HALFF

Halff Associates, Inc.
3803 Parkwood Boulevard
Suite 800
Frisco, Texas 75034-8641

November 3, 2016

Attn: Ms. Iliana Delgado
Water Rights Permitting MC - 160
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg F
Austin, Texas 78753

RE: Application for Permit to Convey Water in Bed and Banks

Dear Ms. Delgado ,

Please find enclosed an original and six copies of IGO – USA, LP's ("IGO") Application for Permit to Convey Water in Bed and Banks ("Application") to the Texas Commission on Environmental Quality ("TCEQ"). We are aware of the time involved in the permitting process due to the tremendous demand on the TCEQ, therefore it may be beneficial for IGO to complete a Temporary Water Use Application with groundwater replacement as a condition that essentially authorizes the same operations as the Bed and Banks Application on a short-term basis. Due to IGO's urgent need to begin construction of the proposed detention pond and pumping system, we can courier the Optional Temporary Water Use Application as soon as possible, while the Bed and Banks Application is being processed if the TCEQ believes doing so would significantly expedite the permitting process. However, if the difference in time to process the application is negligible, we ask that the TCEQ proceed with processing the original Bed and Banks Application enclosed.

We have included a check for $780.48 to provide for Filing, Recording and In-Place Recreation Use fees. We ask that TCEQ calculate the required Mail Notice fees and we will remit a check for that amount.

Let us know if you need any additional information or documentation with regard to this application. Please do not hesitate to contact us should you have any questions.

Very truly yours,

Alex Alvarado, PE
Project Manager
HALFF ASSOCIATES, INC.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
APPLICATION FOR PERMIT TO APPROPRIATE STATE WATER
(SECTION 11.121, 11.042, 11.085 **OR** 11.143, TEXAS WATER CODE)
TAC CHAPTERS 30, 50, 281, 287, 288, 295, 297 AND 299
Water Supply Division, Water Rights Permitting MC-160
P.O. Box 13087
Austin, Texas 78711-3087
Telephone (512) 239-4691, FAX (512) 239-4770
(if including a check, mail directly to P.O. Box 13088, Austin, TX 78711-3088)

Notice: This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol.

1. Applicant Information.

A. Applicant Name(s): **Invest Group Overseas ("IGO") Frisco 1, LLC**
Invest Group Overseas ("IGO") USA, LP

Mailing Address: 2595 Dallas Pkwy Suite 470
Frisco, Tx 75034

Telephone Number: (972) 544-7475 Fax Number: (972) 402-5959

Email Address: hatem@igo.ae

B. Customer Reference Number (if issued): See TCEQ Core Data Form attached as Exhibit 2.

Note: If you do not have a Customer Reference Number, complete Section II of the Core Data Form (TCEQ-10400) and submit it with this application.

C. Fees and Penalties

Applicant owes fees or penalties?

☐ Yes ☑ No

If yes, provide the amount and the nature of the fee or penalty as well as any identifying number:

D. Lienholder Information

Provide this information on the holder of any liens on any land to which the water right would be appurtenant):

n/a

2. Dam (structure), Reservoir and Watercourse Data.

A. Type of Storage Reservoir (indicate by checking (√) all applicable)

☑ on-channel ☐ off-channel ☐ existing structure ☑ proposed structure* ☐ exempt structure**

*Applicant shall provide a copy of the notice that was mailed to each member of the governing body of each county and municipality in which the reservoir, or any part of the reservoir, will be located as well as copies of the certified mailing cards.

**TWC Section 11.143 for uses of water for other than domestic, livestock, or fish and wildlife from an existing, exempt reservoir with a capacity of 200 acre-feet or less. Please complete Paragraph 6 below if proceeding under TWC 11.143.

Date of Construction: approximately 6 months after which this permit is issued

B. Location of Reservoir No 1

1) Watercourse: unnamed tributary of Stewart Creek

2) Location from County Seat: S 51.2° W 13.9 miles in a SW direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.8° E 2.3 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

3) Zip Code: 75034

4) The dam will be/is located in the Collin County School Land Original Survey No. 6, Abstract No. 149 in Collin County, Texas.

5) Station 6+00 on the centerline of the dam is N 48.8° W (bearing), 988.5 feet (distance) from the SE corner of Collin County School Land Original Survey No. 6, Abstract No 149, in Collin County, Texas, also being at Latitude 33.118250 °N, Longitude 96.825197°W.

Provide the Latitude and Longitude coordinates in decimal degrees, to at least six decimal places, and indicate the method used to calculate the diversion point location.
USGS 7.5 Topographic Map
Refer to Attachment 3 in Exhibit 4 for a USGS Topographic Map of proposed Reservoir locations.

C. Reservoir:

1) Acre-feet of water impounded by structure at normal maximum operating level: 2.370 acre-feet

2) Surface area in acres of reservoir at normal maximum operating level: 0.4606 acres

D. Drainage Area

The drainage area above the dam is 293 acres or 0.458 square miles.

E. Other

1) If this is a U.S. Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service (SCS)) floodwater-retarding structure, provide the Site No. _____ and watershed project name Not a NRCS structure.

2) Do you request authorization to close the "ports" or "windows" in the service spillway?

☐ Yes ☑ No

3. Appropriation/Diversion Request (total amount of water needed, including maximum projected uses and accounting for evaporative losses for off-channel storage, if applicable).

A. Appropriated water will be used as follows:

	Purpose*	Place of Use	Acre-feet per year
1)	conveyance	Proposed Detention Pond System	296825.9
2)			
3)			

*If agricultural use, list crops(s) to be irrigated:

_____

B. Lands to be irrigated (if applicable):

1) Applicant proposes to irrigate a total of _____ acres in any one year. This acreage is all of or

part of a larger tract(s) which is described in a supplement attached to this application and contains a total of _____ acres in _____ County, Texas. A copy of the deed(s) describing the overall tract(s) with the recording information from the county records is attached in Exhibit 11.

2) Location of land to be irrigated: In the _____Original Survey No. ___, Abstract No. ___.

C. Diversion Point No 1.

1) Watercourse: an unnamed tributary of Stewart Creek.

2) Location of point of diversion at Latitude 33.116594 °N, Longitude 96.824125 °W,
Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places, and indicate the method used to calculate the diversion point location..

USGS 7.5 Topographic Map
Refer to Attachment 2 in Exhibit 4 for a USGS Topographic Map with Diversion Point locations.

also bearing N 82.3° W, 409 feet (distance) from the SE corner of the Collin County School Land Original Survey No. 6, Abstract No.149, in Collin County, Texas.

