CYANIDE - EPA OIA-1667		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	22-Feb-2024 09:39
SUBCONTRACT ANALYSIS - E. COLI		Method:NA		Analyst: EDL			
Subcontract Analysis	See Attached		0			1	29-Feb-2024 16:49
SUBCONTRACT ANALYSIS - ENTEROCOCCI		Method:NA		Analyst: EDL			
Subcontract Analysis	See Attached		0			1	29-Feb-2024 16:49
SUBCONTRACT ANALYSIS - FORMALDEHYDE		Method:NA		Analyst: SUB			
Subcontract Analysis	0		0	0		1	20-Feb-2024 11:06
SUBCONTRACT ANALYSIS - MERCURY LOW		Method:NA		Analyst: SUBHO			
Subcontract Analysis	See Attached		0		NA	1	22-Feb-2024 09:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK4	WorkOrder:HS24020649
Sample ID:	LL Hg Duplicate	Lab ID:HS24020649-02
Collection Date:	12-Feb-2024 07:05	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	22-Feb-2024 09:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal-WK4	WorkOrder:HS24020649
Sample ID:	LL Hg Field Blank	Lab ID:HS24020649-03
Collection Date:	12-Feb-2024 07:05	Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - MERCURY		Method:NA					Analyst:
LOW							SUBHO
Subcontract Analysis	See Attached		0		NA	1	22-Feb-2024 09:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

Batch ID: 207288	Start Date: 13 Feb 2024 13:00	End Date: 13 Feb 2024 13:00
Method: WETCHEMPREP, BOD		Prep Code: BOD_PR 5210B

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 207293	Start Date: 13 Feb 2024 14:00	End Date: 13 Feb 2024 14:00
Method: CBOD PREP		Prep Code: CBOD_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		300 (mL)	300 (mL)	1	1-L plastic, Neat

Batch ID: 207370	Start Date: 14 Feb 2024 13:00	End Date: 14 Feb 2024 13:00
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994		Prep Code: 200.8PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 207461	Start Date: 16 Feb 2024 09:07	End Date: 16 Feb 2024 09:07
Method: 625 AQ SEP FUNNEL EXTRACTION		Prep Code: 625PRF

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Sodium thiosulfate

Batch ID: 207498	Start Date: 12 Feb 2024 14:00	End Date: 12 Feb 2024 14:00
Method: MBAS - PREPARATION		Prep Code: MBAS_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		400 (mL)	400 (mL)	1	1-L plastic, Neat

Batch ID: 207578	Start Date: 19 Feb 2024 13:03	End Date: 19 Feb 2024 13:03
Method: AQPREP SEP FUNNEL: PEST/PCB		Prep Code: 608_W_LOWPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01	1	1000 (mL)	1 (mL)	0.001	1-liter amber glass, Neat

Batch ID: 207745	Start Date: 21 Feb 2024 12:00	End Date: 21 Feb 2024 12:00
Method: CYANIDE PREP - SM4500CN-2011		Prep Code: CN_TW4500_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		50 (mL)	50 (mL)	1	250 mL plastic, NaOH/ASE

Batch ID: 207804	Start Date: 22 Feb 2024 10:12	End Date: 22 Feb 2024 10:12
Method: TKN WATER - PREP		Prep Code: TKN_W_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		25 (mL)	50 (mL)	2	1-liter amber glass, H2SO4 to pH <2

Weight / Prep Log

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

Batch ID: 207887	Start Date: 23 Feb 2024 10:30	End Date: 23 Feb 2024 10:30
Method: NITROGEN AMMONIA - WATER - PREP		Prep Code: NIT_AMM_W_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24020649-01		0.5 (mL)	25 (mL)	50	1-liter amber glass, H2SO4 to pH <2

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 207288 (0)		Test Name : BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		13 Feb 2024 13:00	18 Feb 2024 15:51	1
Batch ID: 207293 (0)		Test Name : CBOD BY SM5210B-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		13 Feb 2024 14:00	18 Feb 2024 15:42	1
Batch ID: 207370 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		14 Feb 2024 13:00	21 Feb 2024 19:51	1
Batch ID: 207461 (0)		Test Name : SEMIVOLATILE			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		16 Feb 2024 09:07	16 Feb 2024 21:43	1
Batch ID: 207498 (0)		Test Name : SURFACTANTS (MBAS) BY SM5540C			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		12 Feb 2024 14:00	12 Feb 2024 16:10	1
Batch ID: 207578 (0)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		19 Feb 2024 13:03	22 Feb 2024 04:07	1
Batch ID: 207578 (1)		Test Name : CHLORINATED PEST/PCBS BY E608			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		19 Feb 2024 13:03	20 Feb 2024 19:38	1
Batch ID: 207745 (0)		Test Name : CYANIDE BY SM 4500CN E&G-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		21 Feb 2024 12:00	21 Feb 2024 15:37	1
Batch ID: 207804 (0)		Test Name : TOTAL KJELDAHL NITROGEN BY SM4500 NH3 D-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		22 Feb 2024 10:12	22 Feb 2024 10:12	1
Batch ID: 207887 (0)		Test Name : AMMONIA AS N BY SM4500 NH3-B-F-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05		23 Feb 2024 10:30	23 Feb 2024 15:44	5
Batch ID: R458574 (0)		Test Name : ANIONS BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			12 Feb 2024 17:48	1
Batch ID: R458638 (0)		Test Name : VOLATILES			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			13 Feb 2024 17:23	1
Batch ID: R458649 (0)		Test Name : DISSOLVED OXYGEN BY SM4500-O G			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			13 Feb 2024 13:30	1
Batch ID: R458652 (0)		Test Name : RESIDUAL CHLORINE BY SM4500CL F-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			13 Feb 2024 14:20	1
Batch ID: R458686 (0)		Test Name : VOLATILES			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			13 Feb 2024 12:06	1
Batch ID: R458693 (0)		Test Name : COLOR BY SM 2120B - 2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			13 Feb 2024 19:20	1
Batch ID: R458922 (0)		Test Name : SULFIDE BY SM4500 S2-F-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			15 Feb 2024 14:13	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R458998 (0)		Test Name : SUBCONTRACT HEXAVALENT CHROMIUM			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			14 Feb 2024 17:47	1
Batch ID: R459065 (0)		Test Name : SULFITE BY SM4500SO3B			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			16 Feb 2024 13:40	1
Batch ID: R459140 (0)		Test Name : TOTAL ORGANIC CARBON - SM5310B-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			17 Feb 2024 06:24	1
Batch ID: R459228 (0)		Test Name : TOTAL SUSPENDED SOLIDS BY SM 2540D-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			17 Feb 2024 11:00	1
Batch ID: R459247 (0)		Test Name : SUBCONTRACT ANALYSIS - FORMALDEHYDE			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			20 Feb 2024 11:06	1
Batch ID: R459280 (0)		Test Name : PH BY SM4500H+ B-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			20 Feb 2024 12:36	1
Batch ID: R459281 (0)		Test Name : TOTAL DISSOLVED SOLIDS BY SM2540C-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			19 Feb 2024 13:35	1
Batch ID: R459335 (0)		Test Name : NITRATE/NITRITE BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			21 Feb 2024 00:58	5
Batch ID: R459380 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			21 Feb 2024 07:00	1
Batch ID: R459453 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			21 Feb 2024 16:00	1
Batch ID: R459463 (0)		Test Name : SUBCONTRACT ANALYSIS - AMINES			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			21 Feb 2024 18:15	1
Batch ID: R459512 (0)		Test Name : SUBCONTRACT ANALYSIS - MERCURY LOW			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			22 Feb 2024 09:39	1
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			22 Feb 2024 09:39	1
HS24020649-02	LL Hg Duplicate	12 Feb 2024 07:05			22 Feb 2024 09:39	1
HS24020649-03	LL Hg Field Blank	12 Feb 2024 07:05			22 Feb 2024 09:39	1
Batch ID: R459651 (0)		Test Name : ALKALINITY BY -2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			22 Feb 2024 20:29	1
Batch ID: R459737 (0)		Test Name : ORGANIC NITROGEN BY SM4500-NH3D MINUS NH3F-2011			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			23 Feb 2024 17:35	1
Batch ID: R460189 (0)		Test Name : SUBCONTRACT ANALYSIS - ENTEROCOCCI			Matrix: Water	
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			29 Feb 2024 16:49	1
HS24020649-01	OF001 WK 4	12 Feb 2024 07:05			29 Feb 2024 16:49	1

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207578 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608						
MBLK	Sample ID: MBLK-207578	Units: UG/L		Analysis Date: 22-Feb-2024 01:57						
Client ID:	Run ID: ECD_17_459493		SeqNo: 7846104		PrepDate: 19-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4'-DDD	U	0.00250								
4,4'-DDE	U	0.00250								
4,4'-DDT	U	0.00250								
Aldrin	U	0.00125								
alpha-BHC	U	0.00125								
beta-BHC	U	0.00125								
Chlordane	U	0.0250								
delta-BHC	U	0.00125								
Dieldrin	U	0.00250								
Endosulfan I	U	0.00125								
Endosulfan II	U	0.00250								
Endosulfan sulfate	U	0.00250								
Endrin	U	0.00250								
Endrin aldehyde	U	0.00250								
gamma-BHC	U	0.00125								
Heptachlor	U	0.00125								
Heptachlor epoxide	U	0.00125								
Toxaphene	U	0.0250								
Surr: Decachlorobiphenyl	0.01962	0	0.02	0	98.1	61 - 154				
Surr: Tetrachloro-m-xylene	0.01996	0	0.02	0	99.8	60 - 144				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207578 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608					
LCS		Sample ID: LCS-207578		Units: UG/L		Analysis Date: 22-Feb-2024 01:35			
Client ID:		Run ID: ECD_17_459493		SeqNo: 7846102		PrepDate: 19-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
4,4'-DDD	0.04629	0.00250	0.05	0	92.6	53 - 144			
4,4'-DDE	0.04174	0.00250	0.05	0	83.5	55 - 144			
4,4'-DDT	0.04754	0.00250	0.05	0	95.1	53 - 149			
Aldrin	0.0178	0.00125	0.025	0	71.2	47 - 141			
alpha-BHC	0.02197	0.00125	0.025	0	87.9	51 - 141			
beta-BHC	0.02015	0.00125	0.025	0	80.6	58 - 144			
delta-BHC	0.02156	0.00125	0.025	0	86.2	48 - 146			
Dieldrin	0.04501	0.00250	0.05	0	90.0	56 - 144			
Endosulfan I	0.01987	0.00125	0.025	0	79.5	55 - 141			
Endosulfan II	0.04103	0.00250	0.05	0	82.1	57 - 144			
Endosulfan sulfate	0.0464	0.00250	0.05	0	92.8	58 - 145			
Endrin	0.04536	0.00250	0.05	0	90.7	60 - 163			
Endrin aldehyde	0.0497	0.00250	0.05	0	99.4	59 - 158			
gamma-BHC	0.02431	0.00125	0.025	0	97.2	53 - 142			
Heptachlor	0.02393	0.00125	0.025	0	95.7	51 - 144			
Heptachlor epoxide	0.02044	0.00125	0.025	0	81.8	55 - 142			
Surr: Decachlorobiphenyl	0.0172	0	0.02	0	86.0	61 - 154			
Surr: Tetrachloro-m-xylene	0.02121	0	0.02	0	106	60 - 144			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207578 (0)		Instrument: ECD_17		Method: CHLORINATED PEST/PCBS BY E608					
LCSD		Sample ID: LCSD-207578		Units: UG/L		Analysis Date: 22-Feb-2024 01:46			
Client ID:		Run ID: ECD_17_459493		SeqNo: 7846103		PrepDate: 19-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
4,4'-DDD	0.0419	0.00250	0.05	0	83.8	53 - 144	0.04629	9.96	20
4,4'-DDE	0.04114	0.00250	0.05	0	82.3	55 - 144	0.04174	1.45	20
4,4'-DDT	0.04428	0.00250	0.05	0	88.6	53 - 149	0.04754	7.1	20
Aldrin	0.01722	0.00125	0.025	0	68.9	47 - 141	0.0178	3.29	20
alpha-BHC	0.02106	0.00125	0.025	0	84.3	51 - 141	0.02197	4.23	20
beta-BHC	0.01881	0.00125	0.025	0	75.2	58 - 144	0.02015	6.88	20
delta-BHC	0.02021	0.00125	0.025	0	80.9	48 - 146	0.02156	6.42	20
Dieldrin	0.04177	0.00250	0.05	0	83.5	56 - 144	0.04501	7.47	20
Endosulfan I	0.01883	0.00125	0.025	0	75.3	55 - 141	0.01987	5.39	20
Endosulfan II	0.03876	0.00250	0.05	0	77.5	57 - 144	0.04103	5.7	20
Endosulfan sulfate	0.04239	0.00250	0.05	0	84.8	58 - 145	0.0464	9.04	20
Endrin	0.04212	0.00250	0.05	0	84.2	60 - 163	0.04536	7.4	20
Endrin aldehyde	0.04572	0.00250	0.05	0	91.4	59 - 158	0.0497	8.36	20
gamma-BHC	0.02282	0.00125	0.025	0	91.3	53 - 142	0.02431	6.31	20
Heptachlor	0.02264	0.00125	0.025	0	90.6	51 - 144	0.02393	5.54	20
Heptachlor epoxide	0.01898	0.00125	0.025	0	75.9	55 - 142	0.02044	7.38	20
Surr: Decachlorobiphenyl	0.01616	0	0.02	0	80.8	61 - 154	0.0172	6.19	20
Surr: Tetrachloro-m-xylene	0.02078	0	0.02	0	104	60 - 144	0.02121	2.06	20

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207578 (1)		Instrument: ECD_7		Method: CHLORINATED PEST/PCBS BY E608					
MBLK	Sample ID: MBLK-207578	Units: UG/L		Analysis Date: 20-Feb-2024 20:16					
Client ID:	Run ID: ECD_7_459376		SeqNo: 7843351		PrepDate: 19-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	U	0.0200							
Aroclor 1221	U	0.0200							
Aroclor 1232	U	0.0200							
Aroclor 1242	U	0.0200							
Aroclor 1248	U	0.0200							
Aroclor 1254	U	0.0200							
Aroclor 1260	U	0.0200							
Surr: Decachlorobiphenyl	0.02701	0	0.02	0	135	61 - 154			
Surr: Tetrachloro-m-xylene	0.02034	0	0.02	0	102	60 - 144			

LCS	Sample ID: LCS1-207578	Units: UG/L		Analysis Date: 20-Feb-2024 20:28					
Client ID:	Run ID: ECD_7_459376		SeqNo: 7843352		PrepDate: 19-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4589	0.0200	0.5	0	91.8	54 - 138			
Aroclor 1260	0.5676	0.0200	0.5	0	114	57 - 136			
Surr: Decachlorobiphenyl	0.02803	0	0.02	0	140	61 - 154			
Surr: Tetrachloro-m-xylene	0.01955	0	0.02	0	97.8	60 - 144			

LCSD	Sample ID: LCSD1-207578	Units: UG/L		Analysis Date: 20-Feb-2024 20:41					
Client ID:	Run ID: ECD_7_459376		SeqNo: 7843353		PrepDate: 19-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aroclor 1016	0.4662	0.0200	0.5	0	93.2	54 - 138	0.4589	1.58	20
Aroclor 1260	0.5814	0.0200	0.5	0	116	57 - 136	0.5676	2.4	20
Surr: Decachlorobiphenyl	0.02774	0	0.02	0	139	61 - 154	0.02803	1.03	20
Surr: Tetrachloro-m-xylene	0.02002	0	0.02	0	100	60 - 144	0.01955	2.4	20