3) Location from County Seat: S 50.7° E 13.9 miles in a SW direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 15.6° E 2.4 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

4) Zip Code: 75034

5) The diversion will be (check (√) all appropriate boxes and if applicable, indicate whether existing or proposed):

	Directly from stream	Existing	Proposed
	From an on-channel reservoir		✓
	From stream to an off-channel reservoir		
	From a stream to an on-channel reservoir		
	From an off-channel reservoir		
	Other method (explain fully, use additional sheets if necessary)		

6) Rate of Diversion (Check (√) applicable provision):

___1. Diversion Facility:

A. _____ Maximum gpm (gallons per minute)

B. _____ Number of pumps

C. _____ Type of pump

D. _____ gpm, Pump capacity of each pump

E. Portable pump _____ Yes or _____ No.

_✓_ 2. If by gravity:

A. ____ Headgate _____ Diversion Dam _____ Maximum gpm

B. ✓ Other method (explain fully - use additional sheets if necessary)

A proposed storm drain system consisting of 3 – 7'x5' RCBs to a proposed headwall into Reservoir No 1; refer to Exhibit 3, Additional Statement, for additional information.

7) The drainage area above the diversion point is 293 acres or 0.458 square miles.

D. Return Water or Return Flow **(location and quantity information, provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places and indicate the method used to calculate the diversion point location):**

Water which is diverted but not consumed as a result of the above stated use, will be returned to

An unnamed tributary of Stewart Creek, Trinity River Basin, at Discharge Point No 1 which is at Latitude 33.119667°N, Longitude 96.826125°W, also, bearing N 41.7° W, 1557.7 feet (distance) from the SE corner of the Collin County School Land Original Survey No. 6, Abstract No. 149, in Collin County, Texas.

Zip Code: 75034

Estimated **annual** amount of return flow to said stream will be 296825.9 acre-feet.

E. Surplus Water **(provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places and indicate the method used to calculate the diversion point location):**

Water which is diverted but not used beneficially will be returned to _____,

tributary of _____, _____ Basin at a point

which is at Latitude _____°N, Longitude _____°W, also

bearing _____° _____ (direction), _____feet

(distance) from the _____ corner of the _____ Original Survey

No. _____, Abstract No. _____, in _____ County, Texas.

Zip Code: _____

4. Discharge Point Information **(if applicable, provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places and indicate the method used to calculate the diversion point location).**

Discharge Point No. or Name: Discharge Point No 1

A. Select the appropriate box for the source of water being discharged:

☐ Treated effluent

☐✓ Groundwater

☐✓ Other State Waters

B. Location of discharge point will be at Latitude 33.119667° N, Longitude 96.826125°W,

also bearing N 41.7 ° W, 1557.7 feet from the SE corner of the Collin County School Land

Original Survey No. 6, Abstract No. 149, in Collin County, Texas.

What method was used to determine the Latitude and Longitude for the discharge point? (*i.e.*, GPS Unit, USGS 7.5 Topographic Map, etc.)

USGS 7.5 Topographic Map
Refer to Attachment 5 in Exhibit 4 for a USGS Topographic Map of Discharge Point locations.

C. Location from County Seat: S 51.7° W 13.8 miles in a SW direction from McKinnney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.1° E 2.1 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

D. Zip Code: 75034

E. Water will be discharged into an unnamed tributary of Stewart Creek stream/reservoir, (tributaries) of the Trinity River Basin.

F. Water will be discharged at a maximum rate of 1120 cfs (502390.9 gpm), during a 100-year storm event .

G. The average amount of water that will be discharged is 1.290 acre-feet per year.

H. The purpose of use for the water being discharged will be to be passed downstream at existing flows.

I. Additional information required:

For groundwater

1) Provide water quality analysis and 24 hour pump test for the well if one has been conducted. Refer to Exhibit 9 for Water Quality Analysis. A 24 hour pump test will be performed once well construction is complete. Refer to Exhibit 14 for historical pump data for similar sized wells within the Woodbine Aquifer.

2) Locate and label the groundwater well(s) on a USGS 7.5 Minute Topographic Map. Refer to Attachment 4 in Exhibit 4 for location of groundwater wells.

3) Provide a copy of the groundwater well permit if it is located in a Groundwater Conservation District. Refer to Exhibit 13 for NTCGD Groundwater Well Documentation.

4) What aquifer the water is being pumped from? Woodbine Aquifer

For treated effluent

1) What is the TPDES Permit Number? Provide a copy of the permit. n/a

2) Provide the monthly discharge data for the past 5 years. n/a

3) What % of treated water was groundwater, surface water? n/a

4) If any original water is surface water, provide the base water right number. n/a

5. General Information.

A. The proposed ✓ or existing _____ works will be (are) located on the land of "Applicant", whose mailing address is 2595 Dallas Pkwy Suite 470

Frisco, Tx 75034

B. If an application for the appropriation is granted, either in whole or in part, construction works will begin within 1 day after such permit is issued. The proposed work will be completed within 6 months from the date the permit is issued.

C. A Water Conservation Plan is attached? _____ Yes ✓ No

D. ✓ Interbasin transfer is not requested.

_____ Applicant requests authorization to transfer _____ acre-feet of water per year from the _____ Basin to the _____ Basin of which _____ acre-feet of water will be used for _____ purposes and _____ acre-feet of water will be used for _____ purposes.

E. ✓ Bed and Banks request to transfer 296825.9 acre-feet of water per year within the bed and banks of an unnamed tributary of Stewart Creek, Trinity River Basin.

F. Is this project located within 200 river miles of the coast? _____ Yes ✓ No _____ Unknown

5. **Maps, plats, plans, and drawings accompany this application as required by applicable TAC Sections.**

   ___✓___ Yes _____ No. Attach additional sheets.

6. _____The dam(s) and reservoir(s) shown on the attached application was (were) constructed for domestic and livestock purposes and I/we elect to seek a permit under Section 11.143 of the Texas Water Code.

7. Provide information describing how this application addresses a water supply need in a manner that is consistent with the state water plan or the applicable approved regional water plan for any area in which the proposed appropriation is located or, in the alternative, describe conditions that warrant a waiver of this requirement.

Applicant Name (Sign)	Applicant Name (Sign)
Applicant Name (Printed)	Applicant Name (Printed)

SWORN TO AND SUBSCRIBED before me this 30th day of September, 2016.

Notary Public for the State of Texas

RHIANNON BUONO
Notary Public
State of Texas
My Comm. Expires 04-23-2017

Supplemental Dam/Reservoir Information Sheet

Dam (structure), Reservoir and Watercourse Data

A. Type of Storage Reservoir (indicate by checking (√) all applicable)

☑ on-channel ☐ off-channel ☐ existing structure ☑ proposed structure*

☐ exempt structure**

*Applicant shall provide a copy of the notice that was mailed to each member of the governing body of each county and municipality in which the reservoir, or any part of the reservoir, will be located as well as copies of the certified mailing cards. No state water will be appropriated and/or used. All state water will be conveyed and pass unobstructed downstream at existing flow conditions.

**TWC Section 11.143 for uses of water for other than domestic, livestock, or fish and wildlife from an existing, exempt reservoir with a capacity of 200 acre-feet or less. Please complete Paragraph 6 below if proceeding under TWC 11.143.

Date of Construction 6 months after which this permit is issued

B. Location of Reservoir No 2.

1) Watercourse: unnamed tributary of Stewart Creek

2) Location from County Seat: S 51.4° W 13.9 miles in a SW direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.8° E 2.2 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

3) Zip Code: 75034

4) The dam will be/is located in the Collin County School Land Original Survey No. 6, Abstract No. 149 in Collin County, Texas.

5) Station 3+00 on the centerline of the dam is N 41.5° W (bearing), 1250.7 feet (distance) from the SE corner of Collin County School Land Original Survey No. 6, Abstract No.149, in Collin County, Texas, also being at Latitude 33.119036 °N, Longitude 96.825461°W.

Provide Latitude and Longitude coordinates in decimal degrees to at least six decimal places and indicate the method used to calculate the diversion point location

USGS 7.5 Topographic Map

Refer to Attachment 3 in Exhibit 4 for a USGS Topographic Map of Reservoir locations.

C. Reservoir:

1) Acre-feet of water impounded by structure at normal maximum operating level: 2.846 acre-feet

2) Surface area in acres of reservoir at normal maximum operating level: 0.874 acres

D. The drainage area above the dam is 293 acres or 0.458 square miles.

E. Other:

1) If this is a U.S. Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service (SCS)) floodwater-retarding structure, provide the Site No. _____ and watershed project name Not a NRCS structure

2) Do you request authorization to close the "ports" or "windows" in the service spillway?

☐ Yes ☑ No

Supplemental Dam/Reservoir Information Sheet

Dam (structure), Reservoir and Watercourse Data

B. Type of Storage Reservoir (indicate by checking (√) all applicable)

☑ on-channel ☐ off-channel ☐ existing structure ☑ proposed structure*

☐ exempt structure**

*Applicant shall provide a copy of the notice that was mailed to each member of the governing body of each county and municipality in which the reservoir, or any part of the reservoir, will be located as well as copies of the certified mailing cards. No state water will be appropriated and/or used. All state water will be conveyed and pass unobstructed downstream at existing flow conditions.

**TWC Section 11.143 for uses of water for other than domestic, livestock, or fish and wildlife from an existing, exempt reservoir with a capacity of 200 acre-feet or less. Please complete Paragraph 6 below if proceeding under TWC 11.143.

Date of Construction 6 months after which this permit is issued

B. Location of Reservoir No 3.

1) Watercourse: unnamed tributary of Stewart Creek

2) Location from County Seat: S 51.6° W 13.8 miles in a SW direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.4° E 2.2 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

3) Zip Code: 75034

4) The dam will be/is located in the Collin County School Land Original Survey No. 6, Abstract No. 149 in Collin County, Texas.

5) Station 0+50 on the centerline of the dam is N 40.0° W (bearing), 1483.3 feet (distance) from the SE corner of Collin County School Land Original Survey No. 6, Abstract No.149, in Collin County, Texas, also being at Latitude 33.119589 °N, Longitude 96.825861 °W.

Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places, and indicate the method used to calculate the diversion point location.

USGS 7.5 Topographic Map

Refer to Attachment 3 in Exhibit 4 for a USGS Topographic Map of Reservoir locations.

C. Reservoir:

1) Acre-feet of water impounded by structure at normal maximum operating level: 1.516 acre-feet

2) Surface area in acres of reservoir at normal maximum operating level: 0.216 acres

D. The drainage area above the dam is 293 acres or 0.458 square miles.

E. Other:

1) If this is a U.S. Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service (SCS)) floodwater-retarding structure, provide the Site No. _____ and watershed project name Not a NRCS structure

2) Do you request authorization to close the "ports" or "windows" in the service spillway?

☐ Yes ☑ No

Supplemental Diversion Point Information Sheet

Diversion Point No 2. (Provide a completed *Supplemental Diversion Point Information Sheet* for additional diversions)

1) Watercourse: unnamed tributary of Stewart Creek

2) Location of point of diversion at Latitude 33.118711 °N, Longitude 96.825381 °W,

also, bearing N 44.4 ° W, 1146.4 feet (distance) from the SE corner of the Collin County School Land Original Survey No. 6 , Abstract No. 149, in Collin County, Texas.

Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places, and indicate the method used to calculate the diversion point location.

USGS 7.5 Topographic Map

Refer to Attachment 2 in Exhibit 4 for a USGS Topographic Map of Diversion Point locations.

3) Location from County Seat: S 51.3° W 13.9 miles in a SE direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.8° E 2.2 miles in a SE

direction from Frisco, Texas, a nearby town shown on county highway map.

4) Zip Code: 75034

5) The diversion will be (check (√) all appropriate boxes and if applicable, indicate whether existing or proposed):

	Directly from stream	Existing	Proposed
	From an on-channel reservoir		✓
	From stream to an off-channel reservoir		
	From a stream to an on-channel reservoir		
	From an off-channel reservoir		
	Other method (explain fully, use additional sheets if necessary)		

6) Rate of Diversion (Check (√) applicable provision):

___1. Diversion Facility:

A._____ Maximum gpm (gallons per minute)

1) _____ Number of pumps
2) _____ Type of pump
3) _____ gpm, Pump capacity of each pump
4) Portable pump _____ Yes or _____ No

_✓__2. If by gravity:

A._____ Headgate _____ Diversion Dam _____ Maximum gpm

B._✓_ Other method (explain fully - use additional sheets if necessary)

The Proposed Diversion Structure will be a spillway as part of the detention pond system. Refer to Exhibit 3, Additional Statement, for additional information.

7) The drainage area above the diversion point is 293 acres or 0.458 square miles.

Supplemental Diversion Point Information Sheet

Diversion Point No 3.

1) Watercourse: unnamed tributary of Stewart Creek

2) Location of point of diversion at Latitude 33.119472 °N, Longitude 96.825772 °W, also, bearing N 40.2° W, 1433.9 feet (distance) from the SE corner of the Collin County School Land Original Survey No. 6, Abstract No. 149, in Collin County, Texas. **Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places, and indicate the method used to calculate the diversion point location.**

USGS 7.5 Topographic Map

Refer to Attachment 2 in Exhibit 4 for a USGS Topographic Map of the Diversion Point locations.

3) Location from County Seat: S 51.7° W 13.9 miles in a SE direction from McKinney, Collin County, Texas.

Location from nearby town (if other than County Seat): S 14.5° E 2.2 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

4) Zip Code: 75034

5) The diversion will be (check (√) all appropriate boxes and if applicable, indicate whether existing or proposed):

	Directly from stream	Existing	Proposed
	From an on-channel reservoir		✓
	From stream to an off-channel reservoir		
	From a stream to an on-channel reservoir		
	From an off-channel reservoir		
	Other method (explain fully, use additional sheets if necessary)		

6) Rate of Diversion (Check (√) applicable provision):

___1. Diversion Facility:

A._____ Maximum gpm (gallons per minute)

1) _____ Number of pumps
2) _____ Type of pump
3) _____ gpm, Pump capacity of each pump
4) Portable pump _____ Yes or _____ No

_✓_2. If by gravity:

A._____ Headgate _____ Diversion Dam _____ Maximum gpm

B._✓_ Other method (explain fully - use additional sheets if necessary)

The Proposed Diversion Structure will be a spillway as part of the detention pond system. Refer to Exhibit 3, Additional Statement, for additional information.