The following samples were analyzed in this batch: HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-207370	Units: ug/L		Analysis Date: 21-Feb-2024 19:18					
Client ID:	Run ID: ICPMS07_459413		SeqNo: 7845423		PrepDate: 14-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	U	10.0							
Antimony	U	5.00							
Arsenic	U	2.00							
Barium	U	4.00							
Beryllium	U	5.00							
Boron	U	20.0							
Cadmium	U	2.00							
Chromium	U	4.00							
Cobalt	U	5.00							
Copper	U	2.00							
Iron	U	200							
Lead	U	2.00							
Magnesium	U	500							
Manganese	U	5.00							
Molybdenum	U	5.00							
Nickel	U	2.00							
Selenium	U	2.00							
Silver	U	2.00							
Thallium	U	2.00							
Tin	U	5.00							
Titanium	U	5.00							
Zinc	U	4.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
LCS		Sample ID: LCS-207370		Units: ug/L		Analysis Date: 21-Feb-2024 19:21			
Client ID:		Run ID: ICPMS07_459413		SeqNo: 7845424		PrepDate: 14-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	102.2	10.0	100	0	102	85 - 115			
Antimony	48.88	5.00	50	0	97.8	85 - 115			
Arsenic	47.71	2.00	50	0	95.4	85 - 115			
Barium	48.5	4.00	50	0	97.0	85 - 115			
Beryllium	50.98	5.00	50	0	102	85 - 115			
Boron	515.3	20.0	500	0	103	85 - 115			
Cadmium	48.33	2.00	50	0	96.7	85 - 115			
Chromium	50.32	4.00	50	0	101	85 - 115			
Cobalt	50.61	5.00	50	0	101	85 - 115			
Copper	47.58	2.00	50	0	95.2	85 - 115			
Iron	4917	200	5000	0	98.3	85 - 115			
Lead	49.75	2.00	50	0	99.5	85 - 115			
Magnesium	4944	500	5000	0	98.9	85 - 115			
Manganese	47.97	5.00	50	0	95.9	85 - 115			
Molybdenum	45.13	5.00	50	0	90.3	85 - 115			
Nickel	48.76	2.00	50	0	97.5	85 - 115			
Selenium	47.7	2.00	50	0	95.4	85 - 115			
Silver	50.06	2.00	50	0	100	85 - 115			
Thallium	45.91	2.00	50	0	91.8	85 - 115			
Tin	47.74	5.00	50	0	95.5	85 - 115			
Titanium	94.45	5.00	100	0	94.4	85 - 115			
Zinc	51.57	4.00	50	0	103	85 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS		Sample ID: HS24020710-07MS		Units: ug/L		Analysis Date: 21-Feb-2024 19:32			
Client ID:		Run ID: ICPMS07_459413		SeqNo: 7845429		PrepDate: 14-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	643.8	10.0	100	526.7	117	70 - 130			O
Antimony	46.57	5.00	50	0	93.1	70 - 130			
Arsenic	45.99	2.00	50	0	92.0	70 - 130			
Barium	99.33	4.00	50	51.97	94.7	70 - 130			
Beryllium	50.19	5.00	50	0.314	99.8	70 - 130			
Boron	547	20.0	500	41.22	101	70 - 130			
Cadmium	46.91	2.00	50	0.126	93.6	70 - 130			
Chromium	46.11	4.00	50	0.568	91.1	70 - 130			
Cobalt	60.56	5.00	50	13.98	93.2	70 - 130			
Copper	45.38	2.00	50	0.853	89.0	70 - 130			
Iron	19600	200	5000	14750	96.9	70 - 130			
Lead	48.08	2.00	50	0.126	95.9	70 - 130			
Magnesium	17120	500	5000	12300	96.4	70 - 130			
Manganese	532.1	5.00	50	482.5	99.3	70 - 130			O
Molybdenum	43.51	5.00	50	0	87.0	70 - 130			
Nickel	65.06	2.00	50	19.29	91.5	70 - 130			
Selenium	45.27	2.00	50	0	90.5	70 - 130			
Silver	47.28	2.00	50	0	94.6	70 - 130			
Thallium	44.36	2.00	50	0	88.7	70 - 130			
Tin	47.05	5.00	50	0.159	93.8	70 - 130			
Titanium	90.85	5.00	100	0.983	89.9	70 - 130			
Zinc	108.7	4.00	50	62.33	92.8	70 - 130			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MS	Sample ID: HS24020710-06MS	Units: ug/L		Analysis Date: 21-Feb-2024 19:25					
Client ID:	Run ID: ICPMS07_459413	SeqNo: 7845426		PrepDate: 14-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Aluminum	939.9	10.0	100	834.6	105	70 - 130			O
Antimony	46.67	5.00	50	0	93.3	70 - 130			
Arsenic	54.33	2.00	50	8.383	91.9	70 - 130			
Barium	253.6	4.00	50	204.5	98.3	70 - 130			O
Beryllium	50.06	5.00	50	0.345	99.4	70 - 130			
Boron	537	20.0	500	37.37	99.9	70 - 130			
Cadmium	48.56	2.00	50	0.285	96.5	70 - 130			
Chromium	48.68	4.00	50	1.157	95.0	70 - 130			
Cobalt	62.58	5.00	50	15.24	94.7	70 - 130			
Copper	47.16	2.00	50	0.92	92.5	70 - 130			
Iron	53160	200	5000	48770	87.7	70 - 130			O
Lead	49.14	2.00	50	0.268	97.8	70 - 130			
Magnesium	7252	500	5000	2597	93.1	70 - 130			
Manganese	82.98	5.00	50	31.81	102	70 - 130			
Molybdenum	43.94	5.00	50	0	87.9	70 - 130			
Nickel	79.48	2.00	50	31.9	95.1	70 - 130			
Selenium	46.47	2.00	50	0	92.9	70 - 130			
Silver	48.29	2.00	50	0	96.6	70 - 130			
Thallium	45.46	2.00	50	0.391	90.1	70 - 130			
Tin	47.76	5.00	50	0.167	95.2	70 - 130			
Titanium	93.84	5.00	100	1.848	92.0	70 - 130			
Zinc	98.71	4.00	50	48.12	101	70 - 130			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
MSD		Sample ID: HS24020710-07MSD		Units: ug/L		Analysis Date: 21-Feb-2024 19:35				
Client ID:		Run ID: ICPMS07_459413		SeqNo: 7845430		PrepDate: 14-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	647.2	10.0	100	526.7	121	70 - 130	643.8	0.533	20	O
Antimony	47.35	5.00	50	0	94.7	70 - 130	46.57	1.66	20	
Arsenic	46.88	2.00	50	0	93.8	70 - 130	45.99	1.92	20	
Barium	101.5	4.00	50	51.97	99.1	70 - 130	99.33	2.2	20	
Beryllium	51.09	5.00	50	0.314	102	70 - 130	50.19	1.78	20	
Boron	553.3	20.0	500	41.22	102	70 - 130	547	1.15	20	
Cadmium	47.65	2.00	50	0.126	95.1	70 - 130	46.91	1.58	20	
Chromium	44.62	4.00	50	0.568	88.1	70 - 130	46.11	3.28	20	
Cobalt	61.2	5.00	50	13.98	94.4	70 - 130	60.56	1.05	20	
Copper	46.21	2.00	50	0.853	90.7	70 - 130	45.38	1.82	20	
Iron	19770	200	5000	14750	100	70 - 130	19600	0.896	20	
Lead	47.57	2.00	50	0.126	94.9	70 - 130	48.08	1.07	20	
Magnesium	17170	500	5000	12300	97.4	70 - 130	17120	0.273	20	
Manganese	537	5.00	50	482.5	109	70 - 130	532.1	0.912	20	O
Molybdenum	43.93	5.00	50	0	87.9	70 - 130	43.51	0.958	20	
Nickel	65.98	2.00	50	19.29	93.4	70 - 130	65.06	1.41	20	
Selenium	45.76	2.00	50	0	91.5	70 - 130	45.27	1.07	20	
Silver	47.61	2.00	50	0	95.2	70 - 130	47.28	0.698	20	
Thallium	44.84	2.00	50	0	89.7	70 - 130	44.36	1.08	20	
Tin	47.55	5.00	50	0.159	94.8	70 - 130	47.05	1.05	20	
Titanium	92.64	5.00	100	0.983	91.7	70 - 130	90.85	1.95	20	
Zinc	111.5	4.00	50	62.33	98.4	70 - 130	108.7	2.54	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207370 (0)		Instrument: ICPMS07		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
MSD		Sample ID: HS24020710-06MSD		Units: ug/L		Analysis Date: 21-Feb-2024 19:28				
Client ID:		Run ID: ICPMS07_459413		SeqNo: 7845427		PrepDate: 14-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	915.4	10.0	100	834.6	80.8	70 - 130	939.9	2.65	20	O
Antimony	44.14	5.00	50	0	88.3	70 - 130	46.67	5.58	20	
Arsenic	51.42	2.00	50	8.383	86.1	70 - 130	54.33	5.51	20	
Barium	245.8	4.00	50	204.5	82.7	70 - 130	253.6	3.13	20	O
Beryllium	49.13	5.00	50	0.345	97.6	70 - 130	50.06	1.87	20	
Boron	530.7	20.0	500	37.37	98.7	70 - 130	537	1.19	20	
Cadmium	47.04	2.00	50	0.285	93.5	70 - 130	48.56	3.16	20	
Chromium	42.99	4.00	50	1.157	83.7	70 - 130	48.68	12.4	20	
Cobalt	59.38	5.00	50	15.24	88.3	70 - 130	62.58	5.26	20	
Copper	44.66	2.00	50	0.92	87.5	70 - 130	47.16	5.47	20	
Iron	50360	200	5000	48770	31.7	70 - 130	53160	5.41	20	SO
Lead	47.95	2.00	50	0.268	95.4	70 - 130	49.14	2.47	20	
Magnesium	7022	500	5000	2597	88.5	70 - 130	7252	3.22	20	
Manganese	78.87	5.00	50	31.81	94.1	70 - 130	82.98	5.08	20	
Molybdenum	42.7	5.00	50	0	85.4	70 - 130	43.94	2.87	20	
Nickel	74.63	2.00	50	31.9	85.4	70 - 130	79.48	6.3	20	
Selenium	43.72	2.00	50	0	87.4	70 - 130	46.47	6.11	20	
Silver	47.17	2.00	50	0	94.3	70 - 130	48.29	2.36	20	
Thallium	42.74	2.00	50	0.391	84.7	70 - 130	45.46	6.16	20	
Tin	46.51	5.00	50	0.167	92.7	70 - 130	47.76	2.65	20	
Titanium	88.19	5.00	100	1.848	86.3	70 - 130	93.84	6.21	20	
Zinc	93.69	4.00	50	48.12	91.1	70 - 130	98.71	5.21	20	
The following samples were analyzed in this batch: HS24020649-01										

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207461	Units: ug/L		Analysis Date: 16-Feb-2024 16:28					
Client ID:	Run ID: SV-4_459142	SeqNo: 7844204		PrepDate: 16-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	U	5.00							
1,2,4-Trichlorobenzene	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Diphenylhydrazine	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2,4,5-Trichlorophenol	U	5.00							
2,4,6-Trichlorophenol	U	5.00							
2,4-Dichlorophenol	U	5.00							
2,4-Dimethylphenol	U	5.00							
2,4-Dinitrophenol	U	5.00							
2,4-Dinitrotoluene	U	5.00							
2,6-Dichlorophenol	U	5.00							
2,6-Dinitrotoluene	U	5.00							
2-Chloronaphthalene	U	5.00							
2-Chlorophenol	U	5.00							
2-Methylphenol	U	5.00							
2-Nitrophenol	U	5.00							
3&4-Methylphenol	U	5.00							
3,3'-Dichlorobenzidine	U	5.00							
4,6-Dinitro-2-methylphenol	U	5.00							
4-Bromophenyl phenyl ether	U	5.00							
4-Chloro-3-methylphenol	U	5.00							
4-Chlorophenyl phenyl ether	U	5.00							
4-Nitrophenol	U	5.00							
Acenaphthene	U	5.00							
Acenaphthylene	U	5.00							
Anthracene	U	5.00							
Benz(a)anthracene	U	5.00							
Benzidine	U	5.00							
Benzo(a)pyrene	U	5.00							
Benzo(b)fluoranthene	U	5.00							
Benzo(g,h,i)perylene	U	5.00							
Benzo(k)fluoranthene	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207461	Units: ug/L		Analysis Date: 16-Feb-2024 16:28					
Client ID:	Run ID: SV-4_459142	SeqNo: 7844204		PrepDate: 16-Feb-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	U	5.00							
Bis(2-chloroethyl)ether	U	5.00							
Bis(2-chloroisopropyl)ether	U	5.00							
Bis(2-ethylhexyl)phthalate	U	5.00							
Butyl benzyl phthalate	U	5.00							
Chrysene	U	5.00							
Dibenz(a,h)anthracene	U	5.00							
Diethyl phthalate	U	5.00							
Dimethyl phthalate	U	5.00							
Di-n-butyl phthalate	U	5.00							
Di-n-octyl phthalate	U	5.00							
Fluoranthene	U	5.00							
Fluorene	U	5.00							
Hexachlorobenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Hexachlorocyclopentadiene	U	5.00							
Hexachloroethane	U	5.00							
Indeno(1,2,3-cd)pyrene	U	5.00							
Isophorone	U	5.00							
Naphthalene	U	5.00							
Nitrobenzene	U	5.00							
N-Nitrosodiethylamine	U	5.00							
N-Nitrosodimethylamine	U	5.00							
N-Nitroso-di-n-butylamine	U	5.00							
N-Nitrosodi-n-propylamine	U	5.00							
N-Nitrosodiphenylamine	U	5.00							
Nonylphenol	U	5.00							
Pentachlorobenzene	U	5.00							
Pentachlorophenol	U	5.00							
Phenanthrene	U	5.00							
Phenol	U	5.00							
Pyrene	U	5.00							
Pyridine	U	5.00							
Cresols, Total	U	5.00							

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
MBLK	Sample ID: MBLK-207461	Units: ug/L		Analysis Date: 16-Feb-2024 16:28					
Client ID:	Run ID: SV-4_459142		SeqNo: 7844204		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: 2,4,6-Tribromophenol	64.15	5.00	100	0	64.2	42 - 124			
Surr: 2-Fluorobiphenyl	69.95	5.00	100	0	70.0	48 - 120			
Surr: 2-Fluorophenol	59.46	5.00	100	0	59.5	20 - 120			
Surr: 4-Terphenyl-d14	72.32	5.00	100	0	72.3	51 - 135			
Surr: Nitrobenzene-d5	71.07	5.00	100	0	71.1	41 - 120			
Surr: Phenol-d6	64.23	5.00	100	0	64.2	20 - 120			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-207461		Units: ug/L		Analysis Date: 16-Feb-2024 16:49			
Client ID:		Run ID: SV-4_459142		SeqNo: 7844205		PrepDate: 16-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	70.64	5.00	100	0	70.6	49 - 120			
1,2,4-Trichlorobenzene	73.16	5.00	100	0	73.2	54 - 118			
1,2-Dichlorobenzene	72.93	5.00	100	0	72.9	49 - 115			
1,2-Diphenylhydrazine	83.14	5.00	100	0	83.1	57 - 134			
1,3-Dichlorobenzene	72.12	5.00	100	0	72.1	56 - 115			
1,4-Dichlorobenzene	72.36	5.00	100	0	72.4	56 - 115			
2,4,5-Trichlorophenol	74.15	5.00	100	0	74.1	52 - 115			
2,4,6-Trichlorophenol	75.9	5.00	100	0	75.9	56 - 115			
2,4-Dichlorophenol	76.46	5.00	100	0	76.5	53 - 115			
2,4-Dimethylphenol	82.23	5.00	100	0	82.2	53 - 115			
2,4-Dinitrophenol	73.41	5.00	100	0	73.4	47 - 115			
2,4-Dinitrotoluene	75.47	5.00	100	0	75.5	56 - 115			
2,6-Dichlorophenol	81.65	5.00	100	0	81.6	41 - 124			
2,6-Dinitrotoluene	80.22	5.00	100	0	80.2	57 - 115			
2-Chloronaphthalene	92.74	5.00	100	0	92.7	65 - 125			
2-Chlorophenol	76.99	5.00	100	0	77.0	54 - 115			
2-Methylphenol	78.07	5.00	100	0	78.1	53 - 115			
2-Nitrophenol	75.89	5.00	100	0	75.9	53 - 115			
3&4-Methylphenol	100.2	5.00	100	0	100	48 - 115			
3,3'-Dichlorobenzidine	75.44	5.00	100	0	75.4	25 - 115			
4,6-Dinitro-2-methylphenol	75.99	5.00	100	0	76.0	51 - 121			
4-Bromophenyl phenyl ether	75.84	5.00	100	0	75.8	49 - 115			
4-Chloro-3-methylphenol	81.53	5.00	100	0	81.5	51 - 115			
4-Chlorophenyl phenyl ether	74.19	5.00	100	0	74.2	56 - 115			
4-Nitrophenol	68.24	5.00	100	0	68.2	26 - 133			
Acenaphthene	74.56	5.00	100	0	74.6	57 - 115			
Acenaphthylene	74.46	5.00	100	0	74.5	57 - 118			
Anthracene	77.33	5.00	100	0	77.3	65 - 115			
Benz(a)anthracene	78.34	5.00	100	0	78.3	53 - 115			
Benzidine	15.41	5.00	100	0	15.4	10 - 115			
Benzo(a)pyrene	77.96	5.00	100	0	78.0	57 - 115			
Benzo(b)fluoranthene	96.39	5.00	100	0	96.4	54 - 117			
Benzo(g,h,i)perylene	78.24	5.00	100	0	78.2	56 - 115			
Benzo(k)fluoranthene	89.62	5.00	100	0	89.6	50 - 115			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCS		Sample ID: LCS-207461		Units: ug/L		Analysis Date: 16-Feb-2024 16:49			
Client ID:		Run ID: SV-4_459142		SeqNo: 7844205		PrepDate: 16-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bis(2-chloroethoxy)methane	88.92	5.00	100	0	88.9	54 - 115			
Bis(2-chloroethyl)ether	73.96	5.00	100	0	74.0	56 - 115			
Bis(2-chloroisopropyl)ether	77.67	5.00	100	0	77.7	48 - 115			
Bis(2-ethylhexyl)phthalate	78.67	5.00	100	0	78.7	50 - 115			
Butyl benzyl phthalate	77.9	5.00	100	0	77.9	51 - 115			
Chrysene	72.19	5.00	100	0	72.2	52 - 120			
Dibenz(a,h)anthracene	78.54	5.00	100	0	78.5	56 - 115			
Diethyl phthalate	76.76	5.00	100	0	76.8	57 - 115			
Dimethyl phthalate	76.48	5.00	100	0	76.5	56 - 115			
Di-n-butyl phthalate	83.75	5.00	100	0	83.7	54 - 115			
Di-n-octyl phthalate	92.28	5.00	100	0	92.3	49 - 115			
Fluoranthene	82.45	5.00	100	0	82.5	58 - 115			
Fluorene	75.22	5.00	100	0	75.2	56 - 115			
Hexachlorobenzene	76.19	5.00	100	0	76.2	54 - 115			
Hexachlorobutadiene	71.11	5.00	100	0	71.1	51 - 115			
Hexachlorocyclopentadiene	73.59	5.00	100	0	73.6	48 - 115			
Hexachloroethane	72.4	5.00	100	0	72.4	54 - 115			
Indeno(1,2,3-cd)pyrene	78.59	5.00	100	0	78.6	51 - 115			
Isophorone	78.76	5.00	100	0	78.8	55 - 115			
Naphthalene	74.23	5.00	100	0	74.2	55 - 115			
Nitrobenzene	76.78	5.00	100	0	76.8	40 - 124			
N-Nitrosodiethylamine	28.99	5.00	50	0	58.0	40 - 130			
N-Nitrosodimethylamine	76.26	5.00	100	0	76.3	42 - 115			
N-Nitroso-di-n-butylamine	32.53	5.00	50	0	65.1	40 - 130			
N-Nitrosodi-n-propylamine	78.34	5.00	100	0	78.3	55 - 119			
N-Nitrosodiphenylamine	76.48	5.00	100	0	76.5	52 - 115			
Pentachlorobenzene	74.65	5.00	100	0	74.6	50 - 117			
Pentachlorophenol	71.58	5.00	100	0	71.6	45 - 125			
Phenanthrene	77.82	5.00	100	0	77.8	57 - 115			
Phenol	83.91	5.00	100	0	83.9	38 - 115			
Pyrene	89.59	5.00	100	0	89.6	54 - 119			
Pyridine	56.34	5.00	100	0	56.3	34 - 115			
Cresols, Total	178.3	5.00	200	0	89.1	48 - 115			
Surr: 2,4,6-Tribromophenol	62.09	5.00	100	0	62.1	42 - 124			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCS	Sample ID: LCS-207461	Units: ug/L			Analysis Date: 16-Feb-2024 16:49					
Client ID:	Run ID: SV-4_459142			SeqNo: 7844205		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorobiphenyl	64.86	5.00	100	0	64.9	48 - 120				
Surr: 2-Fluorophenol	57.35	5.00	100	0	57.3	20 - 120				
Surr: 4-Terphenyl-d14	78.7	5.00	100	0	78.7	51 - 135				
Surr: Nitrobenzene-d5	66.65	5.00	100	0	66.7	41 - 120				
Surr: Phenol-d6	68.05	5.00	100	0	68.0	20 - 120				