7) The drainage area above the diversion point is 293 acres or 0.458 square miles.

Supplemental Discharge Point Information Sheet

Discharge Point No. or Name: Discharge Point No 2/Pump No 1

1) Select the appropriate box for the source of water being discharged:

☐ Treated effluent

✓ Groundwater

2) Location of discharge point will be/is at Latitude 33.118064° N, Longitude 96.824394°W, also bearing N 40.1°W, 769.6 feet from the SE corner of the Collin County School Land Original Survey No. 6, Abstract No. 149, in Collin County, Texas.

Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places and indicate the method was used to determine the Latitude and Longitude for the discharge point? (*i.e.*, GPS Unit, USGS 7.5 Topographic Map, etc.)

USGS 7.5 Topographic Map

Refer to Attachment 5 in Exhibit 4 for a USGS Topographic Map of proposed Diversion Point locations.

3) Location from County Seat: S 51.1° W, 13.8 miles in a SW direction from McKinney,

Collin County, Texas.

Location from nearby town (if other than County Seat): S 15.9° E, 2.3 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

4) Zip Code: 75034

5) Water will be discharged into Reservoir No 1 stream/reservoir, (tributaries) an unnamed tributary of Stewart Creek, Trinity River Basin.

6) Water will be discharged at a maximum rate of 0.045 cfs (20 gpm).

7) The average amount of water that will be discharged is 9.245 acre-feet per year.

8) The purpose of use for the water being discharged will be to compensate for evaporation losses of water in the detention pond system. An additional amount of 10% of the water lost to evaporation will be discharged to ensure all water in the reservoirs will flow downstream via the spillways and out Discharge Point No 1.

9) Additional information required:

For groundwater

1. Provide water quality analysis and 24 hour pump test for the well if one has been conducted. Refer to Exhibit 9 for Water Quality Analysis. A 24 hour pump test will be performed once well construction is complete. Refer to Exhibit 14 for historical pump data for similar sized wells within the Woodbine Aquifer.
2. Locate and label the groundwater well(s) on a USGS 7.5 Minute Topographic Map. Refer to Attachment 4 in Exhibit 4 for location of groundwater wells.
3. Provide a copy of the groundwater well permit if it is located in a Groundwater Conservation District. Refer to Exhibit 13 for NTCGD Groundwater Well Documentation.
4. What aquifer the water is being pumped from? Woodbine Aquifer

For treated effluent

1. What is the TPDES Permit Number? Provide a copy of the permit. n/a
2. Provide the monthly discharge data for the past 5 years. n/a
3. What % of treated water was groundwater, surface water? n/a
4. If any original water is surface water, provide the base water right number. n/a

Supplemental Discharge Point Information Sheet

Discharge Point No. or Name: Discharge Point No 3/Pump No 2

1) Select the appropriate box for the source of water being discharged:

   ☐ Treated effluent

   ✓ Groundwater

2) Location of discharge point will be/is at Latitude 33.117356° N, Longitude 96.826011°W, also bearing N 71.9°W, 1038.3 feet from the SE corner of the Collin County School Land Original Survey No. 6, Abstract No. 149, in Collin County, Texas.

   Provide Latitude and Longitude coordinates in decimal degrees, to at least six decimal places and indicate the method was used to determine the Latitude and Longitude for the discharge point? (*i.e.*, GPS Unit, USGS 7.5 Topographic Map, etc.)

   USGS 7.5 Topographic Map

   Refer to Attachment 5 in Exhibit 4 for a USGS Topographic Map of proposed Discharge Point locations.

3) Location from County Seat: S 51.1° W, 51.1 miles in a SW direction from McKinney, Collin County, Texas.

   Location from nearby town (if other than County Seat): S 13.3° E, 2.3 miles in a SE direction from Frisco, Texas, a nearby town shown on county highway map.

4) Zip Code: 75034

   5) Water will be discharged into Reservoir No 1 stream/reservoir, (tributaries) an unnamed tributary of Stewart Creek, Trinity River Basin in the event of Pump No 1 failure.

6) Water will be discharged at a maximum rate of 0.045 cfs (20 gpm).

7) The average amount of water that will be discharged is 9.245 acre-feet per year.

8) The purpose of use for the water being discharged will be to compensate for evaporation losses of water in the detention pond system in the event of Pump No 1 failure. In the event Pump No 1 malfunctions, Pump No 2 will also discharge an additional amount of 10% of the water lost to evaporation to ensure all water in the reservoirs will flow downstream via the spillways and out Discharge Point No 1.

9) Additional information required:

For groundwater

1. Provide water quality analysis and 24 hour pump test for the well if one has been conducted. Refer to Exhibit 9 for Water Quality Analysis. A 24 hour pump test will be performed once well construction is complete. Refer to Exhibit 14 for historical pump data for similar sized wells within the Woodbine Aquifer.
2. Locate and label the groundwater well(s) on a USGS 7.5 Minute Topographic Map. Refer to Attachment 4 in Exhibit 4 for location of groundwater wells.
3. Provide a copy of the groundwater well permit if it is located in a Groundwater Conservation District. Refer to Exhibit 13 for NTCGD Groundwater Well Documentation.
4. What aquifer the water is being pumped from? Woodbine Aquifer

For treated effluent

1. What is the TPDES Permit Number? Provide a copy of the permit. n/a
2. Provide the monthly discharge data for the past 5 years. n/a
3. What % of treated water was groundwater, surface water? n/a
4. If any original water is surface water, provide the base water right number. n/a

Supplemental Environmental Information Sheet

Water right projects have the potential to alter environmental conditions in the state's rivers and streams through flow modification, sediment load alteration, loss of wetlands, and removal of riparian vegetation. The Resource Protection Team assess the effects issuance or amendment of a water right may have on existing instream uses. Instream uses include, but are not limited to, water quality, fish and wildlife habitat, recreation, and freshwater inflows to bays and estuaries.

The following items are suggested guidelines for data to be submitted depending on the nature of the particular application. Please note that *not* all the information identified below is required for the water right application to be considered administratively complete. However, depending on the magnitude and scope of the proposed project, failure to provide requested information for technical review may result in delayed processing times or a recommendation of denial of the application.

ITEMS TO BE PROVIDED FOR ALL APPLICATIONS:

1. USGS 7.5 minute topographic map with all diversion points, discharge points, reservoirs, and/or land to be irrigated clearly indicated. Refer to Attachment 2, Attachment 5, Attachment 3 and Attachment 6 in Exhibit 4 for USGS Topographic Maps of diversion points, discharge points, reservoirs and land to be irrigated respectively.

2. Photographs of the stream at the project area (i.e., diversion point/dam location) including upstream and downstream views. Photographs should be in color and reflect the existing conditions of the stream and the riparian vegetation. Each photograph should include a description of what is depicted as well as be referenced to the USGS topographic map indicating the location and direction of the shot. Refer to Exhibit 5 for photographs of the project area. Refer to Attachment 10 in Exhibit 4 for a USGS Topographic Map of these photograph locations.

3. Brief description of the affected stream or water body at the project location including:

    a) Average and maximum channel width and depth; Refer to Attachment C in Exhibit 10, 404 Permitting Documents.
    b) Flow characteristics of the stream (i.e., is the stream perennial, intermittent with pools, or intermittent?); Refer to Attachment C in Exhibit 10, 404 Permitting Documents.
    c) Description of land uses upstream within the watershed, if known. Refer to Exhibit 8, Environmental Analysis.

4. Any known recreation or other public uses of the affected stream or water body. Refer to Exhibit 8, Environmental Analysis

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ADDITIONAL ITEMS TO BE PROVIDED IF AN EXISTING DAM AND RESERVOIR ARE SOUGHT TO BE PERMITTED:

1. Date dam constructed. n/a; detention pond system is proposed.

2. Will the reservoir be maintained at normal pool elevation with an alternate source of water? If so, identify the source of water. If groundwater will be used, see below. n/a; detention pond system is proposed.

3. Does the dam have an operational low flow outlet or other means to pass state water? n/a; detention pond system is proposed.

MINIMAL ADDITIONAL ITEMS TO BE PROVIDED IF A DAM AND RESERVOIR ARE PROPOSED TO BE CONSTRUCTED:

1. In addition to indicating the location of the project location on the USGS topographic map, please identify the area of lake inundation at normal pool level. Refer to Attachment 1 in Exhibit 4 for a USGS Topographic Map of the project location. Refer to Attachment 11 in Exhibit 4 for a USGS Topographic Map of the area of lake inundation.

2. Provide a brief description of the area to be affected by the proposed dam and reservoir. Refer to Exhibit 3, Additional Statement.

3. The local U.S. Army Corps of Engineers (USACE) district should be notified of the proposed project. If the USACE determines that a 404 permit is required, provide the project number and name of the USACE Project Manager. USACE Permit #201500058, the USACE Project Manager is Fred Land. Refer to Exhibit 10 for 404 Permitting Documents.

4. Will the reservoir be maintained at normal pool elevation with an alternate source of water? If so, identify the source of water. If groundwater will be used, see below. The reservoir will be maintained at normal pool elevation with IGO's privately owned groundwater. Refer to Exhibit 3, Additional Statement, for additional information.

5. Will the dam have a low flow outlet or other means to pass state water? Yes, each reservoir will pass all state waters at existing flow conditions through a series of diversion dams. A proposed outlet structure (Discharge Point No 1) will pass all state waters downstream into the existing unnamed tributary of Stewart Creek. Refer to Exhibit 3 for additional information on the proposed detention pond system.

POSSIBLE ADDITIONAL ITEMS TO BE PROVIDED IF A DAM AND RESERVOIR ARE PROPOSED TO BE CONSTRUCTED:

1. A quantitative or qualitative evaluation of existing aquatic, riparian, wetland, and terrestrial habitats that will be subject to impact by the proposed reservoir project, preferably performed by a qualified third party. Acceptable evaluation procedures to be used may include, but are not limited to, USFWS's Habitat Evaluation Procedures or TPWD's Wildlife Habitat Appraisal Procedure. Any habitat evaluation should include an assessment of the effects of the project on habitats in the river segment downstream. Refer to Exhibit 8, Environmental Analysis. Also refer to Exhibit 10 for a copy of the USACE 404 Permitting Documents.

2. Description of the alternatives that were examined to meet the water needs that the proposed project is intended to fulfill. Were other site locations examined that may result in less environmental impact? How was the size of the proposed reservoir determined? Would a smaller reservoir be adequate to meet the projected water needs? Habitat mitigation shall be considered only after the complete sequencing (avoidance, minimization or modification, and compensation/replacement) process has been performed. Refer to Exhibit 10 for 404 Permitting Documents.

3. Should habitat losses be found to be unavoidable, a mitigation plan should be developed that will compensate for lost or altered ecosystem functions and values imposed by the proposed project. This plan should address both the direct and indirect impacts to aquatic, riparian, and terrestrial habitats, as well as short- and long-term effects that may result from the proposed project. Habitat mitigation plans shall be ensured through binding legal contracts or conservation easements and shall include goals and schedules for completion of those goals. Mitigation areas shall be managed in perpetuity by a party approved by the Commission to maintain the habitat functions and values that will be affected by the proposed project. Refer to Attachment J in Exhibit 10 for a copy of IGO's proposed mitigation plan.

ADDITIONAL ITEMS TO BE PROVIDED IF GROUNDWATER WILL BE USED:

Information regarding the groundwater wells to be used in this project and groundwater quality data from each well to be used. Well information should include the following:

a) Depth of well; Approximately 900 feet, refer to Exhibit 3 and Exhibit 12.
b) Name of aquifer from which water is withdrawn; Woodbine Aquifer
c) Pumping capacity of well. 20 gpm

Water chemistry information should include but not be limited to the following parameters:
a) Chlorides;
b) Sulfates;
c) Total Dissolved Solids (TDS);
d) pH;
e) Temperature.

If data for on-site wells are unavailable, historical data collected from similar sized wells drawing water from the same aquifer may be provided. However, please note that on-site data may still be required when it becomes available. Refer to Exhibit 14 for historical pump data of similar wells drawing from the Woodbine Aquifer. Refer to Attachment 7 in Exhibit 4 for a USGS Topographic Map indicating these well locations.

Alternatives Analysis Worksheet for Wetland Impacts

Refer to Attachment F in Exhibit 10 for an analysis of project alternatives.

1. Alternatives
    1. How could you satisfy your needs in ways which do not affect wetlands?
    2. How could the project be re-designed to fit the site without affecting wetlands?
    3. How could the project be made smaller and still meet your needs?
    4. What other sites were considered?
        1. What geographic area was searched for alternative sites?
        2. How did you determine whether other non-wetland sites are available for development in the area?
    5. What are the consequences of not building the project?

2. Comparison of alternatives
    1. How do the costs for the alternatives considered above?
    2. Are there logistic (location, access, transportation, etc.) factors that limit the alternatives considered?
    3. Are there technological limitations for the alternatives considered?
    4. Are there other reasons certain alternatives are not feasible?

3. If you have not chosen an alternative which would avoid wetland impacts, explain:
    1. Why your alternative was not selected?
    2. What you plan to do to minimize adverse effects on the wetlands impacted?

4. Please provide a comparison of each criterion (from Part II) for each site evaluation in the alternatives analysis.

PERMIT APPLICATION COMPLETION CHECKLIST FOR
HYDROLOGY, WATER CONSERVATION, AND DAM SAFETY

Name(s) of Applicant:

Stream, Basin, and County:

USGS 7.5 minute topographic map with all diversion points, discharge points, reservoirs, and/or land to be irrigated clearly indicated:

Latitude and Longitude of all diversion points and/or reservoirs, including how the coordinates were determined:

Diversion amount:
Diversion rate:

Monthly Diversion Distribution (the amount of the total water that you plan to divert each month):

J F M A M J J A S O N D

Reservoir capacity and surface area:

Drainage area:

Request to use the bed and banks of a watercourse and/or reservoir:

Other (copy of contract for water, alternate source of water, accounting plan, etc.)