LCS	Sample ID: LCS1-207461	Units: ug/L			Analysis Date: 16-Feb-2024 17:30					
Client ID:	Run ID: SV-4_459142			SeqNo: 7844207		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	40.94	5.00	50	0	81.9	40 - 140				
Surr: 2,4,6-Tribromophenol	63.91	5.00	100	0	63.9	42 - 124				
Surr: 2-Fluorobiphenyl	66.74	5.00	100	0	66.7	48 - 120				
Surr: 2-Fluorophenol	57.27	5.00	100	0	57.3	20 - 120				
Surr: 4-Terphenyl-d14	70.91	5.00	100	0	70.9	51 - 135				
Surr: Nitrobenzene-d5	54.56	5.00	100	0	54.6	41 - 120				
Surr: Phenol-d6	61.72	5.00	100	0	61.7	20 - 120				

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE					
LCSD		Sample ID: LCSD-207461		Units: ug/L		Analysis Date: 16-Feb-2024 17:09			
Client ID:		Run ID: SV-4_459142		SeqNo: 7844206		PrepDate: 16-Feb-2024		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2,4,5-Tetrachlorobenzene	75.21	5.00	100	0	75.2	49 - 120	70.64	6.27	20
1,2,4-Trichlorobenzene	70.99	5.00	100	0	71.0	54 - 118	73.16	3.01	20
1,2-Dichlorobenzene	74.14	5.00	100	0	74.1	49 - 115	72.93	1.64	20
1,2-Diphenylhydrazine	76.63	5.00	100	0	76.6	57 - 134	83.14	8.16	20
1,3-Dichlorobenzene	72.98	5.00	100	0	73.0	56 - 115	72.12	1.18	20
1,4-Dichlorobenzene	73.95	5.00	100	0	73.9	56 - 115	72.36	2.17	20
2,4,5-Trichlorophenol	74.8	5.00	100	0	74.8	52 - 115	74.15	0.88	20
2,4,6-Trichlorophenol	77.34	5.00	100	0	77.3	56 - 115	75.9	1.88	20
2,4-Dichlorophenol	75.9	5.00	100	0	75.9	53 - 115	76.46	0.744	20
2,4-Dimethylphenol	81.03	5.00	100	0	81.0	53 - 115	82.23	1.47	20
2,4-Dinitrophenol	71.39	5.00	100	0	71.4	47 - 115	73.41	2.79	20
2,4-Dinitrotoluene	70.35	5.00	100	0	70.3	56 - 115	75.47	7.02	20
2,6-Dinitrotoluene	77.19	5.00	100	0	77.2	57 - 115	80.22	3.85	20
2-Chloronaphthalene	94.02	5.00	100	0	94.0	65 - 125	92.74	1.36	20
2-Chlorophenol	80.11	5.00	100	0	80.1	54 - 115	76.99	3.98	20
2-Methylphenol	82.35	5.00	100	0	82.4	53 - 115	78.07	5.34	20
2-Nitrophenol	75.47	5.00	100	0	75.5	53 - 115	75.89	0.556	20
3&4-Methylphenol	104.4	5.00	100	0	104	48 - 115	100.2	4.1	20
3,3'-Dichlorobenzidine	80.91	5.00	100	0	80.9	25 - 115	75.44	7	20
4,6-Dinitro-2-methylphenol	75.44	5.00	100	0	75.4	51 - 121	75.99	0.725	20
4-Bromophenyl phenyl ether	76.85	5.00	100	0	76.9	49 - 115	75.84	1.32	20
4-Chloro-3-methylphenol	79.93	5.00	100	0	79.9	51 - 115	81.53	1.98	20
4-Chlorophenyl phenyl ether	73.15	5.00	100	0	73.1	56 - 115	74.19	1.41	20
4-Nitrophenol	65.13	5.00	100	0	65.1	26 - 133	68.24	4.66	20
Acenaphthene	74.53	5.00	100	0	74.5	57 - 115	74.56	0.0332	20
Acenaphthylene	74.94	5.00	100	0	74.9	57 - 118	74.46	0.633	20
Anthracene	75.79	5.00	100	0	75.8	65 - 115	77.33	2.01	20
Benz(a)anthracene	79.45	5.00	100	0	79.5	53 - 115	78.34	1.41	20
Benzidine	14.75	5.00	100	0	14.7	10 - 115	15.41	4.36	20
Benzo(a)pyrene	78.51	5.00	100	0	78.5	57 - 115	77.96	0.697	20
Benzo(b)fluoranthene	85.89	5.00	100	0	85.9	54 - 117	96.39	11.5	20
Benzo(g,h,i)perylene	78.58	5.00	100	0	78.6	56 - 115	78.24	0.433	20
Benzo(k)fluoranthene	79.15	5.00	100	0	79.1	50 - 115	89.62	12.4	20
Bis(2-chloroethoxy)methane	89.54	5.00	100	0	89.5	54 - 115	88.92	0.685	20

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-207461		Units: ug/L		Analysis Date: 16-Feb-2024 17:09				
Client ID:		Run ID: SV-4_459142		SeqNo: 7844206		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethyl)ether	75.1	5.00	100	0	75.1	56 - 115	73.96	1.53	20	
Bis(2-chloroisopropyl)ether	80.78	5.00	100	0	80.8	48 - 115	77.67	3.92	20	
Bis(2-ethylhexyl)phthalate	82.99	5.00	100	0	83.0	50 - 115	78.67	5.34	20	
Butyl benzyl phthalate	83.54	5.00	100	0	83.5	51 - 115	77.9	6.99	20	
Chrysene	76.04	5.00	100	0	76.0	52 - 120	72.19	5.19	20	
Dibenz(a,h)anthracene	80.95	5.00	100	0	81.0	56 - 115	78.54	3.02	20	
Diethyl phthalate	76.9	5.00	100	0	76.9	57 - 115	76.76	0.187	20	
Dimethyl phthalate	74.96	5.00	100	0	75.0	56 - 115	76.48	2	20	
Di-n-butyl phthalate	87.2	5.00	100	0	87.2	54 - 115	83.75	4.04	20	
Di-n-octyl phthalate	86.78	5.00	100	0	86.8	49 - 115	92.28	6.14	20	
Fluoranthene	81.09	5.00	100	0	81.1	58 - 115	82.45	1.66	20	
Fluorene	73.9	5.00	100	0	73.9	56 - 115	75.22	1.77	20	
Hexachlorobenzene	76.65	5.00	100	0	76.6	54 - 115	76.19	0.595	20	
Hexachlorobutadiene	70.32	5.00	100	0	70.3	51 - 115	71.11	1.12	20	
Hexachlorocyclopentadiene	74.64	5.00	100	0	74.6	48 - 115	73.59	1.42	20	
Hexachloroethane	74.08	5.00	100	0	74.1	54 - 115	72.4	2.29	20	
Indeno(1,2,3-cd)pyrene	80.35	5.00	100	0	80.4	51 - 115	78.59	2.21	20	
Isophorone	79.28	5.00	100	0	79.3	55 - 115	78.76	0.651	20	
Naphthalene	74.3	5.00	100	0	74.3	55 - 115	74.23	0.0865	20	
Nitrobenzene	72.71	5.00	100	0	72.7	40 - 124	76.78	5.45	20	
N-Nitrosodiethylamine	33.04	5.00	50	0	66.1	40 - 130	28.99	13	20	
N-Nitrosodimethylamine	86.4	5.00	100	0	86.4	42 - 115	76.26	12.5	20	
N-Nitroso-di-n-butylamine	32.81	5.00	50	0	65.6	40 - 130	32.53	0.859	20	
N-Nitrosodi-n-propylamine	83.22	5.00	100	0	83.2	55 - 119	78.34	6.04	20	
N-Nitrosodiphenylamine	78.16	5.00	100	0	78.2	52 - 115	76.48	2.18	20	
Pentachlorobenzene	73.33	5.00	100	0	73.3	50 - 117	74.65	1.78	20	
Pentachlorophenol	74.68	5.00	100	0	74.7	45 - 125	71.58	4.24	20	
Phenanthrene	76.2	5.00	100	0	76.2	57 - 115	77.82	2.11	20	
Phenol	87.75	5.00	100	0	87.8	38 - 115	83.91	4.47	20	
Pyrene	78.67	5.00	100	0	78.7	54 - 119	89.59	13	20	
Pyridine	63.27	5.00	100	0	63.3	34 - 115	56.34	11.6	20	
Cresols, Total	186.8	5.00	200	0	93.4	48 - 115	178.3	4.64	20	
Surr: 2,4,6-Tribromophenol	59.78	5.00	100	0	59.8	42 - 124	62.09	3.8	20	
Surr: 2-Fluorobiphenyl	66.16	5.00	100	0	66.2	48 - 120	64.86	1.99	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207461 (0)		Instrument: SV-4		Method: SEMIVOLATILE						
LCSD		Sample ID: LCSD-207461		Units: ug/L		Analysis Date: 16-Feb-2024 17:09				
Client ID:		Run ID: SV-4_459142		SeqNo: 7844206		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 2-Fluorophenol	66.37	5.00	100	0	66.4	20 - 120	57.35	14.6	20	
Surr: 4-Terphenyl-d14	68.71	5.00	100	0	68.7	51 - 135	78.7	13.5	20	
Surr: Nitrobenzene-d5	62.31	5.00	100	0	62.3	41 - 120	66.65	6.74	20	
Surr: Phenol-d6	70.87	5.00	100	0	70.9	20 - 120	68.05	4.07	20	

LCSD		Sample ID: LCSD1-207461		Units: ug/L		Analysis Date: 16-Feb-2024 17:51				
Client ID:		Run ID: SV-4_459142		SeqNo: 7844208		PrepDate: 16-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nonylphenol	39.91	5.00	50	0	79.8	40 - 140	40.94	2.55	20	
Surr: 2,4,6-Tribromophenol	65.54	5.00	100	0	65.5	42 - 124	63.91	2.51	20	
Surr: 2-Fluorobiphenyl	67.7	5.00	100	0	67.7	48 - 120	66.74	1.43	20	
Surr: 2-Fluorophenol	48.25	5.00	100	0	48.3	20 - 120	57.27	17.1	20	
Surr: 4-Terphenyl-d14	77.71	5.00	100	0	77.7	51 - 135	70.91	9.16	20	
Surr: Nitrobenzene-d5	67.09	5.00	100	0	67.1	41 - 120	54.56	20.6	20	R
Surr: Phenol-d6	61.16	5.00	100	0	61.2	20 - 120	61.72	0.92	20	

The following samples were analyzed in this batch: HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458638 (0)		Instrument: VOA10		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 10:17					
Client ID:	Run ID: VOA10_458638	SeqNo: 7827489		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	U	5.00							
Surr: 1,2-Dichloroethane-d4	54.31	5.00	50	0	109	70 - 126			
Surr: 4-Bromofluorobenzene	49.02	5.00	50	0	98.0	82 - 124			
Surr: Dibromofluoromethane	57.07	5.00	50	0	114	77 - 123			
Surr: Toluene-d8	48.74	5.00	50	0	97.5	82 - 127			

LCS	Sample ID: VLCSW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 09:14					
Client ID:	Run ID: VOA10_458638	SeqNo: 7827487		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	17.78	5.00	20	0	88.9	70 - 130			
Surr: 1,2-Dichloroethane-d4	57.69	5.00	50	0	115	70 - 130			
Surr: 4-Bromofluorobenzene	49.93	5.00	50	0	99.9	83 - 122			
Surr: Dibromofluoromethane	56.69	5.00	50	0	113	73 - 126			
Surr: Toluene-d8	49	5.00	50	0	98.0	81 - 119			

LCSD	Sample ID: VLCSDW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 09:35					
Client ID:	Run ID: VOA10_458638	SeqNo: 7827488		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzyl Chloride	17.56	5.00	20	0	87.8	70 - 130	17.78	1.22	20
Surr: 1,2-Dichloroethane-d4	56.87	5.00	50	0	114	70 - 130	57.69	1.45	20
Surr: 4-Bromofluorobenzene	50.16	5.00	50	0	100	83 - 122	49.93	0.459	20
Surr: Dibromofluoromethane	56.16	5.00	50	0	112	73 - 126	56.69	0.943	20
Surr: Toluene-d8	48.37	5.00	50	0	96.7	81 - 119	49	1.29	20

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 11:12					
Client ID:	Run ID: VOA11_458686	SeqNo: 7828606		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	U	5.00							
1,1,2,2-Tetrachloroethane	U	5.00							
1,1,2-Trichloroethane	U	5.00							
1,1-Dichloroethane	U	5.00							
1,1-Dichloroethene	U	5.00							
1,2-Dibromoethane	U	5.00							
1,2-Dichlorobenzene	U	5.00							
1,2-Dichloroethane	U	5.00							
1,2-Dichloropropane	U	5.00							
1,3-Dichlorobenzene	U	5.00							
1,4-Dichlorobenzene	U	5.00							
2-Butanone	U	10.0							
2-Chloroethyl vinyl ether	U	10.0							
Acetonitrile	U	50.0							
Acrolein	U	20.0							
Acrylonitrile	U	10.0							
Benzene	U	5.00							
Bromodichloromethane	U	5.00							
Bromoform	U	5.00							
Bromomethane	U	5.00							
Carbon disulfide	U	10.0							
Carbon tetrachloride	U	5.00							
Chlorobenzene	U	5.00							
Chloroethane	U	5.00							
Chloroform	U	5.00							
Chloromethane	U	5.00							
cis-1,3-Dichloropropene	U	5.00							
Dibromochloromethane	U	5.00							
Dibromomethane	U	5.00							
Ethylbenzene	U	5.00							
Hexachlorobutadiene	U	5.00							
Methylene chloride	U	10.0							
Styrene	U	5.00							
Tetrachloroethene	U	5.00							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
MBLK	Sample ID: VBLKW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 11:12					
Client ID:	Run ID: VOA11_458686		SeqNo: 7828606		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	U	5.00							
trans-1,2-Dichloroethene	U	5.00							
trans-1,3-Dichloropropene	U	5.00							
Trichloroethene	U	5.00							
Vinyl chloride	U	2.00							
Xylenes, Total	U	5.00							
Total Trihalomethanes (TTHMs)	U	5.00							
Surr: 1,2-Dichloroethane-d4	60.2	5.00	50	0	120	70 - 126			
Surr: 4-Bromofluorobenzene	47.72	5.00	50	0	95.4	82 - 124			
Surr: Dibromofluoromethane	51.38	5.00	50	0	103	77 - 123			
Surr: Toluene-d8	53.68	5.00	50	0	107	82 - 127			

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
LCS	Sample ID: VLCSW-240213	Units: ug/L		Analysis Date: 13-Feb-2024 10:09					
Client ID:	Run ID: VOA11_458686		SeqNo: 7828604		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	21.23	5.00	20	0	106	70 - 130			
1,1,2,2-Tetrachloroethane	19.37	5.00	20	0	96.8	70 - 120			
1,1,2-Trichloroethane	20.92	5.00	20	0	105	77 - 113			
1,1-Dichloroethane	21.72	5.00	20	0	109	71 - 122			
1,1-Dichloroethene	20.3	5.00	20	0	102	70 - 130			
1,2-Dibromoethane	19.66	5.00	20	0	98.3	76 - 123			
1,2-Dichlorobenzene	19.5	5.00	20	0	97.5	77 - 113			
1,2-Dichloroethane	21.62	5.00	20	0	108	70 - 124			
1,2-Dichloropropane	21.96	5.00	20	0	110	72 - 119			
1,3-Dichlorobenzene	20.79	5.00	20	0	104	78 - 118			
1,4-Dichlorobenzene	20.23	5.00	20	0	101	79 - 113			
2-Butanone	33.42	10.0	40	0	83.5	70 - 130			
2-Chloroethyl vinyl ether	41.35	10.0	40	0	103	60 - 135			
Acetonitrile	227	50.0	200	0	114	70 - 130			
Acrolein	42.68	20.0	40	0	107	70 - 130			
Acrylonitrile	38.21	10.0	40	0	95.5	70 - 130			
Benzene	21.45	5.00	20	0	107	74 - 120			
Bromodichloromethane	21.23	5.00	20	0	106	74 - 122			
Bromoform	17.48	5.00	20	0	87.4	73 - 128			
Bromomethane	25.91	5.00	20	0	130	70 - 130			
Carbon disulfide	43.09	10.0	40	0	108	70 - 130			
Carbon tetrachloride	20.85	5.00	20	0	104	71 - 125			
Chlorobenzene	20.11	5.00	20	0	101	76 - 113			
Chloroethane	23.19	5.00	20	0	116	70 - 130			
Chloroform	21.62	5.00	20	0	108	71 - 121			
Chloromethane	24.84	5.00	20	0	124	70 - 129			
cis-1,3-Dichloropropene	21.01	5.00	20	0	105	73 - 127			
Dibromochloromethane	21.72	5.00	20	0	109	77 - 122			
Dibromomethane	20.38	5.00	20	0	102	78 - 121			
Ethylbenzene	20.52	5.00	20	0	103	77 - 117			
Hexachlorobutadiene	21.08	5.00	20	0	105	70 - 130			
Methylene chloride	21.19	10.0	20	0	106	70 - 127			
Styrene	20.93	5.00	20	0	105	72 - 126			
Tetrachloroethene	20.16	5.00	20	0	101	76 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
LCS		Sample ID: VLCSW-240213		Units: ug/L		Analysis Date: 13-Feb-2024 10:09			
Client ID:		Run ID: VOA11_458686		SeqNo: 7828604		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	21.26	5.00	20	0	106	77 - 118			
trans-1,2-Dichloroethene	20.38	5.00	20	0	102	72 - 127			
trans-1,3-Dichloropropene	20.36	5.00	20	0	102	77 - 119			
Trichloroethene	21.06	5.00	20	0	105	79 - 120			
Vinyl chloride	25.72	2.00	20	0	129	70 - 130			
Xylenes, Total	58.96	5.00	60	0	98.3	75 - 122			
Total Trihalomethanes (TTHMs)	82.06	5.00	80	0	103	65 - 135			
Surr: 1,2-Dichloroethane-d4	52.83	5.00	50	0	106	70 - 130			
Surr: 4-Bromofluorobenzene	49.75	5.00	50	0	99.5	83 - 122			
Surr: Dibromofluoromethane	49.97	5.00	50	0	99.9	73 - 126			
Surr: Toluene-d8	50.73	5.00	50	0	101	81 - 119			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES						
LCSD		Sample ID: VLCSDW-240213		Units: ug/L		Analysis Date: 13-Feb-2024 10:30				
Client ID:		Run ID: VOA11_458686		SeqNo: 7828605		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	20.4	5.00	20	0	102	70 - 130	21.23	3.99	20	
1,1,2,2-Tetrachloroethane	20.16	5.00	20	0	101	70 - 120	19.37	4.03	20	
1,1,2-Trichloroethane	21.41	5.00	20	0	107	77 - 113	20.92	2.36	20	
1,1-Dichloroethane	20.64	5.00	20	0	103	71 - 122	21.72	5.08	20	
1,1-Dichloroethene	18.92	5.00	20	0	94.6	70 - 130	20.3	7.03	20	
1,2-Dibromoethane	20.18	5.00	20	0	101	76 - 123	19.66	2.61	20	
1,2-Dichlorobenzene	18.93	5.00	20	0	94.6	77 - 113	19.5	2.97	20	
1,2-Dichloroethane	21.23	5.00	20	0	106	70 - 124	21.62	1.81	20	
1,2-Dichloropropane	21.6	5.00	20	0	108	72 - 119	21.96	1.66	20	
1,3-Dichlorobenzene	19.28	5.00	20	0	96.4	78 - 118	20.79	7.53	20	
1,4-Dichlorobenzene	19.35	5.00	20	0	96.8	79 - 113	20.23	4.42	20	
2-Butanone	34.65	10.0	40	0	86.6	70 - 130	33.42	3.61	20	
2-Chloroethyl vinyl ether	41.97	10.0	40	0	105	60 - 135	41.35	1.5	20	
Acetonitrile	211.6	50.0	200	0	106	70 - 130	227	7.03	20	
Acrolein	43.68	20.0	40	0	109	70 - 130	42.68	2.33	20	
Acrylonitrile	40.07	10.0	40	0	100	70 - 130	38.21	4.74	20	
Benzene	20.75	5.00	20	0	104	74 - 120	21.45	3.34	20	
Bromodichloromethane	21.63	5.00	20	0	108	74 - 122	21.23	1.87	20	
Bromoform	17.19	5.00	20	0	86.0	73 - 128	17.48	1.69	20	
Bromomethane	23.87	5.00	20	0	119	70 - 130	25.91	8.2	20	
Carbon disulfide	39.29	10.0	40	0	98.2	70 - 130	43.09	9.24	20	
Carbon tetrachloride	20.5	5.00	20	0	103	71 - 125	20.85	1.69	20	
Chlorobenzene	19.08	5.00	20	0	95.4	76 - 113	20.11	5.28	20	
Chloroethane	22.81	5.00	20	0	114	70 - 130	23.19	1.66	20	
Chloroform	20.54	5.00	20	0	103	71 - 121	21.62	5.12	20	
Chloromethane	23.3	5.00	20	0	116	70 - 129	24.84	6.38	20	
cis-1,3-Dichloropropene	20.45	5.00	20	0	102	73 - 127	21.01	2.7	20	
Dibromochloromethane	20.63	5.00	20	0	103	77 - 122	21.72	5.17	20	
Dibromomethane	20.2	5.00	20	0	101	78 - 121	20.38	0.881	20	
Ethylbenzene	19.26	5.00	20	0	96.3	77 - 117	20.52	6.36	20	
Hexachlorobutadiene	19.58	5.00	20	0	97.9	70 - 130	21.08	7.35	20	
Methylene chloride	20.13	10.0	20	0	101	70 - 127	21.19	5.13	20	
Styrene	20.59	5.00	20	0	103	72 - 126	20.93	1.61	20	
Tetrachloroethene	19.57	5.00	20	0	97.9	76 - 119	20.16	2.98	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
LCSD		Sample ID: VLCSDW-240213		Units: ug/L		Analysis Date: 13-Feb-2024 10:30			
Client ID:		Run ID: VOA11_458686		SeqNo: 7828605		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	20.59	5.00	20	0	103	77 - 118	21.26	3.24	20
trans-1,2-Dichloroethene	19.58	5.00	20	0	97.9	72 - 127	20.38	3.99	20
trans-1,3-Dichloropropene	19.93	5.00	20	0	99.7	77 - 119	20.36	2.1	20
Trichloroethene	20.15	5.00	20	0	101	79 - 120	21.06	4.44	20
Vinyl chloride	24.56	2.00	20	0	123	70 - 130	25.72	4.61	20
Xylenes, Total	57.37	5.00	60	0	95.6	75 - 122	58.96	2.74	20
Total Trihalomethanes (TTHMs)	79.99	5.00	80	0	100.0	65 - 135	82.06	2.55	20
Surr: 1,2-Dichloroethane-d4	53.6	5.00	50	0	107	70 - 130	52.83	1.46	20
Surr: 4-Bromofluorobenzene	50.67	5.00	50	0	101	83 - 122	49.75	1.82	20
Surr: Dibromofluoromethane	49.98	5.00	50	0	100.0	73 - 126	49.97	0.0189	20
Surr: Toluene-d8	50.66	5.00	50	0	101	81 - 119	50.73	0.137	20

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
MS		Sample ID: HS24020319-23MS		Units: ug/L		Analysis Date: 13-Feb-2024 18:57			
Client ID:		Run ID: VOA11_458686		SeqNo: 7829036		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1-Trichloroethane	18.29	5.00	20	0	91.5	70 - 130			
1,1,2,2-Tetrachloroethane	17.47	5.00	20	0	87.3	70 - 123			
1,1,2-Trichloroethane	17.45	5.00	20	0	87.2	70 - 117			
1,1-Dichloroethane	18.72	5.00	20	3.392	76.6	70 - 127			
1,1-Dichloroethene	17.51	5.00	20	4.651	64.3	70 - 130			S
1,2-Dibromoethane	17.27	5.00	20	0	86.4	70 - 124			
1,2-Dichlorobenzene	16.37	5.00	20	0	81.8	70 - 115			
1,2-Dichloroethane	18.94	5.00	20	0	94.7	70 - 127			
1,2-Dichloropropane	19.13	5.00	20	0	95.6	70 - 122			
1,3-Dichlorobenzene	17.1	5.00	20	0	85.5	70 - 119			
1,4-Dichlorobenzene	16.5	5.00	20	0	82.5	70 - 114			
2-Butanone	27.05	10.0	40	0	67.6	70 - 130			S
2-Chloroethyl vinyl ether	28.42	10.0	40	0	71.1	65 - 135			
Acetonitrile	200.5	50.0	200	0	100	70 - 130			
Acrolein	44.68	20.0	40	0	112	70 - 130			
Acrylonitrile	31.82	10.0	40	0	79.6	70 - 130			
Benzene	18.61	5.00	20	0	93.0	70 - 127			
Bromodichloromethane	18.35	5.00	20	0	91.7	70 - 124			
Bromoform	14.08	5.00	20	0	70.4	70 - 129			
Bromomethane	23.39	5.00	20	0	117	70 - 130			
Carbon disulfide	38.54	10.0	40	0	96.3	70 - 130			
Carbon tetrachloride	18.6	5.00	20	0	93.0	70 - 130			
Chlorobenzene	17.96	5.00	20	0	89.8	70 - 114			
Chloroethane	26.76	5.00	20	0	134	70 - 130			S
Chloroform	18.46	5.00	20	0	92.3	70 - 125			
Chloromethane	25.01	5.00	20	0	125	70 - 130			
cis-1,3-Dichloropropene	15.66	5.00	20	0	78.3	70 - 125			
Dibromochloromethane	17.09	5.00	20	0	85.5	70 - 124			
Dibromomethane	18.19	5.00	20	0	91.0	70 - 124			
Ethylbenzene	17.97	5.00	20	0	89.8	70 - 124			
Hexachlorobutadiene	15.83	5.00	20	0	79.2	70 - 130			
Methylene chloride	18.84	10.0	20	0	94.2	70 - 128			
Styrene	18.45	5.00	20	0	92.2	70 - 130			
Tetrachloroethene	18.63	5.00	20	0	93.1	70 - 130			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES					
MS	Sample ID: HS24020319-23MS	Units: ug/L		Analysis Date: 13-Feb-2024 18:57					
Client ID:	Run ID: VOA11_458686		SeqNo: 7829036		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Toluene	18.78	5.00	20	0	93.9	70 - 123			
trans-1,2-Dichloroethene	18.62	5.00	20	0	93.1	70 - 130			
trans-1,3-Dichloropropene	15	5.00	20	0	75.0	70 - 121			
Trichloroethene	18.56	5.00	20	0	92.8	70 - 129			
Vinyl chloride	28.41	2.00	20	2.156	131	70 - 130			S
Xylenes, Total	52.01	5.00	60	0	86.7	70 - 130			
Total Trihalomethanes (TTHMs)	67.98	5.00	80	0	85.0	65 - 135			
Surr: 1,2-Dichloroethane-d4	52.74	5.00	50	0	105	70 - 126			
Surr: 4-Bromofluorobenzene	49.84	5.00	50	0	99.7	82 - 124			
Surr: Dibromofluoromethane	48.63	5.00	50	0	97.3	77 - 123			
Surr: Toluene-d8	50.2	5.00	50	0	100	82 - 127			

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES						
MSD		Sample ID: HS24020319-23MSD		Units: ug/L		Analysis Date: 13-Feb-2024 19:18				
Client ID:		Run ID: VOA11_458686		SeqNo: 7829037		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	17.11	5.00	20	0	85.5	70 - 130	18.29	6.68	20	
1,1,2,2-Tetrachloroethane	18.65	5.00	20	0	93.2	70 - 123	17.47	6.52	20	
1,1,2-Trichloroethane	18.15	5.00	20	0	90.7	70 - 117	17.45	3.94	20	
1,1-Dichloroethane	18.41	5.00	20	3.392	75.1	70 - 127	18.72	1.67	20	
1,1-Dichloroethene	17.24	5.00	20	4.651	63.0	70 - 130	17.51	1.52	20	S
1,2-Dibromoethane	17.2	5.00	20	0	86.0	70 - 124	17.27	0.409	20	
1,2-Dichlorobenzene	18.03	5.00	20	0	90.1	70 - 115	16.37	9.65	20	
1,2-Dichloroethane	18.88	5.00	20	0	94.4	70 - 127	18.94	0.341	20	
1,2-Dichloropropane	18.35	5.00	20	0	91.8	70 - 122	19.13	4.12	20	
1,3-Dichlorobenzene	18.65	5.00	20	0	93.3	70 - 119	17.1	8.66	20	
1,4-Dichlorobenzene	18.84	5.00	20	0	94.2	70 - 114	16.5	13.2	20	
2-Butanone	27.71	10.0	40	0	69.3	70 - 130	27.05	2.44	20	S
2-Chloroethyl vinyl ether	27.92	10.0	40	0	69.8	65 - 135	28.42	1.79	20	
Acetonitrile	208.3	50.0	200	0	104	70 - 130	200.5	3.81	20	
Acrolein	45.72	20.0	40	0	114	70 - 130	44.68	2.3	20	
Acrylonitrile	34.64	10.0	40	0	86.6	70 - 130	31.82	8.5	20	
Benzene	17.92	5.00	20	0	89.6	70 - 127	18.61	3.73	20	
Bromodichloromethane	19	5.00	20	0	95.0	70 - 124	18.35	3.5	20	
Bromoform	15.42	5.00	20	0	77.1	70 - 129	14.08	9.06	20	
Bromomethane	23.65	5.00	20	0	118	70 - 130	23.39	1.13	20	
Carbon disulfide	36.16	10.0	40	0	90.4	70 - 130	38.54	6.37	20	
Carbon tetrachloride	18.55	5.00	20	0	92.7	70 - 130	18.6	0.273	20	
Chlorobenzene	17.8	5.00	20	0	89.0	70 - 114	17.96	0.909	20	
Chloroethane	26.63	5.00	20	0	133	70 - 130	26.76	0.474	20	S
Chloroform	18.38	5.00	20	0	91.9	70 - 125	18.46	0.429	20	
Chloromethane	24.69	5.00	20	0	123	70 - 130	25.01	1.3	20	
cis-1,3-Dichloropropene	15.6	5.00	20	0	78.0	70 - 125	15.66	0.401	20	
Dibromochloromethane	17.43	5.00	20	0	87.2	70 - 124	17.09	1.94	20	
Dibromomethane	17.53	5.00	20	0	87.7	70 - 124	18.19	3.71	20	
Ethylbenzene	18.42	5.00	20	0	92.1	70 - 124	17.97	2.49	20	
Hexachlorobutadiene	19.02	5.00	20	0	95.1	70 - 130	15.83	18.3	20	
Methylene chloride	18.61	10.0	20	0	93.0	70 - 128	18.84	1.22	20	
Styrene	18.69	5.00	20	0	93.5	70 - 130	18.45	1.34	20	
Tetrachloroethene	18.7	5.00	20	0	93.5	70 - 130	18.63	0.395	20	

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458686 (0)		Instrument: VOA11		Method: VOLATILES						
MSD		Sample ID: HS24020319-23MSD		Units: ug/L		Analysis Date: 13-Feb-2024 19:18				
Client ID:		Run ID: VOA11_458686		SeqNo: 7829037		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	19.01	5.00	20	0	95.1	70 - 123	18.78	1.25	20	
trans-1,2-Dichloroethene	16.78	5.00	20	0	83.9	70 - 130	18.62	10.4	20	
trans-1,3-Dichloropropene	15	5.00	20	0	75.0	70 - 121	15	0.00205	20	
Trichloroethene	18.09	5.00	20	0	90.5	70 - 129	18.56	2.56	20	
Vinyl chloride	26.73	2.00	20	2.156	123	70 - 130	28.41	6.11	20	
Xylenes, Total	52.33	5.00	60	0	87.2	70 - 130	52.01	0.62	20	
Total Trihalomethanes (TTHMs)	70.23	5.00	80	0	87.8	65 - 135	67.98	3.25	30	
Surr: 1,2-Dichloroethane-d4	53.68	5.00	50	0	107	70 - 126	52.74	1.77	20	
Surr: 4-Bromofluorobenzene	48.41	5.00	50	0	96.8	82 - 124	49.84	2.92	20	
Surr: Dibromofluoromethane	50.04	5.00	50	0	100	77 - 123	48.63	2.85	20	
Surr: Toluene-d8	51.49	5.00	50	0	103	82 - 127	50.2	2.55	20	
The following samples were analyzed in this batch: HS24020649-01										

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207288 (0)		Instrument: Skalar 02		Method: BIOCHEMICAL OXYGEN DEMAND (BOD) BY SM5210B-2011					
MBLK	Sample ID: MBLK-207288	Units: mg/L		Analysis Date: 18-Feb-2024 15:51					
Client ID:	Run ID: Skalar 02_459171		SeqNo: 7838519		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-207288	Units: mg/L		Analysis Date: 18-Feb-2024 15:51					
Client ID:	Run ID: Skalar 02_459171		SeqNo: 7838518		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	187.6	2.00	198	0	94.7	85 - 115			

DUP	Sample ID: HS24020649-01DUP	Units: mg/L		Analysis Date: 18-Feb-2024 15:51					
Client ID: OF001 WK 4	Run ID: Skalar 02_459171		SeqNo: 7838517		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Biochemical Oxygen Demand	2.95	2.00					2.73	7.75	20

The following samples were analyzed in this batch: HS24020649-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK4

WorkOrder:HS24020649

QC BATCH REPORT

Batch ID: 207293 (0)		Instrument: Skalar 02		Method: CBOD BY SM5210B-2011					
MBLK	Sample ID: MBLK-207293	Units: mg/L		Analysis Date: 18-Feb-2024 15:42					
Client ID:	Run ID: Skalar 02_459938		SeqNo: 7855929		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00							

LCS	Sample ID: LCS-207293	Units: mg/L		Analysis Date: 18-Feb-2024 15:42					
Client ID:	Run ID: Skalar 02_459938		SeqNo: 7855928		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	187.6	2.00	198	0	94.7	85 - 115			

DUP	Sample ID: HS24020664-03DUP	Units: mg/L		Analysis Date: 18-Feb-2024 15:42					
Client ID:	Run ID: Skalar 02_459938		SeqNo: 7855927		PrepDate: 13-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbonaceous Biochemical Oxygen Demand	U	2.00					1.67	0	20

The following samples were analyzed in this batch: HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207498 (0)		Instrument: UV-2450		Method: SURFACTANTS (MBAS) BY SM5540C					
MBLK	Sample ID: MBLK-207498	Units: mg/L 340 MW LAS		Analysis Date: 12-Feb-2024 16:10					
Client ID:	Run ID: UV-2450_459038		SeqNo: 7835745		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
MBAS	U	0.0500							
LCS	Sample ID: LCS-207498	Units: mg/L 340 MW LAS		Analysis Date: 12-Feb-2024 16:10					
Client ID:	Run ID: UV-2450_459038		SeqNo: 7835743		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
MBAS	0.538	0.0500	0.5	0	108	85 - 115			
LCSD	Sample ID: LCSD-207498	Units: mg/L 340 MW LAS		Analysis Date: 12-Feb-2024 16:10					
Client ID:	Run ID: UV-2450_459038		SeqNo: 7835744		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
MBAS	0.537	0.0500	0.5	0	107	85 - 115	0.538	0.186	20
MS	Sample ID: HS24020649-01MS	Units: mg/L 340 MW LAS		Analysis Date: 12-Feb-2024 16:10					
Client ID: OF001 WK 4	Run ID: UV-2450_459038		SeqNo: 7835742		PrepDate: 12-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
MBAS	0.534	0.0500	0.5	0.016	104	80 - 120			
The following samples were analyzed in this batch: HS24020649-01									