WATER CONSERVATION PLAN

1. Plan and appropriate data form

2. Please specify the quantitative goals as outlined on the data form

DAM SAFETY

If a reservoir is requested in the application, the following information should be submitted:

1. Surface area and capacity of the reservoir

2. Plans (with engineer's seal) for the reservoir if the dam is over 6 feet high

3. Engineer's signed and sealed hazard classification

4. Statement from engineer that the structure complies with the Chapter 299 Rules and supporting documentation

ADDITIONAL STATEMENT OF IGO – USA, LP's APPLICATION TO CONVEY WATER IN BED AND BANKS IN COLLIN COUNTY

I. APPLICANT

IGO – USA, LP ("IGO") owns property in Collin County, referred to as "The Gate." See Exhibit 4 for USGS Topographic Maps of The Gate; refer to Figure A in Exhibit 5 for an aerial of the proposed site. IGO owns the groundwater on The Gate property. See Exhibit 7 for relevant deeds for The Gate. IGO is working on a mixed use development.

II. BACKGROUND

To effectively develop its property for future use, IGO is applying for this bed and banks permit from the Texas Commission on Environmental Quality ("TCEQ") to be able to convey water through its proposed site. Specifically, IGO intends to utilize this bed and banks permit to convey state water via a proposed detention pond system with multiple spillway structures. All diversion points are necessary in order to fully convey all state water downstream at existing flows. Therefore IGO requests TCEQ to consider the detention pond system as a whole and include all diversion points in their consideration for IGO's Bed and Banks application. Additionally, IGO's application requests to discharge IGO's privately owned groundwater into the proposed detention pond system and subsequently into the unnamed tributary of Stewart Creek in order to ensure existing flow conditions are met. This groundwater will be used as make-up water due to evaporation losses occurring within the detention pond system. The geographic area on which the state waters will be conveyed is relatively small and lies within the boundaries of IGO's property. This application does not impair existing water rights or vested riparian rights.

III. DETAILS OF THE APPLICATION

A. Transport of State Waters in the Bed and Banks of an unnamed tributary of Stewart Creek at Diversion Point No 1

IGO's application requests authorization to transport state waters from an unnamed tributary of Stewart Creek through IGO's proposed detention pond system that shall be located within the same vicinity of the existing tributary, see Figure A in Exhibit 5 for an aerial of the proposed site. Refer to Attachment 1 in Exhibit 4 for a USGS Topographic Map of The Gate. The proposed project area is currently undeveloped land approximately 0.75 miles east of the Denton/Collin County boundary. Two branches of an unnamed tributary to Stewart Creek are located within the project area; the southern branch in a southeast to northwest direction and the northern branch in an east to west direction; refer to Attachment C in Exhibit 10 for a detailed description of existing stream conditions and flow characteristics. State water will be diverted at the southernmost part of IGO's property at a proposed junction structure (Diversion Point No 1). Diversion Point 1 is located at Latitude 33.116594° N and Longitude 96.824125° W, refer to Attachment 2 in Exhibit 4 for a map of this location. During a site visit IGO measured the existing flow rate at Diversion Point No 1 and determined the water has been ponding near the existing structure and there was no flow to be recorded. Refer to photographs Location 01 and Location 02 in Exhibit 5 for existing site conditions at this location. See Analysis of Existing Flow

Conditions in section IV of this report for a brief summary of the methodology used to calculate existing flows entering and exiting the proposed site. From Diversion Point No 1, state waters will be transported via a proposed storm system to the proposed detention pond with a maximum flow capacity of 1,380.54 cubic feet per second or 999,463.53 acre-feet per year. In the event of a 100-year flood, the storm system will have a flow of 924.18 cubic feet per second or 82,597.24 acre-feet per year. The proposed storm system will only divert state waters and convey them to the downstream end of the proposed detention pond, into Reservoir No 1; refer to Attachment 3 in Exhibit 4 for a USGS Topographic Map of reservoir locations. Reservoir No 1 will be maintained at normal pool elevation and will have a surface area of 0.461 acres and hold approximately 2.370 acre-feet of groundwater at all times. This will be achieved by introducing groundwater into Reservoir 1 via a proposed pumping system. Pump No 1 will discharge IGO's privately owned groundwater into Reservoir No 1 to initially fill the reservoir and as make-up water lost due to evaporation. Refer to Section IV below and Exhibit 12 for additional information regarding IGO's proposed pumping system. No state waters will be used nor stored in these reservoirs, only conveyed through the proposed system. Refer to subsection B below, The Transport of State Waters in the Bed and Banks of an unnamed tributary of Stewart Creek at Diversion Point No 2, for additional information regarding the use of spillways within the proposed detention pond system to prevent storage of state waters throughout each reservoir.

B. Transport of State Waters in the Bed and Banks of an unnamed tributary of Stewart Creek at Diversion Point No 2

Diversion Point No 2 is the spillway located at the downstream end of Reservoir No 1 (Latitude 33.118711° N and Longitude 96.825381° W), refer to Attachment 2 in Exhibit 4 for a USGS Topographic Map of this location. The spillways located throughout the detention pond (Diversion Point No 2 and Diversion Point No 3) will allow for a constant flow of water into the next downstream reservoir until the state waters reach their discharge point downstream of Reservoir No 3. Refer to Exhibit 19 for a cross section of the proposed spillways. It is anticipated by using these spillways, in combination with the groundwater pumping system, state waters will pass downstream. Once state waters reach Diversion Point No 2, they will pass unobstructed over the spillway into the downstream Reservoir No 2 to provide flows to existing conditions at Discharge Point No 1. By supplying the reservoir with IGO's groundwater via Pump No 1, excess water will spillover Diversion Point No 2 from Reservoir No 1 and will ensure Reservoir No 2 is maintained at normal pool elevation. Refer to Attachment 4 in Exhibit 4 for a map of the proposed pump locations. At normal maximum operating level, Pump No 1 combined with the spillway system, will maintain Reservoir No 2 with a surface area of 0.874 acres and a volume of 2.846 acre-feet. A map of the locations of the proposed reservoirs can be found in Attachment 3 in Exhibit 4. Refer to Section IV of this report, Information Related to the Application, for additional information regarding the pumping system.

C. Transport of State Waters in the Bed and Banks of an unnamed tributary of Stewart Creek at Diversion Point No 3

Diversion Point No 3 is the spillway located at the downstream end of Reservoir No 2 (Latitude 33.119472° N and Longitude 96.825772° W), refer to Attachment 2 in Exhibit 4 for a USGS Topographic Map of this location. Diversion Point No 3 functions in the same manner as Diversion Point No 2, refer to subsection B above for a detailed description of the spillways' application and operation. Once state waters reach Diversion Point No 3, they will pass unobstructed over the spillway into the downstream Reservoir No 3 to provide flows to existing conditions at Discharge Point No 1. By supplying Reservoir No 1 with IGO's groundwater via Pump No 1, excess water will spillover unobstructed from both Reservoir No 1 and Reservoir No 2 so Reservoir No 3 is maintained at normal pool elevation. At normal maximum operating level, Pump No 1 will maintain Reservoir No 3 with a surface area of 0.216 acres and a volume of 1.516 acre-feet.