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207745 (0)		Instrument: UV-2450		Method: CYANIDE BY SM 4500CN E&G-2011					
MBLK	Sample ID: MBLK-207745	Units: mg/L		Analysis Date: 21-Feb-2024 15:37					
Client ID:	Run ID: UV-2450_459596		SeqNo: 7847849		PrepDate: 21-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	U	0.00500							

LCS	Sample ID: LCS-207745	Units: mg/L		Analysis Date: 21-Feb-2024 15:37					
Client ID:	Run ID: UV-2450_459596		SeqNo: 7847848		PrepDate: 21-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.216	0.00500	0.2	0	108	80 - 120			

MS	Sample ID: HS24020719-01MS	Units: mg/L		Analysis Date: 21-Feb-2024 15:37					
Client ID:	Run ID: UV-2450_459596		SeqNo: 7847846		PrepDate: 21-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.202	0.00500	0.2	0.005	98.5	80 - 120			

MSD	Sample ID: HS24020719-01MSD	Units: mg/L		Analysis Date: 21-Feb-2024 15:37					
Client ID:	Run ID: UV-2450_459596		SeqNo: 7847847		PrepDate: 21-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Cyanide	0.201	0.00500	0.2	0.005	98.0	80 - 120	0.202	0.496	20

The following samples were analyzed in this batch: HS24020649-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK4

WorkOrder:HS24020649

QC BATCH REPORT

Batch ID: 207804 (0)		Instrument: WetChem_HS	Method: TOTAL KJELDAHL NITROGEN (DISS) BY SM4500 NH3 D-11 (DISSOLVED)						
MBLK	Sample ID: MBLK-207804	Units: mg/L		Analysis Date: 22-Feb-2024 10:12					
Client ID:	Run ID: WetChem_HS_459580		SeqNo: 7847438		PrepDate: 22-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		U	0.50						

LCS	Sample ID: LCS-207804	Units: mg/L		Analysis Date: 22-Feb-2024 10:12					
Client ID:	Run ID: WetChem_HS_459580		SeqNo: 7847437		PrepDate: 22-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		20.39	0.50	20	0	102	80 - 120		

MS	Sample ID: HS24020491-02MS	Units: mg/L		Analysis Date: 22-Feb-2024 10:12					
Client ID:	Run ID: WetChem_HS_459580		SeqNo: 7847435		PrepDate: 22-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		19.6	0.50	20	0.398	96.0	75 - 125		

MSD	Sample ID: HS24020491-02MSD	Units: mg/L		Analysis Date: 22-Feb-2024 10:12					
Client ID:	Run ID: WetChem_HS_459580		SeqNo: 7847436		PrepDate: 22-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Total Kjeldahl		18.63	0.50	20	0.398	91.2	75 - 125	19.6	5.09 20

The following samples were analyzed in this batch:HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: 207887 (0)		Instrument: UV-2450		Method: AMMONIA AS N BY SM4500 NH3-B-F-2011					
MBLK	Sample ID: MBLK-207887	Units: mg/L		Analysis Date: 23-Feb-2024 15:44					
Client ID:	Run ID: UV-2450_459726		SeqNo: 7850782		PrepDate: 23-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)		U	0.050						

LCS	Sample ID: LCS-207887	Units: mg/L		Analysis Date: 23-Feb-2024 15:44					
Client ID:	Run ID: UV-2450_459726		SeqNo: 7850781		PrepDate: 23-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)		0.488	0.050	0.5	0	97.6	85 - 115		

MS	Sample ID: HS24020991-01MS	Units: mg/L		Analysis Date: 23-Feb-2024 15:44					
Client ID:	Run ID: UV-2450_459726		SeqNo: 7850779		PrepDate: 23-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)		0.489	0.050	0.5	0.082	81.4	80 - 120		

MSD	Sample ID: HS24020991-01MSD	Units: mg/L		Analysis Date: 23-Feb-2024 15:44					
Client ID:	Run ID: UV-2450_459726		SeqNo: 7850780		PrepDate: 23-Feb-2024		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (as N)		0.489	0.050	0.5	0.082	81.4	80 - 120	0.489	0 20

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458574 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 12-Feb-2024 12:06					
Client ID:	Run ID: ICS-Integrion_458574		SeqNo: 7826326		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	U	0.100							
Chloride	U	0.500							
Fluoride	U	0.100							
Nitrogen, Nitrate (As N)	U	0.100							
Nitrogen, Nitrite (As N)	U	0.100							
Sulfate	U	0.500							

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 12-Feb-2024 12:12					
Client ID:	Run ID: ICS-Integrion_458574		SeqNo: 7826327		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	3.952	0.100	4	0	98.8	90 - 110			
Chloride	19.77	0.500	20	0	98.8	90 - 110			
Fluoride	4.142	0.100	4	0	104	90 - 110			
Nitrogen, Nitrate (As N)	3.953	0.100	4	0	98.8	90 - 110			
Nitrogen, Nitrite (As N)	4.042	0.100	4	0	101	90 - 110			
Sulfate	20.01	0.500	20	0	100	90 - 110			

MS	Sample ID: HS24020570-01MS	Units: mg/L		Analysis Date: 12-Feb-2024 12:30					
Client ID:	Run ID: ICS-Integrion_458574		SeqNo: 7826329		PrepDate:		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromide	16.34	1.00	20	0	81.7	80 - 120			
Chloride	343.2	5.00	100	246.2	96.9	80 - 120			
Fluoride	22.45	1.00	20	1.013	107	80 - 120			
Nitrogen, Nitrate (As N)	20.79	1.00	20	1.888	94.5	80 - 120			
Nitrogen, Nitrite (As N)	18.98	1.00	20	0.042	94.7	80 - 120			
Sulfate	659.8	5.00	100	605.6	54.2	80 - 120			SO

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458574 (0)

Instrument: ICS-Integrion

Method: ANIONS BY E300.0, REV 2.1, 1993

MS	Sample ID: HS24020565-01MS			Units: mg/L		Analysis Date: 12-Feb-2024 14:45			
Client ID:	Run ID: ICS-Integrion_458574			SeqNo: 7826346		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	2.808	0.100	2	0.6333	109	80 - 120			
Chloride	78.16	0.500	10	70.06	81.0	80 - 120			O
Fluoride	2.634	0.100	2	0.6198	101	80 - 120			
Nitrogen, Nitrate (As N)	1.924	0.100	2	0.0352	94.4	80 - 120			
Nitrogen, Nitrite (As N)	1.757	0.100	2	0.0407	85.8	80 - 120			
Sulfate	10.22	0.500	10	0.2864	99.4	80 - 120			

MSD	Sample ID: HS24020570-01MSD			Units: mg/L		Analysis Date: 12-Feb-2024 12:36			
Client ID:	Run ID: ICS-Integrion_458574			SeqNo: 7826330		PrepDate:		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	17.34	1.00	20	0	86.7	80 - 120	16.34	5.95	20
Chloride	342.9	5.00	100	246.2	96.6	80 - 120	343.2	0.0933	20
Fluoride	22.01	1.00	20	1.013	105	80 - 120	22.45	1.99	20
Nitrogen, Nitrate (As N)	20.8	1.00	20	1.888	94.6	80 - 120	20.79	0.0577	20
Nitrogen, Nitrite (As N)	18.9	1.00	20	0.042	94.3	80 - 120	18.98	0.422	20
Sulfate	660.9	5.00	100	605.6	55.2	80 - 120	659.8	0.155	20 SO

MSD	Sample ID: HS24020565-01MSD			Units: mg/L		Analysis Date: 12-Feb-2024 14:51			
Client ID:	Run ID: ICS-Integrion_458574			SeqNo: 7826347		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Bromide	2.861	0.100	2	0.6333	111	80 - 120	2.808	1.89	20
Chloride	78.33	0.500	10	70.06	82.7	80 - 120	78.16	0.222	20
Fluoride	2.65	0.100	2	0.6198	102	80 - 120	2.634	0.613	20
Nitrogen, Nitrate (As N)	1.924	0.100	2	0.0352	94.5	80 - 120	1.924	0.052	20
Nitrogen, Nitrite (As N)	1.761	0.100	2	0.0407	86.0	80 - 120	1.757	0.239	20
Sulfate	10.32	0.500	10	0.2864	100	80 - 120	10.22	0.968	20

The following samples were analyzed in this batch:

HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R458649 (0)		Instrument: Skalar 02		Method: DISSOLVED OXYGEN BY SM4500-O G					
DUP	Sample ID: HS24020731-01DUP	Units: mg/L		Analysis Date: 13-Feb-2024 13:30					
Client ID:	Run ID: Skalar 02_458649		SeqNo: 7827906		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Oxygen, Dissolved	8.44	1.00					8.33	1.31	20
The following samples were analyzed in this batch: HS24020649-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458652 (0)		Instrument: WetChem_HS		Method: RESIDUAL CHLORINE BY SM4500CL F-2011					
MBLK	Sample ID: MBLK-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827828		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	U	0.10							

LCS	Sample ID: LCS-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827827		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.4	0.10	3.66	0	92.9	85 - 115			

LCSD	Sample ID: LCSD-R458652	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID:	Run ID: WetChem_HS_458652		SeqNo: 7827826		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.4	0.10	3.66	0	92.9	85 - 115	3.4	0	20

MS	Sample ID: HS24020649-01MS	Units: mg/L		Analysis Date: 13-Feb-2024 14:20					
Client ID: OF001 WK 4	Run ID: WetChem_HS_458652		SeqNo: 7827829		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chlorine	3.5	0.10	3.66	0.1	92.9	80 - 120			

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458693 (0)		Instrument: WetChem_HS		Method: COLOR BY SM 2120B - 2011					
MBLK	Sample ID: MBLK-R458693	Units: Color Units		Analysis Date: 13-Feb-2024 19:20					
Client ID:	Run ID: WetChem_HS_458693		SeqNo: 7828674		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	U	5.00							
LCS	Sample ID: LCS-R458693	Units: Color Units		Analysis Date: 13-Feb-2024 19:20					
Client ID:	Run ID: WetChem_HS_458693		SeqNo: 7828673		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115			
LCSD	Sample ID: LCSD-R458693	Units: Color Units		Analysis Date: 13-Feb-2024 19:20					
Client ID:	Run ID: WetChem_HS_458693		SeqNo: 7828672		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	50	5.00	50	0	100	85 - 115	50	0	20
DUP	Sample ID: HS24020649-01DUP	Units: Color Units		Analysis Date: 13-Feb-2024 19:20					
Client ID: OF001 WK 4	Run ID: WetChem_HS_458693		SeqNo: 7828675		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Color, Apparent	25	5.00					25	0	20
The following samples were analyzed in this batch: HS24020649-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R458922 (0)		Instrument: WetChem_HS		Method: SULFIDE BY SM4500 S2-F-2011						
MBLK	Sample ID: MBLK-R458922	Units: mg/L		Analysis Date: 15-Feb-2024 14:13						
Client ID:	Run ID: WetChem_HS_458922		SeqNo: 7833370		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	2.00								

LCS	Sample ID: LCS-R458922	Units: mg/L		Analysis Date: 15-Feb-2024 14:13						
Client ID:	Run ID: WetChem_HS_458922		SeqNo: 7833369		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.8	2.00	25	0	87.2	85 - 115				

LCSD	Sample ID: LCSD-R458922	Units: mg/L		Analysis Date: 15-Feb-2024 14:13						
Client ID:	Run ID: WetChem_HS_458922		SeqNo: 7833371		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.6	2.00	25	0	86.4	85 - 115	21.8	0.922	20	

MS	Sample ID: HS24020381-02MS	Units: mg/L		Analysis Date: 15-Feb-2024 14:13						
Client ID:	Run ID: WetChem_HS_458922		SeqNo: 7833372		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.6	2.00	25	-2.6	96.8	80 - 120				

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R459065 (0)		Instrument: WetChem_HS		Method: SULFITE BY SM4500SO3B						
MBLK	Sample ID: MBLK-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836231		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	U	5.00								

LCS	Sample ID: LCS-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836230		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	52	5.00	50	0	104	80 - 120				

LCSD	Sample ID: LCSD-R459065	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID:	Run ID: WetChem_HS_459065		SeqNo: 7836229		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	52	5.00	50	0	104	80 - 120	52	0	20	

MS	Sample ID: HS24020649-01MS	Units: mg/L		Analysis Date: 16-Feb-2024 13:40						
Client ID: OF001 WK 4	Run ID: WetChem_HS_459065		SeqNo: 7836232		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfite	51	5.00	50	3	96.0	75 - 125				

The following samples were analyzed in this batch: HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R459140 (0)		Instrument: TOC_04		Method: TOTAL ORGANIC CARBON - SM5310B-2011						
MBLK	Sample ID: MBLK-02162024	Units: mg/L		Analysis Date: 17-Feb-2024 03:25						
Client ID:	Run ID: TOC_04_459140		SeqNo: 7837844		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	1.00								

LCS	Sample ID: LCS-02162024	Units: mg/L		Analysis Date: 17-Feb-2024 03:38						
Client ID:	Run ID: TOC_04_459140		SeqNo: 7837845		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.1	1.00	10	0	101	85 - 115				

LCSD	Sample ID: LCSD-02162024	Units: mg/L		Analysis Date: 17-Feb-2024 03:51						
Client ID:	Run ID: TOC_04_459140		SeqNo: 7837846		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.23	1.00	10	0	102	85 - 115	10.1	1.28	20	

MS	Sample ID: HS24020402-02MS	Units: mg/L		Analysis Date: 17-Feb-2024 04:16						
Client ID:	Run ID: TOC_04_459140		SeqNo: 7837848		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.26	1.00	10	0.9602	103	80 - 120				

The following samples were analyzed in this batch: HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R459228 (0)		Instrument: Balance1		Method: TOTAL SUSPENDED SOLIDS BY SM 2540D-2011					
MBLK	Sample ID: WMBLK-02152024	Units: mg/L		Analysis Date: 17-Feb-2024 11:00					
Client ID:	Run ID: Balance1_459228		SeqNo: 7840348		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		U	2.50						

LCS	Sample ID: WLCS-02152024	Units: mg/L		Analysis Date: 17-Feb-2024 11:00					
Client ID:	Run ID: Balance1_459228		SeqNo: 7840347		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		95	2.50	100	0	95.0	85 - 115		

DUP	Sample ID: HS24020656-01DUP	Units: mg/L		Analysis Date: 17-Feb-2024 11:00					
Client ID:	Run ID: Balance1_459228		SeqNo: 7840333		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		42.33	2.50				40	5.67	20

DUP	Sample ID: HS24020653-01DUP	Units: mg/L		Analysis Date: 17-Feb-2024 11:00					
Client ID:	Run ID: Balance1_459228		SeqNo: 7840330		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Suspended Solids (Residue, Non-Filterable)		48.33	2.50				44.67	7.89	20

The following samples were analyzed in this batch: HS24020649-01

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal-WK4
HS24020649

QC BATCH REPORT

Batch ID: R459280 (0)		Instrument: WetChem_HS		Method: PH BY SM4500H+ B-2011					
DUP	Sample ID: HS24020773-05DUP		Units: pH Units		Analysis Date: 20-Feb-2024 12:41				
Client ID:	Run ID: WetChem_HS_459280		SeqNo: 7841040		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
pH	6.96	0.100					6.97	0.144	10
Temp Deg C @pH	20	0					20	0	10
The following samples were analyzed in this batch: HS24020649-01									

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R459281 (0)		Instrument:		Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011				
MBLK	Sample ID: WMBLK-0219024	Units: mg/L		Analysis Date: 19-Feb-2024 13:35						
Client ID:	Run ID: Balance1_459281	SeqNo: 7841069		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		U	10.0							
LCS	Sample ID: WLCS-02192024	Units: mg/L		Analysis Date: 19-Feb-2024 13:35						
Client ID:	Run ID: Balance1_459281	SeqNo: 7841068		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		994	10.0	1000	0	99.4	85 - 115			
DUP	Sample ID: HS24020785-01DUP	Units: mg/L		Analysis Date: 19-Feb-2024 13:35						
Client ID:	Run ID: Balance1_459281	SeqNo: 7841057		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		390	10.0				392	0.512	20	
DUP	Sample ID: HS24020649-01DUP	Units: mg/L		Analysis Date: 19-Feb-2024 13:35						
Client ID: OF001 WK 4	Run ID: Balance1_459281	SeqNo: 7841052		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		276	10.0				302	9	20	
The following samples were analyzed in this batch:		HS24020649-01								

Client:ChampionX LLC

Project:2024 Permit Renewal-WK4

WorkOrder:HS24020649

QC BATCH REPORT

Batch ID: R459335 (0)		Instrument: ICS-Integrion		Method: NITRATE/NITRITE BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 21-Feb-2024 00:46					
Client ID:	Run ID: ICS-Integrion_459335		SeqNo: 7842480		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		U	0.200						

LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 21-Feb-2024 00:52					
Client ID:	Run ID: ICS-Integrion_459335		SeqNo: 7842481		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		8.044	0.200	8	0	101	90 - 110		

MS	Sample ID: HS24020649-01MS	Units: mg/L		Analysis Date: 21-Feb-2024 01:04					
Client ID: OF001 WK 4	Run ID: ICS-Integrion_459335		SeqNo: 7842483		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		29.1	1.00	20	11.45	88.3	80 - 120		

MSD	Sample ID: HS24020649-01MSD	Units: mg/L		Analysis Date: 21-Feb-2024 01:10					
Client ID: OF001 WK 4	Run ID: ICS-Integrion_459335		SeqNo: 7842484		PrepDate:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrate/Nitrite (as N)		29.59	1.00	20	11.45	90.7	80 - 120	29.1	1.66 20

The following samples were analyzed in this batch:HS24020649-01

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

QC BATCH REPORT

Batch ID: R459380 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WMBLK-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 07:00						
Client ID:	Run ID: Balance1_459380	SeqNo: 7843444		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	U	2.00								
LCS	Sample ID: LCS-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 07:00						
Client ID:	Run ID: Balance1_459380	SeqNo: 7843442		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40	2.00	40	0	100	78 - 114				
LCSD	Sample ID: LCSD-02212024	Units: mg/L		Analysis Date: 21-Feb-2024 07:00						
Client ID:	Run ID: Balance1_459380	SeqNo: 7843443		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	41.9	2.00	40	0	105	78 - 114	40	4.64	18	
MS	Sample ID: HS24021030-01MS	Units: mg/L		Analysis Date: 21-Feb-2024 07:00						
Client ID:	Run ID: Balance1_459380	SeqNo: 7843438		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.7	2.00	40	1.481	98.0	78 - 114				
The following samples were analyzed in this batch: HS24020649-01										

Client:ChampionX LLC

Project:2024 Permit Renewal-WK4

WorkOrder:HS24020649

QC BATCH REPORT

Batch ID: R459453 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993					
MBLK	Sample ID: MBLK-R459453	Units: mg/L		Analysis Date: 21-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_459453		SeqNo: 7844940		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	U	15.0							

LCS	Sample ID: LCS-R459453	Units: mg/L		Analysis Date: 21-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_459453		SeqNo: 7844939		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	100	15.0	100	0	100	85 - 115			

MS	Sample ID: HS24020491-01MS	Units: mg/L		Analysis Date: 21-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_459453		SeqNo: 7844942		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	64	15.0	50	16	96.0	80 - 120			

MSD	Sample ID: HS24020491-01MSD	Units: mg/L		Analysis Date: 21-Feb-2024 16:00					
Client ID:	Run ID: WetChem_HS_459453		SeqNo: 7844941		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chemical Oxygen Demand	66	15.0	50	16	100	80 - 120	64	3.08	20

The following samples were analyzed in this batch:HS24020649-01

Client:ChampionX LLC

Project:2024 Permit Renewal-WK4

WorkOrder:HS24020649

QC BATCH REPORT

Batch ID: R459651 (0)		Instrument: Skalar 03		Method: ALKALINITY BY -2011					
MBLK	Sample ID: MBLK-02202024	Units: mg/L		Analysis Date: 22-Feb-2024 19:52					
Client ID:	Run ID: Skalar 03_459651	SeqNo: 7849270		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		U	5.00						
LCS	Sample ID: LCS-02202024	Units: mg/L		Analysis Date: 22-Feb-2024 19:59					
Client ID:	Run ID: Skalar 03_459651	SeqNo: 7849271		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		941.3	5.00	1000	0	94.1	85 - 115		
LCSD	Sample ID: LCSD-02202024	Units: mg/L		Analysis Date: 22-Feb-2024 20:06					
Client ID:	Run ID: Skalar 03_459651	SeqNo: 7849272		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		941.5	5.00	1000	0	94.2	85 - 115	941.3	0.0212 20
DUP	Sample ID: HS24020773-05DUP	Units: mg/L		Analysis Date: 22-Feb-2024 21:53					
Client ID:	Run ID: Skalar 03_459651	SeqNo: 7849289		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Total (As CaCO3)		711.5	5.00					715.7	0.589 20
The following samples were analyzed in this batch:		HS24020649-01							

Client: ChampionX LLC
Project: 2024 Permit Renewal-WK4
WorkOrder: HS24020649

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L22-90-R2	31-Mar-2024
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024



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Chain of Custody Form

Page ____ of ____

COC ID: 312466

HS24020649

ChampionX LLC
2024 Permit Renewal-WK4



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	450443658	Project Name	2024 Permit Renewal
Work Order		Project Number	
Company Name	Nalco Company	Bill To Company	ChampionX LLC
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380
Address	PO Box 2167	Address	PO Box 2167
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542
Phone	(979) 239-5800	Phone	(979) 239-5800
Fax	(979) 233-6767	Fax	(979) 233-6767
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com

A	PCB 608, SVOC 625, VOC 624/8260_W
B	200.8 (Metals), 8015 (Amines)
C	BOD, CBOD, 300_W(NO3,SO4,Cl,F, Br), pH/Color
D	COD, TOC, TON (Ammonia, TKN), CN_TW
E	O&G, Total Phosphorus, Sulfide, Surfactants
F	TSS, TDS, ALK, Cr3_W, DO, Sulfite, Res Chlorine
G	Sub E.Coli and Enterococci to Envirodyne
H	Available Cyanide (Sub to Holland, MI)
I	Low level Mercury (Sub to Holland, MI)
J	Low Level HexChrome (Sub to ESC)/Sub Formaldehyde A&B

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF 001 WK4	2/12/24	0705	W		7	X										
2	OF 001 WK4	2/12/24	0706	W		4		X									
3	OF 001 WK4	2/12/24	0708	W		4			X								
4	OF 001 WK4	2/12/24	0712	W		5				X							
5	OF 001 WK4	2/12/24	0712	W		4					X						
6	OF 001 WK4	2/12/24	0745	W		4						X					
7	OF 001 WK4	2/12/24	0708	W		4							X				
8	OF 001 WK4	2/12/24	0745	W		1								X			
9	OF 001 WK4	2/12/24	0748	W		13									X		
10	OF 001 WK4	2/12/24	0745	W		3										X	

Sampler(s) Please Print & Sign Marcy Putnam		Shipment Method PLU/ALS		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:	
Relinquished by: D-2	Date: 2-12-24	Time: 1115	Received by: D-2	Notes: Annual Permit Renewal					
Relinquished by: D-2	Date: 2-12-24	Time: 7305	Received by (Laboratory): D-2	Cooler ID Red	Cooler Temp. N/C	QC Package: (Check One Box Below)			
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):			<input checked="" type="checkbox"/> Level II Std QC	<input type="checkbox"/> TRRP Checklist		
						<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV		
						<input type="checkbox"/> Level IV SW846/CLP			
						Other			

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.



right solutions.
right partner.

February 22, 2024

Andrew Neir
ALS Environmental
10450 Stancliff Rd
Suite 210
Houston, TX 77099

Re: **HS24020649**

Work Order: **HN2400293**

Dear Andrew,
Enclosed are the results of the sample(s) submitted to our laboratory.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to contact me:
ADDRESS: 3352 128th Avenue, Holland, MI, USA PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Chelsey Cook

/S/ Chelsey Cook

Project Manager



Narrative Documents

Client: ALS Environmental
Project: HS24020649
Sample Matrix: Water

Work Order: HN2400293
Date Received: 13-Feb-2024

CASE NARRATIVE

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 13-Feb-2024. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Inorganics:

No significant anomalies were noted with this analysis.



Sample Receipt Information

SAMPLE SUMMARY



Client: ALS Environmental
Project: HS24020649
Workorder: HN2400293

Laboratory Sample ID	Client Sample ID	Sample Matrix	Collection Date	Date Received
HN2400293-001	OF001 WK 4	WATER	02/12/24 07:05	02/13/24 09:30
HN2400293-002	LL Hg Duplicate	WATER	02/12/24 07:05	02/13/24 09:30
HN2400293-003	LL Hg Field Blank	WATER	02/12/24 07:05	02/13/24 09:30



Environmental Division
Holland
Work Order Reference
HN2400293



Telephone : +1 616 399 6070

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract

SAMPLING STATE: Texas

COC ID: 24721

SUBCONTRACT TO:

ALS Laboratory Group
3352 128th Ave.
Holland, MI 494249263

Phone: +1 616 399 6070

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020649
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS24020649-01	OF001 WK 4	Water	12 Feb 2024 07:05
	SUB_Available Cyanide			23 Feb 2024
	Sub_MercuryLow			23 Feb 2024
2.	HS24020649-02	LL Hg Duplicate	Water	12 Feb 2024 07:05
	Sub_MercuryLow			23 Feb 2024
3.	HS24020649-03	LL Hg Field Blank	Water	12 Feb 2024 07:05
	Sub_MercuryLow			23 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:

Received By:

Cooler ID(s):

Date/Time:

Date/Time:

Temperature(s):

2/12/24 1800.

2524050

28.15

RIGHT SOLUTIONS | RIGHT PARTNER



10450 Standcliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Purchase Order

PO: HS24020649

VENDOR:

ALS Laboratory Group
3352 128th Ave.
Holland, MI 494249263

Phone: +1 616 399 6070

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: 24721
TSR: Houston House Acct

Item	Catalog No	Unit Price	Quantity	Ext Price
1. SUB_Available Cyanide	NA	\$33.75	1	\$33.75
2. Sub_MercuryLow	NA	\$67.50	3	\$202.50
Order Total:				\$236.25



ALS Holland Sample Receiving Checklist

Received by: SDDate/Time: 2-15-24 0930Carrier Name: SelexShipping container/cooler in good condition? Yes / No / Not PresentCustody seals intact on shipping container/cooler? Yes / No / Not PresentCustody seals intact on sample bottles? Yes / No / Not PresentChain of Custody present? Yes / NoCOC signed when relinquished and received? Yes / NoCOC agrees with sample labels? Yes / NoSamples in proper container/bottle? Yes / NoSample containers intact? Yes / NoSufficient sample volume for indicated test? Yes / NoAll samples received within holding time? Yes / NoContainer/Temp Blank temperature in compliance? Yes / NoTemperature(s) (°C): 25.38 CThermometer(s): 713Sample(s) received on ice? Yes / NoMatrix/Matrices: Water

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 2-15-24 091450Water – VOA vials have zero headspace? Yes / No / No VialsWater – pH acceptable upon receipt? Yes / No / N/A

pH strip lot #: _____ < 2 _____ > 12 _____ Other _____

pH adjusted (note adjustments below)? Yes / No / N/A

pH adjusted by: _____

Login Notes:



Miscellaneous Forms

REPORT QUALIFIERS AND DEFINITIONS

*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Holland Laboratory Certifications

Agency	Type	ID	Issued	Expires
Alabama	Drinking Water (Secondary)	42500	1/1/2024	12/31/2024
Colorado	UST		1/1/2024	6/30/2024
Connecticut	Drinking Water (Secondary)	PH-0155	1/23/2023	12/31/2024
Florida	NELAP (Primary)	E871106	6/28/2023	6/30/2024
Illinois	NELAP (Secondary)	200076	12/14/2023	12/31/2024
Indiana	Drinking Water (Secondary)	C-MI-08	7/6/2021	12/31/2023
Iowa	State Specific	403	9/18/2023	9/1/2025
Kansas	NELAP (Secondary)	E-10411	7/26/2023	7/31/2024
Kentucky	Waste Water	KY98004	12/5/2023	12/31/2024
Kentucky	UST	120474	7/6/2023	6/30/2024
Michigan	Drinking Water (Primary)	0022	12/19/2023	9/4/2026
Minnesota	NELAP (Secondary)	026-999-449	12/29/2023	12/31/2024
New Jersey	NELAP (Secondary)	MI015	6/5/2023	6/30/2024
New York	Drinking Water (Secondary)	12128	4/1/2023	4/1/2024
North Dakota	State Specific	R-192	9/12/2023	6/30/2024
Ohio	Drinking Water (Secondary)	87783	7/5/2023	6/30/2024
Pennsylvania	NELAP (Secondary)	68-03827	12/21/23	7/31/2024
Texas	NELAP (Secondary)	T104704494	2/1/2024	1/31/2025
USDA	Domestic CA	Soil-MI-007	8/21/2023	2/18/2025
USDA	Soil Import	P330-19-00039	3/3/2023	3/3/2026
West Virginia	State Specific	355	8/25/2023	8/31/2024
Wisconsin	State Specific	399084510	8/11/2023	8/31/2024

ANALYST SUMMARY



Client: ALS Environmental
Project: HS24020649

Work Order: HN2400293

Sample Name: OF001 WK 4
Laboratory Code: HN2400293-001
Sample Matrix: WATER

Date Collected: 02/12/24
Date Received: 02/13/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1335933	Kate Achatz	2068889	Kate Achatz
OIA 1677	1332384	Mike Burkall	2062693	Mike Burkall

Sample Name: LL Hg Duplicate
Laboratory Code: HN2400293-002
Sample Matrix: WATER

Date Collected: 02/12/24
Date Received: 02/13/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1335933	Kate Achatz	2068889	Kate Achatz

Sample Name: LL Hg Field Blank
Laboratory Code: HN2400293-003
Sample Matrix: WATER

Date Collected: 02/12/24
Date Received: 02/13/24

Analysis Method	Preparation Lot	Prepared By	Analysis Lot	Analyzed By
EPA 1631E	1335933	Kate Achatz	2068889	Kate Achatz



Sample Results



Metals

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Work Order: HN2400293
Date Collected: 02/12/24 07:05
Date Received: 02/13/24 09:30

Sample Name: OF001 WK 4
Laboratory Code: HN2400293-001

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 18:06	02/16/24 18:06	

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Work Order: HN2400293
Date Collected: 02/12/24 07:05
Date Received: 02/13/24 09:30

Sample Name: LL Hg Duplicate
Laboratory Code: HN2400293-002

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 18:14	02/16/24 18:06	

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Work Order: HN2400293
Date Collected: 02/12/24 07:05
Date Received: 02/13/24 09:30

Sample Name: LL Hg Field Blank
Laboratory Code: HN2400293-003

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 18:22	02/16/24 18:06	



General Chemistry

Analytical Report

Client: ALS Environmental

Project: HS24020649/

Sample Matrix: WATER

Sample Name: OF001 WK 4

Laboratory Code: HN2400293-001

Work Order: HN2400293

Date Collected: 02/12/24 07:05

Date Received: 02/13/24 09:30

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Free Cyanide	OIA 1677	<2.00 U	µg/L	2.00	1	02/14/24 16:32	02/14/24 13:18	



QC Summary Forms



Metals

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1335933-001

Work Order: HN2400293
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 16:09	02/16/24 18:07	

Analytical Report

Client: ALS Environmental

Project: HS24020649/

Sample Matrix: WATER

Sample Name: Method Blank

Laboratory Code: QC-1335933-002

Work Order: HN2400293

Date Collected: NA

Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 16:56	02/16/24 18:07	

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1335933-003

Work Order: HN2400293
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 17:43	02/16/24 18:07	

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Sample Name: Method Blank
Laboratory Code: QC-1335933-004

Work Order: HN2400293
Date Collected: NA
Date Received: NA

Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	EPA 1631E	<0.500 U	ng/L	0.500	1	02/19/24 18:29	02/16/24 18:07	

QA/QC Report

Client: ALS Environmental
Project: HS24020649
Sample Matrix: WATER

Work Order:HN2400293
Date Analyzed:02/19/2024
Date Extracted:02/16/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2068889

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1335933-005	5.13	5	103	77-123

QA/QC Report

Client: ALS Environmental
Project: HS24020649
Sample Matrix: WATER

Work Order:HN2400293
Date Analyzed:02/19/2024
Date Extracted:02/16/2024

Laboratory Control Sample Summary
Mercury

Analysis Method: EPA 1631E
Prep Method: Method

Units:ng/L
Analysis Lab Lot:2068889

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1335933-006	5.17	5	103	77-123



General Chemistry

Analytical Report

Client: ALS Environmental
Project: HS24020649/
Sample Matrix: WATER

Work Order: HN2400293

Date Collected: NA

Date Received: NA

Sample Name: Method Blank
Laboratory Code: QC-1332384-001

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Free Cyanide	OIA 1677	<2.00 U	µg/L	2.00	1	02/14/24 16:33	02/14/24 13:19	

QA/QC Report

Client: ALS Environmental
Project: HS24020649
Sample Matrix: WATER

Work Order:HN2400293
Date Analyzed:02/14/2024
Date Extracted:02/14/2024

Laboratory Control Sample Summary
Free Cyanide

Analysis Method: OIA 1677
Prep Method: Method

Units:µg/L
Analysis Lab Lot:2062693

Sample Name	Laboratory Code	Result	Spike Amount	% Rec	% Rec Limits
Laboratory Control Sample	QC-1332384-002	47.0	50	93.9	82-132

Laboratory Analysis Report

Total Number of Pages: 6

Job ID : 24021373



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

Client Project Name : HS24020649

Report To :	Client Name:	ALS Group USA, Corp.	P.O.#:
	Attn:	Andy C. Neir	Sample Collected By:
	Client Address:	10450 Stancliff Rd., Ste. 210	Date Collected: 02/12/24
	City, State, Zip:	Houston, Texas, 77099	

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
HS24020649-01 / OF001 Wk 4	Water	24021373.01

A handwritten signature in black ink, appearing to read 'S. C. Wk'.

Released By: Senthilkumar Sevukan
Title: Vice President Operations
Date: 2/20/2024



This Laboratory is NELAP (T104704213-23-31) accredited. Effective: 04/13/2023; Expires: 3/31/2024
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Results apply to the sample as received. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

ab-q210-0321

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 24021373

Date: 2/20/2024

General Term Definition

Back-Wt	Back Weight	MQL	Unadjusted Minimum Quantitation Limit
BRL	Below Reporting Limit	Post-Wt	Post Weight
cfu	colony-forming units	ppm	parts per million
Conc.	Concentration	Pre-Wt	Previous Weight
D.F.	Dilution Factor	Q	Qualifier
Front-Wt	Front Weight	RegLimit	Regulatory Limit
J	Estimation. Below calibration range but above MDL	RPD	Relative Percent Difference
LCS	Laboratory Check Standard	RptLimit	Reporting Limit
LCSD	Laboratory Check Standard Duplicate	SDL	Sample Detection Limit
LOD	Limit of detection adjusted for %M + DF	surr	Surrogate
LOQ	Limit of Quantitation adjusted for %M + DF	T	Time
MS	Matrix Spike	TNTC	Too numerous to count
MSD	Matrix Spike Duplicate	UQL	Unadjusted Upper Quantitation Limit
MW	Molecular Weight		

Qualifier Definition

M2	Matrix Spike and/or Matrix Spike Duplicate recovery is below laboratory control limits due to matrix interference.
----	--

**LABORATORY TEST RESULTS**

Job ID : 24021373

Date 2/20/2024

Client Name: ALS Group USA, Corp.