D. Transport of State Waters in the Bed and Banks of an unnamed tributary of Stewart Creek to Discharge Point No 1

Discharge Point No 1 is located at the downstream end of Reservoir No 3 (Latitude 33.119667° N and Longitude 96.826125° W), refer to Attachment 5 in Exhibit 4 for a USGS Topographic Map of this location. Discharge Point No 1 is a proposed outlet structure that allows for all state water and additional groundwater to pass downstream into the existing unnamed tributary of Stewart Creek at flows exceeding existing conditions; waters will pass at a rate of .0432 acre feet per day. All flows from Reservoir No 3 will pass unobstructed through the outlet structure, Discharge Point No 1, into the existing channel for downstream water right's holders and the environment.

IV. INFORMATION RELATED TO APPLICATION

With this bed and banks permit, IGO requests to temporarily divert and subsequently convey all state water through IGO's proposed detention pond and spillway system. With this bed and banks application, IGO also requests permission to discharge their privately owned groundwater into the proposed detention pond system and thus the unnamed tributary of Stewart Creek in order to ensure water will not be lost due to evaporation and that waters are passed downstream.

AUTHORIZATION FROM LOCAL GROUNDWATER CONSERVATION DISTRICT: IGO has submitted the required well registration application to the North Texas Groundwater Conservation District ("NTGCD"), the local groundwater conservation district with jurisdiction over the groundwater wells for this project and on IGO's property, The Gate. IGO anticipates approved authorization from NTGCD within 2 – 3 weeks following the submission of this Bed and Banks permit application. Once IGO receives a notice to proceed from NTGCD, a copy of the notice will be sent separately to TCEQ for review. See Exhibit 13 for well authorization supporting documentation. As required by NTGCD, all exempt and non-exempt wells must be registered. By NTGCD's definition, each of IGO's proposed wells are classified as exempt wells since they are not capable of producing 25 gallons per min and thus are not required to be metered; refer to Exhibit 16 for NTGCD legislation regarding well

classification and exemption. Although meters are not required to be installed on IGO's proposed wells, in order to accurately measure their groundwater production and discharge rate into the proposed detention pond system IGO will record and report these rates for the first 4 weeks following their construction.

ANALYSIS OF EXISTING FLOW CONDITIONS: There is an ephemeral and an intermittent segment of the unnamed tributary to Stewart Creek located on IGO's proposed site. Refer to Attachment C in Exhibit 10 for additional information on the existing tributary conditions. Refer to Figure 3 in Attachment C for aerial images of these streams. The ephemeral segment, SC-ES1, has flowing water for brief periods of time in response to large rain events. SC-ES1 has been determined to be non-permanent non-navigable waters. This segment normally remains dry and during times of drought has no flow. In this area, during a storm event rainfall runoff is conveyed via overland flow through a series of emergent wetlands. The intermittent segment, SC-IS1, represents the secondary branch of the unnamed tributary to Stewart Creek and flows only during certain times of the year. Based on field observations SC-IS1 has flowing water in portions of its channel, but has significant areas of ponded water. As stated in the Attachment C in Exhibit 10, a beaver dam in the northern channel seems to be impounding this segment in the 2013 aerial versus the 2007 and 2011 aerials. The largest beaver dam is located at the confluence of the two stream segments and is the primary reason for the discontinuous nature of these streams. The dams have reduced flows over the recent years, so in order to determine existing flows IGO performed a site visit in which existing flows were calculated. IGO used the float or cross-sectional method to measure the existing tributary's flow rate. Refer to Exhibit 18, Environmental Protection Agency's (EPA's) Volunteer Stream Monitoring – 5.1 Stream Flow, for a detailed guide of this methodology and a Table of collected data. IGO's proposed detention pond will provide a system in which state waters will be conveyed continuously downstream as opposed to a significant amount of water being dammed. Due to the rate of existing flow, it is reasonable to conclude IGO's applications will only result in positive effects for downstream water rights holders by conveying waters through the proposed system.

ANALYSIS OF EVAPORATION LOSSES: IGO's property is located within the City of Frisco; Frisco's Design Manual refers to the North Central Texas Council of Government's (NCTCOG) Integrated Stormwater Management (iSWM) Technical Manual for current recommended practices for estimating annual evaporation rates, refer to Exhibit 7 for a copy of NCTCOG's iSWM Manual on hydrology. The iSWM Manual states total annual evaporation values can be estimated from Figure 4.1 and distributed according to Table 4.3 found in Exhibit 7 of this report. Table 4.3 gives pan evaporation rate distributions for a typical 12 month period based on pan evaporation information for Grapevine, Texas. Figure 4.1 depicts a map of annual free water surface (FWS) evaporation averages for Texas based on a National Oceanic and Atmospheric Administration (NOAA) assessment done in 1982. FWS evaporation differs from lake evaporation for larger and deeper lakes, but it can be used as an estimate for the type of structural stormwater ponds and wetlands being designed in Texas. Total annual evaporation rates were estimated using this map and distributed according to Table 4.3, refer to Exhibit 6 for a calculation summary of estimated

evaporation losses attributable to keeping each reservoir functioning at normal pool elevation. Although IGO's pumping system will ensure no state waters will be stored at any time, IGO has used these calculations as a conservative estimate of losses due to evaporation. Column (3) from the analysis of evaporation losses table in Exhibit 6 gives the total estimated evaporation loss in acre-feet and is calculated by taking the average annual evaporation rate of 65 inches per year and dividing that by 365 days to get an average evaporation loss of 5.42 inches per day or 0.015 feet per day; this number was then multiplied by the maximum surface area of each reservoir when at operating at normal pool elevation, Column (1). The total evaporation loss based on a daily average is 0.0068, 0.0130 and 0.0032 acre-feet for Reservoir No 1, Reservoir No 2 and Reservoir No 3 respectively. Column (4) was calculated similarly using evaporation approximated for July, when rates are projected to be the highest, at 0.7854 feet per day or 0.0253 inches per day. Using this value Reservoir No 1, Reservoir No 2 and Reservoir No 3 were estimated to have a total daily evaporation loss of 0.0117, 0.0222 and 0.0055 acre-feet respectively. IGO calculated Column (6) in Table 2 by multiplying the daily evaporation loss in July, Column (4), by 30 days and then dividing it by the maximum surface area of each reservoir, Column (1). Once the depth of water lost in one month due to evaporation was solved for each reservoir, the total volume of water lost in one month due to evaporation was calculated by multiplying the surface area of each reservoir. Both Pump No 1 and Pump No 2 will have a maximum discharge rate of 20 gallons per minute, using this discharge rate the time needed for the pump to run to compensate for evaporation in the reservoirs was determined by dividing column (6) by the pump rate. It was calculated to take approximately 10.67 hours a day for 7 days a week using July's evaporation rate, thus Pump No 1 will be sufficient to provide enough groundwater into the system to make-up for evaporation losses even in the most critical months. Applying the same methodology but using the average daily evaporation loss, Column (3), the time needed to pump water to compensate for evaporation loss will be approximately 6.25 hours a day for 7 days a week; these calculations can be found in Table 3 in Exhibit 6. Refer to the Groundwater Pumping System section below for additional information. Using the same method, the existing channel's evaporation was calculated to have an average daily rate of 0.0148 acre-feet and 0.0253 acre-feet in July.