Attn: Andy C. Neir

Project Name: HS24020649

Client Sample ID: HS24020649-01 / OF001 Wk 4

Job Sample ID: 24021373.01

Date Collected: 02/12/24

Sample Matrix Water

Time Collected: 07:05

Other Information:

Test Method	Parameter/Test Description	Result	Units	DF	Rpt Limit	Reg Limit	Q	Date Time	Analyst
SW-846 8315A	Aldehydes by HPLC								
	Formaldehyde	BRL	mg/L	1.00	0.04			02/15/24 17:46	ARM

QUALITY CONTROL CERTIFICATE



Job ID : 24021373

Date : 2/20/2024

Analysis : Aldehydes by HPLC Method : SW-846 8315A Reporting Units : mg/L

QC Batch ID : Qb24021630 Created Date : 02/15/24 Created By : AMarapadaga

Samples in This QC Batch : 24021373.01

Extraction : PB24021559 Prep Method : SW-846 8315A Prep Date : 02/15/24 07:00 Prep By : Msoria

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	RptLimit	Qual
Formaldehyde	50-00-0	BRL	mg/L	1.00	0.04	

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
Formaldehyde	0.12	0.126	105	0.12	0.126	105	0.4	35	36-140	

QC Type: MS and MSD

QC Sample ID: 24021373.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Formaldehyde	BRL	0.12	0	0						10-160	M2



Job ID:24021373



02/13/2024

ALS Group USA, Corp. ACH

10450 Stancliff Rd, Ste 210

Houston, TX 77099

T: +1 281 530 5656

F: +1 281 530 5887

www.alsglobal.com

Subcontract Chain of Custody**SAMPLING STATE:** Texas**COC ID:** 24731**SUBCONTRACT TO:**

A&B Environmental
10100 East Freeway, Ste 100
Houston, TX 77029

Phone: +1 713 453 6060**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020649
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24020649-01	OF001 WK 4	Water	12 Feb 2024 07:05
SUB_FORMALDEHYDE			23 Feb 2024 OIA

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By:

Date/Time:

2/13/24 13:20

Received By:

Date/Time:

2/13/24 13:20

Cooler ID(s):

Temperature(s):

3.4°C 1P5



Sample Condition Checklist

A&B JobID : 24021373		Date Received : 02/13/2024		Time Received : 1:20PM								
Client Name : ALS Group USA, Corp.												
Temperature : 3.4°C		Sample pH : NA										
Thermometer ID : IR5		pH Paper ID : NA										
Perservative :		Lot# :										
	Check Points				Yes	No	N/A					
1.	Cooler Seal present and signed.					X						
2.	Sample(s) in a cooler.				X							
3.	If yes, ice in cooler.				X							
4.	Sample(s) received with chain-of-custody.				X							
5.	C-O-C signed and dated.				X							
6.	Sample(s) received with signed sample custody seal.					X						
7.	Sample containers arrived intact. (If No comment)				X							
8.	Matrix:	Water	Soil	Liquid	Sludge	Solid	Cassette	Tube	Bulk	Badge	Food	Other
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Samples were received in appropriate container(s)				X							
10.	Sample(s) were received with Proper preservative						X					
11.	All samples were tagged or labeled.				X							
12.	Sample ID labels match C-O-C ID's.				X							
13.	Bottle count on C-O-C matches bottles found.				X							
14.	Sample volume is sufficient for analyses requested.				X							
15.	Samples were received with in the hold time.				X							
16.	VOA vials completely filled.						X					
17.	Sample accepted.				X							
18.	Has client been contacted about sub-out						X					

Comments : Include actions taken to resolve discrepancies/problem:

--

Brought by : Client
Received by : ASmith

Check in by/date : ASmith / 02/13/2024

ab-s005-1123

ALS Environmental - Houston, TX

Sample Delivery Group: L1704992

Samples Received: 02/13/2024

Project Number:

Description:

Report To: Andy Neir
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Entire Report Reviewed By:



Cassandra Foster
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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RIGHT SOLUTIONS | RIGHT PARTNER

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SAMPLE SUMMARY

OF001 WK 4 L1704992-01 WW

Collected by

Collected date/time

Received date/time

02/12/24 07:05

02/13/24 14:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 218.6M	WG2224853	1	02/14/24 02:47	02/14/24 02:47	VSS	Mt. Juliet, TN

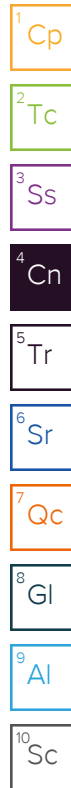
¹Cp ${}^2\text{Tc}$ 3S_s ${}^4\text{Cn}$ ${}^5\text{Tr}$ ${}^6\text{Sr}$ ${}^7\text{Qc}$ ${}^8\text{Gf}$ ${}^9\text{Al}$ ^{10}Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Cassandra Foster
Project Manager



Laboratory Data Package Cover Page

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
 - a. Items consistent with NELAC Chapter 5,
 - b. dilution factors,
 - c. preparation methods,
 - d. cleanup methods, and
 - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
 - a. Calculated recovery (%R), and
 - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
 - a. LCS spiking amounts,
 - b. Calculated %R for each analyte, and
 - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - a. Samples associated with the MS/MSD clearly identified,
 - b. MS/MSD spiking amounts,
 - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d. Calculated %Rs and relative percent differences (RPDs), and
 - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
 - a. The amount of analyte measured in the duplicate,
 - b. The calculated RPD, and
 - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.



Cassandra Foster
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National			LRC Date: 02/14/2024 13:28				
Project Name:			Laboratory Job Number: L1704992-01				
Reviewer Name: Cassandra Foster			Prep Batch Number(s): WG2224853				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National			LRC Date: 02/14/2024 13:28				
Project Name:			Laboratory Job Number: L1704992-01				
Reviewer Name: Cassandra Foster			Prep Batch Number(s): WG2224853				
# ¹	A ²	Description	Yes	No	NA ³	NR ⁴	ER# ⁵
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?			X		
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National		LRC Date: 02/14/2024 13:28	
Project Name:		Laboratory Job Number: L1704992-01	
Reviewer Name: Cassandra Foster		Prep Batch Number(s): WG2224853	
ER # ¹	Description		
The Exception Report intentionally left blank, there are no exceptions applied to this SDG.			
1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period. 2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable); 3. NA = Not applicable; 4. NR = Not reviewed; 5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).			

Wet Chemistry by Method 218.6M

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Hexavalent Chromium	U		0.000150	0.000500	0.000500	1	02/14/2024 02:47	WG2224853

- 1Cp
- 2Tc
- 3Ss
- 4Cn
- 5Tr
- 6Sr
- 7Qc
- 8Gl
- 9Al
- 10Sc

Method Blank (MB)

(MB) R4033408-1 02/13/24 23:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexavalent Chromium	U		0.000150	0.000500

L1704670-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1704670-01 02/14/24 00:27 • (DUP) R4033408-5 02/14/24 00:38

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP RPD Limits %
Hexavalent Chromium	U	U	1	0.000	20

L1705025-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1705025-01 02/14/24 02:58 • (DUP) R4033408-7 02/14/24 03:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP RPD Limits %
Hexavalent Chromium	U	U	1	0.000	20

Laboratory Control Sample (LCS)

(LCS) R4033408-2 02/13/24 23:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	0.00200	0.00219	109	90.0-110	

L1704445-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1704445-11 02/13/24 23:43 • (MS) R4033408-3 02/13/24 23:54 • (MSD) R4033408-4 02/14/24 00:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	0.0500	0.00211	0.0525	0.0528	101	101	1	90.0-110			0.655	20

L1704906-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1704906-01 02/14/24 00:49 • (MS) R4033408-6 02/14/24 01:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	0.0500	0.00186	0.0519	100	1	90.0-110	

1Cp

2Tc

3Ss

4Cn

5Tr

6Sr

7Qc

8Gl

9Al

10Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

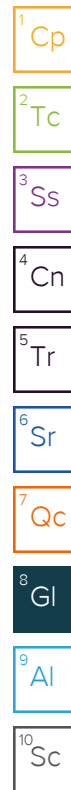
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.



ACCREDITATIONS & LOCATIONS

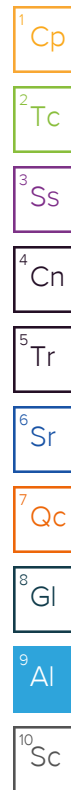
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

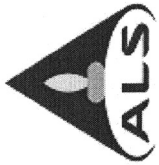
Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





10450 Standcliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

E094

SAMPLING STATE: Texas

COC ID: 24725

SUBCONTRACT TO:

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

L1704992

Phone: +1 (61) 7 8-58

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

78

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Standcliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020649
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE

1. HS24020649-01 OF001 WK 4 Water 12 Feb 2024 07:05 23 Feb 2024 91

Low-level 218.6-ESC

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

270-279 0018
Sample Receipt Checklist
COC Seal Present/Intact: Y N If Applicable
COC Signed/Accurate: Y N VOA Zero Headspace: Y N
Bottles arrive intact: Y N Pres. Correct/Check: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
PA Screen <0.5 mR/hr: Y N
6862 0002 1120

Relinquished By:

Received By:

Cooler ID(s):

Date/Time:

Date/Time:

Temperature(s):

2/12/24 1800

2-17-24 0900

9K



Project
1091466

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed 02/21/2024
16:34

TABLE OF CONTENTS

This report consists of this Table of Contents and the following pages:

Report Name	Description	Pages
1091466_r02_01_ProjectSamples	SPL Kilgore Project P:1091466 C:ALS8 Project Sample Cross Reference t:304	1
1091466_r03_03_ProjectResults	SPL Kilgore Project P:1091466 C:ALS8 Project Results t:304	2
1091466_r10_05_ProjectQC	SPL Kilgore Project P:1091466 C:ALS8 Project Quality Control Groups	1
1091466_r99_09_CoC__1_of_1	SPL Kilgore CoC ALS8 1091466_1_of_1	4
Total Pages:		8



SAMPLE CROSS REFERENCE

Project

1091466

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed

2/21/2024

Page 1 of 1

Sample	Sample ID	Taken	Time	Received
2272188	HS24020649-01 OF001 WK 4	02/12/2024	07:05:00	02/13/2024

Bottle 01 client supplied 40 ml glass vial(zero headspace)
Bottle 02 client supplied 40 ml glass vial(zero headspace)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 1671	01	1105088	02/19/2024	1105088	02/19/2024

Email: Kilgore.projectmanager@spl-inc.com



ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Page 1 of 2

Project

1091466

Printed: 02/21/2024

RESULTS

Sample Results

2272188	HS24020649-01 OF001 WK 4	Received:	02/13/2024
Non-Potable Water	Collected by: Client	ALS Group USA Corp.	PO:
	Taken: 02/12/2024	07:05:00	

EPA 1671		Prepared:	1105088	02/19/2024	20:46:00	Analyzed	1105088	02/19/2024	20:46:00	KAP
	Parameter	Results	Units	RL		Flags	CAS			Bottle
z	Diethylamine	<50.0	mg/L	50.0			109-89-7			01
z	Dimethylamine	<50.0	mg/L	50.0		D	124-40-3			01
z	Methylamine	<500	mg/L	500		XD	74-89-5			01
z	Trimethylamine	<500	mg/L	500			75-50-3			01

Sample Preparation

2272188	HS24020649-01 OF001 WK 4	Received:	02/13/2024
	02/12/2024		

		Prepared:	02/13/2024	16:33:34	Calculated	02/13/2024	16:33:34	CAL
z	Environmental Fee (per Project)	Verified						
	Cooler Return	Prepared:	02/15/2024	16:00:00	Analyzed	02/15/2024	16:00:00	DRS
z	Return Cooler/No bottles Require	returned						

EPA 1671		Prepared:	1105088	02/19/2024	20:46:00	Analyzed	1105088	02/19/2024	20:46:00	KAP
z	Amines by 1671	Entered								01



2600 Dudley Rd. Kilgore, Texas 75662
24 Waterway Avenue, Suite 375 The Woodlands, TX 77380
Office: 903-984-0551 * Fax: 903-984-5914



1
2

ALS8-G

Page 2 of 2

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project
1091466

Printed: 02/21/2024

Qualifiers:

D - Duplicate RPD was higher than expected X - Standard reads higher than desired.

We report results on an As Received (or Wet) basis unless marked Dry Weight.

Unless otherwise noted, testing was performed at SPL, Inc.- Kilgore laboratory which holds International, Federal, and state accreditations. Please see our Websites for details.

(N)ELAC - Covered in our NELAC scope of accreditation
z -- Not covered by our NELAC scope of accreditation

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of SPL Kilgore. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.


Bill Peery, MS, VP Technical Services



QUALITY CONTROL

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project
1091466

Printed 02/21/2024

Analytical Set **1105088**

EPA 1671

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Diethylamine	1105088	ND	25.0	50.0	mg/L	126003745
Dimethylamine	1105088	ND	50.0	50.0	mg/L	126003745
Methylamine	1105088	ND	500	500	mg/L	126003745
Trimethylamine	1105088	ND	500	500	mg/L	126003745

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Diethylamine	1190	1000	mg/L	119	60.0 - 140	126003744
Diethylamine	1010	1000	mg/L	101	60.0 - 140	126003753
Dimethylamine	1230	1000	mg/L	123	60.0 - 140	126003744
Dimethylamine	795	1000	mg/L	79.5	60.0 - 140	126003753
Methylamine	972	1000	mg/L	97.2	60.0 - 140	126003744
Methylamine	2040	1000	mg/L	204	60.0 - 140 *	126003753
Trimethylamine	998	1000	mg/L	99.8	60.0 - 140	126003744
Trimethylamine	1140	1000	mg/L	114	60.0 - 140	126003753

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Diethylamine	2272188	1050	789	ND	1000	50.0 - 150	105	78.9	mg/L	28.4	30.0
Dimethylamine	2272188	747	1090	ND	1000	50.0 - 130	74.7	109	mg/L	37.3 *	30.0
Methylamine	2272188	703	1110	ND	1000	50.0 - 130	70.3	111	mg/L	44.9 *	30.0
Trimethylamine	2272188	1010	1100	ND	1000	50.0 - 130	101	110	mg/L	8.53	30.0

* Out RPD is Relative Percent Difference: $\text{abs}(r1-r2) / \text{mean}(r1,r2) * 100\%$

Recover% is Recovery Percent: $\text{result} / \text{known} * 100\%$

Blank - Method Blank (reagent water or other blank matrices that contains all reagents except standard(s) and is processed simultaneously with and under the same conditions as samples; carried through preparation and analytical procedures exactly like a sample; monitors); CCV - Continuing Calibration Verification (same standard used to prepare the curve; typically a mid-range concentration; verifies the continued validity of the calibration curve); MSD - Matrix Spike Duplicate (replicate of the matrix spike; same solution and amount of target analyte added to the MS is added to a third aliquot of sample; quantifies matrix bias and precision.)



1091466 CoC Print Group 001 of 001



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24728

SUBCONTRACT TO:

SPL
2600 Dudley Rd
Kilgore, TX 75662

2272188

Phone: +1 903 984 0551

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020649
TSR: Houston House Acct

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS24020649-01	OF001 WK 4	Water	12 Feb 2024 07:05
See Quote attched			23 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

See Attached to
Tracking # and Temp.

Relinquished By:

Date/Time:

2/12/24 1800

Received By:

Date/Time:

2/13/24 1030

Cooler ID(s):

Kathy Tarver SPL, Inc.

Temperature(s):

1091466 CoC Print Group 001 of 001

2600 Dudley Rd. Kilgore, Texas 75662
 24 Waterway Avenue, Suite 375 The Woodlands, TX 77380
 Office: 903-984-0551 * Fax: 903-984-5914



SPL
 The Science of Sure

Printed 01/29/2024 Page 1 of 1

COC REPORTING LIMITS

(ug/L)

Test	Name	MDL	SQL	Target/MAL	Method
109	Amines				Non-Potable Water
TCEQ Wastewater 2010 MALs (RG-194, Jan 2012)					

IFWA

!Dea	Diethylamine	25000	50000	50000	EPA 1671 CAS:109-89-7
!Dma	Dimethylamine	50000	50000	50000	EPA 1671 CAS:124-40-3
!Mma	Methylamine	500000	500000	50000 *	EPA 1671 CAS:74-89-5
!Tma	Trimethylamine	500000	500000		EPA 1671 CAS:75-50-3

Achievable reporting limits may vary with dilutions in accord with the sample matrix and listed method requirements

SQL is the Method Quantitation Limit and corresponds to a low standard
 SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)
 MAL is minimum analytical limit and is the selected target limit

COC is Chain of Custody
 MDL is Method Detection Limit (40 CFR 136 Appendix B)
 ug/L is micrograms per liter

1
2
3
4

4 of 4

1091466 CoC Print Group 001 of 001



Must Deliver Next Business Day
Time and Temperature Sensitive!

Part # 1091466-001 M/W EXP 10/24 **

ORIGIN ID: SCRA (281) 530-5656
SAMPLE RECEIVING
ALS GROUP USA, CORP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12FEB24
ACTWGT: 5.25 LB
CAD: 0221247/CAFE3755

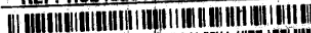
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
SPL - KILGORE
2600 DUDLEY RD

KILGORE TX 75662

(800) 984-0551

REF: HS24020181/649 - AN



FedEx
Express



TRK# 6862 6802 1193
0201

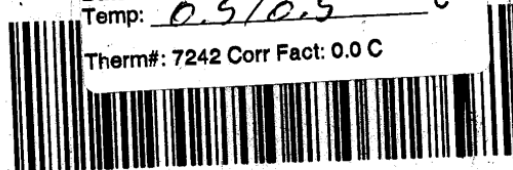
TUE - 13 FEB 10:30A
PRIORITY OVERNIGHT

AH

2/13/2025 KT
Date Time Tech
Temp: 0.570.5 C

5662
SHV

Therm#: 7242 Corr Fact: 0.0 C



Report Page 9 of 9



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

29 February 2024

ALS Group USA, Corp.
Attn: Accounts Payable
10450 Stancliff Rd. Suite #210
Houston, TX 77099

ALS

Enclosed are the results of analyses for samples received by the laboratory on 12-Feb-24 14:00. The analytical data provided relates only to the samples as received in this laboratory report.

ELI certifies that all results are NELAP compliant and performed in accordance with the referenced method except as noted in the Case Narrative or as noted with a qualifier. Any reproductions of this laboratory report should be in full and only with the written authorization from the client.

The total number of pages in this report is 5

Thank you for selecting ELI for your analytical needs. If you have any questions regarding this report, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read 'Julie Peterson'.