A study was conducted by USGS in 2012 that did an estimation for 5 reservoirs in Texas with Benbrook Lake being the closest to IGO's proposed site. As shown in Table 6 found on the following page, their estimated averages had a maximum value of 60 inches per year in 2006, somewhat less than the average calculated using the iSWM Manual's method. In order to be more conservative, IGO will use the iSWM Manual's method to calculate projected evaporation rates.

ADDITIONAL STATEMENT OF IGO – USA, LP's APPLICATION TO CONVEY WATER IN BED AND BANKS IN COLLIN COUNTY

Table 6. Percentage error between unmodified and modified Hamon and modified U.S. Weather Bureau method estimates of annual reservoir evaporation with annual reservoir evaporation from the sum of published monthly Class A pan data and application of Texas Water Development Board monthly pan coefficients for five Texas reservoirs, 2001–10.

[USWB, U.S. Weather Bureau; --, indicates not applicable or data not available; bold values indicate precentage errors less than or equal to 20 percent]

Reservoir	Year	Number of months[1]	Annual reservoir evaporation (A) (inches)	Unmodified Hamon (B) (inches)	Unmodified Hamon percentage error[2] ([B-A]/A) *100)	Modified Hamon (C) (inches)	Modified Hamon percentage error[2] ([C-A]/A) *100)	Unmodified USWB (D) (inches)	Unmodified USWB percentage error[2] ([D-A]/A) *100)	Modified USWB (E) (inches)	Modified USWB percentage error[2] ([E-A]/A) *100)
Benbrook Lake	2004	12	49.02	39.22	-20.0	53.46	9.0	45.15	-7.9	45.42	-7.3
	2005	11	55.38	40.20	-27.4	52.97	-4.4	50.60	-8.6	51.46	-7.1
	2006	11	60.19	42.16	-30.0	55.31	-8.1	59.56	-1.0	59.33	-1.4
	2007	11	44.96	37.92	-15.7	50.68	12.7	42.04	-6.5	42.87	-4.6
	2008	12	57.91	40.60	-29.9	54.49	-5.9	57.89	-0.0	58.53	1.1
	2009	10	47.19	38.39	-18.7	48.79	3.4	51.29	8.7	50.20	6.4
	2010	8	42.38	35.87	-15.4	42.79	1.0	48.12	13.5	46.48	9.7
	Average error[3]	--	--	--	22.4	--	6.4	--	6.6	--	5.4

GROUNDWATER PUMPING SYSTEM: IGO's pumping system will consist of one primary pump, Pump No 1, running at 60 psi for a maximum of 11.74 hours a day for 7 days a week during the month with the most evaporation losses. On average, Pump No 1 will run approximately 6.9 hours a day for 7 days a week. Pump run time was calculated to account for evaporation losses as well as 10% of evaporation losses to keep water flowing downstream; refer to the tables found in Exhibit 6 for detailed pump calculations. Table 2 reflects the maximum discharges and time IGO anticipates for the pump to run since these calculations were performed using evaporation rates for July, the hottest month documented in Table 1. The maximum rates were presented to ensure IGO's pumping system can provide enough groundwater to keep water flowing downstream in even the most critical months. Table 3 reflects the average discharges and time IGO anticipates for the pump to run. Both tables were calculated similarly, but are based in different evaporation rates. Column (9) represents the additional amount of groundwater discharged to provide for water to continuously flow downstream during the most critical months and was calculated by multiplying Column (4) by 0.10. Column (10) represents the maximum groundwater expected to be pumped by Pump No 1 during critical months and was calculated by adding Column (9) to Column (4). Column (11) was calculated similarly by multiplying Column (8) by 0.01 and Column (12) was calculated by adding Column (11) to Column (8). Both pumps will run with a maximum rate of 20 gallons per minute and can produce approximately 28,800 gallons over a 24 hour period. Both wells will be approximately 900 feet deep and will pump groundwater from the Woodbine Aquifer. In addition to the pumping information provided in Exhibit 12, IGO has provided historical pump testing information for similar pumps within the vicinity also using the Woodbine Aquifer. Refer to Exhibit 14 for Historical Pump Data of these nearby wells; a map of each well location can be found in Attachment 7 of Exhibit 4. The pumping system will operate via the

float located in Reservoir No 3 that will detect when the water in the reservoir is beginning to become below normal pool elevation. The float will act as a sensor; when Reservoir No 3 falls below normal pool elevation it will then signal Pump No 1 (Discharge Point No 2) to begin discharging groundwater into Reservoir No 1 until water passes unobstructed over each spillway and subsequently Reservoir No 3 is filled back to normal pool elevation. Once normal operating level is met, all waters will pass to Discharge Point No 1 located downstream of Reservoir No 3 at which waters will be discharged into the existing channel exceeding existing flow conditions at an average rate of 0.0035 acre-feet per day or 1.290 acre-feet per year. Only the volume of water necessary to keep each reservoir at normal pool elevation and flowing downstream will be discharged into the state watercourse, avoiding any waste that might otherwise occur if excess water volumes were delivered to the reservoirs. As previously stated, the volume of groundwater pumped into Reservoir No 1 will be determined by the float device and is directly dependent on keeping Reservoir No 3 operating at normal pool elevation. Refer to the tables in Exhibit 6 for a summary table of the evaporation loss and corresponding pump calculations used in determining the amount and rate of water needed to keep all reservoirs operating at normal pool elevation. Groundwater discharged from Pump No 2 (Discharge Point No 3) will be will be used directly from Well No 2 and be primarily used for irrigating approximately 2 acres of IGO's property. Pump No 2 has the same specifications as Pump No 1; it will run at a maximum discharge rate of 20 gallons per minute at 60 psi. The amount of groundwater used for irrigation purposes was calculated using the assumption 1 inch of water will be used per week to irrigate approximately 2 acres. Refer to Attachment 6 in Exhibit 4 for a map of the area to be irrigated. This is equivalent to approximately 225,908 gallons per month or 0.02311 acre-feet per day. In the event Pump No 1 (Discharge Point No 2) malfunctions, the control system will shift Pump No 2's (Discharge Point No 3's) function from irrigation to discharging groundwater into Reservoir No 1 as needed to keep Reservoir No 3 at normal pool elevation and thus provide flow into the existing tributary at Discharge Point No 1.