Julie Peterson
Client Services Representative



Certificate No: T104704265-22-20



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B1580

Reported:
29-Feb-24 16:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HS24020649-01 OF001 Wk4	24B1580-01	Water	12-Feb-24 07:05	12-Feb-24 14:00

Envirodyne Laboratories, Inc.

A handwritten signature in black ink, appearing to read 'Julie Peterson', is written over a horizontal line.

Julie Peterson, Client Services Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B1580

Reported:
29-Feb-24 16:10

HS24020649-01 OF001 Wk4
24B1580-01 (Water) Sampled: 12-Feb-24 07:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Analyst	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	---------	-------

Envirodyne Laboratories, Inc.

Microbiology

E.coli	30	10	MPN/100 mL	10	B4B4321	12-Feb-24	12-Feb-24 15:04	SM9223 B	LN	
Enterococci	10	10	MPN/100 mL	10	B4B4272	12-Feb-24	12-Feb-24 15:10	Enterolert	LN	H

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Julie Peterson, Client Services Representative



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B1580

Reported:
29-Feb-24 16:10

Microbiology - Quality Control
Envirodyne Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	----------------	--------------	-------

Batch B4B4272 - Microbiology

Blank (B4B4272-BLK1) Prepared & Analyzed: 12-Feb-24

Enterococci <1 1 MPN/100 mL

Duplicate (B4B4272-DUP1) Source: 24B1582-01 Prepared & Analyzed: 12-Feb-24

Enterococci <10 10 MPN/100 mL 90.0 0.5366

Batch B4B4321 - Microbiology

Blank (B4B4321-BLK1) Prepared & Analyzed: 12-Feb-24

E.coli <1 1 MPN/100 mL

Duplicate (B4B4321-DUP1) Source: 24B1080-01 Prepared & Analyzed: 12-Feb-24

E.coli <2 2 MPN/100 mL 4840 0.00 0.402

Envirodyne Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Julie Peterson, Client Services Representative



Envirodyne Laboratories, Inc
11011 Brooklet Dr., # 230
Houston, TX 77099
281.568.7880 Phone
www.envirodyne.com

Client: ALS Group USA, Corp.
Project: ALS
Work Order: 24B1580

Reported:
29-Feb-24 16:10

Notes and Definitions

H Hold time exceeded
> > 2420
ND Analyte NOT DETECTED at or above the reporting limit
< Result is less than the RL
a Analyte not available for TNI/NELAP accreditation
n Not accredited

Envirodyne Laboratories, Inc.

Julie Peterson, Client Services Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



24B1580

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas**COC ID:** 24720**SUBCONTRACT TO:**

Envirodyne Laboratories, Inc.
11011 Brooklet, Ste 230
Houston, TX 77099

Phone: +1 281 568 7880**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
**Alternate
Contact:** Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

**INVOICE
INFORMATION:**

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24020649
TSR: Houston House Acct

1.	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	HS24020649-01	OF001 WK 4	Water	12 Feb 2024 07:05
	SUB_E. Coli			23 Feb 2024
	SUB_Enterococci			23 Feb 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: D. J. [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 2-12-24 1400
Date/Time: 2/12/24 1400
Temperature(s): 3.1/2.9 1Rth

RIGHT SOLUTIONS | RIGHT PARTNER

17 Feb 2024

Page 1 of 1



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 07, 2024

Andy Slater
ChampionX LLC
PO Box 2167
Freeport, TX 77542

Work Order: **HS24021510**

Laboratory Results for: **2024 Permit Renewal**

Dear Andy Slater,

ALS Environmental received 1 sample(s) on Feb 26, 2024 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Andy C. Neir

Client: ChampionX LLC
Project: 2024 Permit Renewal
Work Order: HS24021510

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24021510-01	OF 001 Resample	Water		26-Feb-2024 09:05	26-Feb-2024 13:25	<input type="checkbox"/>

Client: ChampionX LLC
Project: 2024 Permit Renewal
Work Order: HS24021510

CASE NARRATIVE

Work Order Comments

- The analysis for Amines was subcontracted to SPL in Kilgore, TX. Final report attached.
-

Client:	ChampionX LLC	ANALYTICAL REPORT
Project:	2024 Permit Renewal	WorkOrder:HS24021510
Sample ID:	OF 001 Resample	Lab ID:HS24021510-01
Collection Date:	26-Feb-2024 09:05	Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - AMINES		Method:NA		Analyst: SUB		
Subcontract Analysis	See Attached			NA	1	07-Mar-2024 14:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:

Project:

WorkOrder:

ChampionX LLC
2024 Permit Renewal
HS24021510

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R460734 (0)		Test Name : SUBCONTRACT ANALYSIS - AMINES			Matrix: Water	
HS24021510-01	OF 001 Resample	26 Feb 2024 09:05			07 Mar 2024 14:47	1

Client: ChampionX LLC
Project: 2024 Permit Renewal
WorkOrder: HS24021510

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L22-90-R2	31-Mar-2024
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

Sample Receipt Checklist

Work Order ID: HS24021510

Date/Time Received: 26-Feb-2024 13:25

Client Name: Nalco Freeport

Received by: Donald Gilmore

Completed By: /S/ Jacob Coronado	26-Feb-2024 14:08	Reviewed by: /S/ Andy C. Neir	26-Feb-2024 22:48
eSignature	Date/Time	eSignature	Date/Time

Matrices: WCarrier name: ALS Courier

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	1 Page(s)
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	COC IDs:309974
Samplers name present on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	1.5uc/1.4c ir31		
Cooler(s)/Kit(s):	red		
Date/Time sample(s) sent to storage:	02/26/2024 1409		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:			
Login Notes:	Received 7 bottles, only 2 vials needed for test to be run.		

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:



Cincinnati, OH
+1 513 733 5336

Fort Collins, CO
+1 970 490 1511

Everett, WA
+1 425 356 2600

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 309974

Houston, TX
+1 281 530 5656

Spring City, PA
+1 610 948 4903


South Charleston, WV
+1 304 356 3168

Middletown, PA
+1 717 944 5541

Salt Lake City, UT
+1 801 266 7700

York, PA
+1 717 505 5280

Customer Information			Project Information				Parameter/Method Request for Analysis										
Purchase Order	450443668	Project Name	2024 Permit Renewal		A	PCB 608, SVOC 625, VOC 624/8260_W											
Work Order		Project Number	Amines re-sample		B	200.8 (Metals), 8015 (Amines)											
Company Name	Nalco Company	Bill To Company	ChampionX LLC		C	BOD, CBOD, 300_W (NO3, SO4, Cl, F, Br), pH/Color											
Send Report To	Andy Slater	Invoice Attn	Accounts Payable - EIN 138380		D	COD, TOC, TON (Ammonia, TKN), CN_TW											
Address	PO Box 2167	Address	PO Box 2167		E	O&G, Total Phosphorus, Sulfide, Surfactants											
					F	TSS, TDS, ALK, Cr3_W, DO, Sulfite, Res Chlorine											
City/State/Zip	Freeport, TX 77542	City/State/Zip	Freeport TX 77542		G	Sub E.Coli and Enterococci to Envirodyne											
Phone	(979) 239-5800	Phone	(979) 239-5800		H	Available Cyanide (Sub to Holland, MI)											
Fax	(979) 233-6767	Fax	(979) 233-6767		I	Low level Mercury (Sub to Holland, MI)											
e-Mail Address	abslater@nalco.com	e-Mail Address	1001@invoices.nalco.com		J	Low Level Hex-Chrome (Sub to ESC)/Sub Formaldehyde A&B											
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	OF 001 Resample	9/26/24	0905	W	N	7		X									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Other				Results Due Date:					
<i>Andy Slater</i>		H/A ALS		<input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hr													
Relinquished by:		Date:	Time:	Received by:		Notes: Annual Permit Renewal											
<i>D. J.</i>		2-26-24	1055	<i>D. J.</i>													
Relinquished by:		Date:	Time:	Received by (Laboratory):													
<i>D. J.</i>		2-26-24	1325	<i>D. J.</i>													
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):													
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																	

HS24021510
ChampionX LLC
2024 Permit renewal


Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

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Project
1093216

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed 03/07/2024
15:53

TABLE OF CONTENTS
24866

This report consists of this Table of Contents and the following pages:

Report Name	Description	Pages
1093216_r02_01_ProjectSamples	SPL Kilgore Project P:1093216 C:ALS8 Project Sample Cross Reference t:304	1
1093216_r03_03_ProjectResults	SPL Kilgore Project P:1093216 C:ALS8 Project Results t:304 PO: HS24021510	2
1093216_r10_05_ProjectQC	SPL Kilgore Project P:1093216 C:ALS8 Project Quality Control Groups	1
1093216_r99_09_CoC__1_of_1	SPL Kilgore CoC ALS8 1093216_1_of_1	5
Total Pages:		9



SAMPLE CROSS REFERENCE

Project

1093216

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Printed3/7/2024Page 1 of 1

24866

Sample	Sample ID	Taken	Time	Received
2276193	HS24021510-01	02/26/2024	09:05:00	02/27/2024

Bottle 01 client supplied 40 ml glass vial(zero headspace)
Bottle 02 client supplied 40 ml glass vial(zero headspace)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 1671	01	1108075	03/06/2024	1108075	03/06/2024

Email: Kilgore.projectmanager@spl-inc.com



ALS8-G

Page 1 of 2

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project

1093216

Printed: 03/07/2024

24866

RESULTS

Sample Results

2276193	HS24021510-01	Received:	02/27/2024
Non-Potable Water	Collected by: Client	ALS Group USA Corp.	PO:
	Taken: 02/26/2024	09:05:00	HS24021510

EPA 1671		Prepared:	1108075	03/06/2024	19:04:00	Analyzed	1108075	03/06/2024	19:04:00	KAP
	Parameter	Results	Units	RL		Flags	CAS			Bottle
z	Diethylamine	<50.0	mg/L	50.0			109-89-7			01
z	Dimethylamine	<50.0	mg/L	50.0		PD	124-40-3			01
z	Methylamine	<500	mg/L	500		P	74-89-5			01
z	Trimethylamine	<500	mg/L	500		P	75-50-3			01

Sample Preparation

2276193	HS24021510-01	Received:	02/27/2024
			HS24021510
	02/26/2024		

	Prepared:	02/27/2024	15:08:26	Calculated	02/27/2024	15:08:26	CAL
z	Environmental Fee (per Project)	Verified					
	Cooler Return	Prepared:	02/28/2024	17:00:00	Analyzed	02/28/2024	17:00:00
z	Return Cooler/No bottles Require	returned					

EPA 1671		Prepared:	1108075	03/06/2024	19:04:00	Analyzed	1108075	03/06/2024	19:04:00	KAP
z	Amines by 1671	Entered								01



ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Page 2 of 2

Project

1093216

Printed: 03/07/2024

Qualifiers:

D - Duplicate RPD was higher than expected P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received (or Wet) basis unless marked Dry Weight.

Unless otherwise noted, testing was performed at SPL, Inc.- Kilgore laboratory which holds International, Federal, and state accreditations. Please see our Websites for details.

(N)ELAC - Covered in our NELAC scope of accreditation
z -- Not covered by our NELAC scope of accreditation

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of SPL Kilgore. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.



Bill Peery, MS, VP Technical Services



QUALITY CONTROL

ALS8-G

ALS Group USA Corp.
Corey Grandits
10450 Stancliff Rd
Suite 210
Houston, TX 77099-4338

Project
1093216

Printed 03/07/2024

Analytical Set **1108075**

EPA 1671

Blank

<u>Parameter</u>	<u>PrepSet</u>	<u>Reading</u>	<u>MDL</u>	<u>MQL</u>	<u>Units</u>	<u>File</u>
Diethylamine	1108075	ND	25.0	50.0	mg/L	126070800
Dimethylamine	1108075	ND	50.0	50.0	mg/L	126070800
Methylamine	1108075	ND	500	500	mg/L	126070800
Trimethylamine	1108075	ND	500	500	mg/L	126070800

CCV

<u>Parameter</u>	<u>Reading</u>	<u>Known</u>	<u>Units</u>	<u>Recover%</u>	<u>Limits%</u>	<u>File</u>
Diethylamine	1230	1000	mg/L	123	60.0 - 140	126070804
Dimethylamine	635	1000	mg/L	63.5	60.0 - 140	126070804
Methylamine	644	1000	mg/L	64.4	60.0 - 140	126070804
Trimethylamine	1200	1000	mg/L	120	60.0 - 140	126070804

MSD

<u>Parameter</u>	<u>Sample</u>	<u>MS</u>	<u>MSD</u>	<u>UNK</u>	<u>Known</u>	<u>Limits</u>	<u>MS%</u>	<u>MSD%</u>	<u>Units</u>	<u>RPD</u>	<u>Limit%</u>
Diethylamine	2276193	932	1190	ND	1000	50.0 - 150	93.2	119	mg/L	24.3	30.0
Dimethylamine	2276193	241	401	ND	1000	50.0 - 130	24.1 *	40.1 *	mg/L	49.8 *	30.0
Methylamine	2276193	305	286	ND	1000	50.0 - 130	30.5 *	28.6 *	mg/L	6.43	30.0
Trimethylamine	2276193	1440	1460	ND	1000	50.0 - 130	144 *	146 *	mg/L	1.38	30.0

* Out RPD is Relative Percent Difference: $\text{abs}(r_1 - r_2) / \text{mean}(r_1, r_2) * 100\%$

Recover% is Recovery Percent: $\text{result} / \text{known} * 100\%$

Blank - Method Blank (reagent water or other blank matrices that contains all reagents except standard(s) and is processed simultaneously with and under the same conditions as samples; carried through preparation and analytical procedures exactly like a sample; monitors); CCV - Continuing Calibration Verification (same standard used to prepare the curve; typically a mid-range concentration; verifies the continued validity of the calibration curve); MSD - Matrix Spike Duplicate (replicate of the matrix spike; same solution and amount of target analyte added to the MS is added to a third aliquot of sample; quantifies matrix bias and precision.)



1093216 CoC Print Group 001 of 001



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 24866

SUBCONTRACT TO:

SPL
2600 Dudley Rd
Kilgore, TX 75662

Phone: +1 903 984 0551

2276193

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Andy C. Neir
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Andrew.Neir@ALSGlobal.com
Alternate Contact: Jumo M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS24021510
TSR: Houston House Acct



1. HS24021510-01 OF 001 Resample

Water

26 Feb 2024 09:05

See attached Quote for sublist

11 Mar 2024

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

See Attached for
Tracking # and Temp

Relinquished By:

Date/Time:

Received By:

Date/Time:

Cooler ID(s):

Kathy Tarver SPL, Inc.

Temperature(s):

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26 Feb 2024

Page 1 of 1

Report Page 6 of 10

1093216 CoC Print Group 001 of 001

1093216 CoC Print Group 001 of 001

2600 Dudley Rd. Kilgore, Texas 75662
 24 Waterway Avenue, Suite 375 The Woodlands, TX 77380
 Office: 903-984-0551 * Fax: 903-984-5914



SPL
 The Science of Sure

Printed 01/29/2024 Page 1 of 1

COC REPORTING LIMITS

		(ug/L)			Method
Test	Name	MDL	MQL	Target/MAL	
AL-S9	104	Amines			Non-Potable Water
TCEQ Wastewater 2010 MALs (RG-194, Jan 2012)					
!FWA					
!Dea	Diethylamine	25000	50000	50000	EPA 1671 CAS:109-89-7
!Dma	Dimethylamine	50000	50000	50000	EPA 1671 CAS:124-40-3
!Mma	Methylamine	500000	500000	50000	EPA 1671 CAS:74-89-5
!Tma	Trimethylamine	500000	500000		EPA 1671 CAS:75-50-3
Achievable reporting limits may vary with dilutions in accord with the sample matrix and listed method requirements					
MQL is the Method Quantitation Limit and corresponds to a low standard				COC is Chain of Custody	
SDL is Sample Detection Limit and is the adjusted MDL (sample specific dilutions, dry weight)				MDL is Method Detection Limit (40 CFR 136 Appendix B)	
MAL is minimum analytical limit and is the selected target limit				ug/L is micrograms per liter	

1093216 CoC Print Group 001 of 001

Must Deliver Next Business Day

Time

ALS

ORIGIN ID:SGRA (281) 530-5656
 SAMPLE RECEIVING
 ALS GROUP USA, CORP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON, TX 77099
 UNITED STATES US

SHIP DATE: 26FEB24
 ACTWGT: 8.25 LB MAN
 CAD: 0221247/CAFE3755
 DIMS: 14x11x10 IN
 BILL THIRD PARTY

TO **SAMPLE RECEIVING**
SPL - KILGORE
2600 DUDLEY RD
KILGORE TX 75662

REF: HS24021510 - AN

FedEx Express

E

TUE - 27 FEB 10:30A
PRIORITY OVERNIGHT

TRAK 6862 6802 5980
 0201

75662
SHV

2/27 1032 R+

Date Time Tech
 Temp: 4.1 / 4.1 C

Therm#: 7242 Corr Fact: 0.0 C

ATTACHMENT 14

ePay Voucher

Your transaction is complete. Thank you for using TCEQ ePay.

Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt and the vouchers for your records. An email receipt has also been sent.

Transaction Information

Trace Number: 582EA000601735

Date: 03/13/2024 11:45 AM

Payment Method: CC - Authorization 0000010963

ePay Actor: KELLY A WILKINSON

Actor Email: kelly.wilkinson@championx.com

IP: 74.84.168.183

TCEQ Amount: \$1,215.00

Texas.gov Price: \$1,242.59*

* This service is provided by Texas.gov, the official website of Texas. The price of this service includes funds that support the ongoing operations and enhancements of Texas.gov, which is provided by a third party in partnership with the State.

Payment Contact Information

Name: KELLY A WILKINSON

Company: CHAMPIONX KELLY WILKINSON

Address: 101 MIST FLOWER ST, LAKE JACKSON, TX 77566

Phone: 979-239-5810

Cart Items

Click on the voucher number to see the voucher details.

Voucher	Fee Description	AR Number	Amount
696411	WW PERMIT - MINOR FACILITY SUBJECT TO 40 CFR 400-471 - RENEWAL		\$1,200.00
696412	30 TAC 305.53B WQ RENEWAL NOTIFICATION FEE		\$15.00
TCEQ Amount:			\$1,215.00

[ePay Again](#)[Exit ePay](#)

Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt for your records.