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October 22, 2010

Via Hand Delivery

Ms. LaDonna Castañuela, Chief Clerk
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. F
Austin, Texas 78753

Re: SOAH DOCKET NO. 582-09-3064/TCEQ DOCKET NO. 2008-1888-UIC
- consolidated with -
SOAH DOCKET NO. 582-09-6184/TCEQ DOCKET NO. 2009-1319-UIC
Exceptions re: Application of Uranium Energy Corp
for Permit No. UR03075 and for Aquifer Exemption and for
Production Area Authorization UR03075PAA1 in Goliad
County, Texas

CHIEF CLERKS OFFICE
2010 OCT 22 PM 4:25
TEXAS COMMISSION
ON ENVIRONMENTAL
QUALITY

Dear Ms. Castañuela:

Enclosed for filing is the original and eight (8) copy of the following document:

- **APPLICANT URANIUM ENERGY CORP'S EXCEPTIONS TO PROPOSAL FOR DECISION**

Please return a file-marked copy with our waiting courier. If you have any questions, please contact Monica Jacobs at the number listed above.

Sincerely yours,



Stacey Supak-Diaz
Legal Secretary to Monica Jacobs
Phone: (512) 495-6403

Enclosures

cc: Jim Blackburn
Rob Baiamonte
Shana Horton

Garrett Arthur
Pat Calhoun

APPLICATION OF
URANIUM ENERGY CORP
FOR PERMIT NO. UR03075,
AND FOR AQUIFER EXEMPTION
AND FOR PAA-1
IN GOLIAD COUNTY, TEXAS

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BEFORE THE STATE OFFICE
OF ADMINISTRATIVE
HEARINGS

2010 OCT 22 PM 4:26
CHIEF CLERKS OFFICE

TEXAS
COMMISSION
ON ENVIRONMENTAL
QUALITY

APPLICANT URANIUM ENERGY CORP'S
EXCEPTIONS TO PROPOSAL FOR DECISION

COMES NOW Uranium Energy Corp ("UEC") and files these Exceptions to the Proposal For Decision ("PFD") issued by the Administrative Law Judge ("ALJ") on September 28, 2010, and in support thereof respectfully shows the Texas Commission on Environmental Quality (the "commission") the following:

I.

INTRODUCTION

A. The Mine Application and Aquifer Exemption Request

On August 9, 2007, UEC filed an application for a Class III Underground Injection Control area permit, Permit No. UR03075, and aquifer exemption (collectively, the "Mine Application").¹ By its Mine Application, UEC seeks a Class III area permit (the "Mine Permit") and an Aquifer Exemption Order from the commission related to a proposed uranium mining facility located in Goliad County, approximately 13 miles north of the city of Goliad.

¹ Holmes Direct Testimony, p. 24, ll. 9-10; Murry Testimony, p. 4, ll. 35-36; see Exhibit UEC-Holmes 13 (Mine Application).

B. The PAA Application

On September 4, 2008, UEC filed an application for a Production Area Authorization (“PAA”) to authorize UEC to construct and operate Class III injection and production wells for the recovery of uranium in proposed Production Area 1 (“PA-1”) within the Mine Permit Area.² Such application will be referred to herein as the “PAA-1 Application.” The Mine Application and the PAA-1 Application will be referred to collectively as the “Applications.”

C. The Draft Permits

The Executive Director made a preliminary determination that the Applications meet all applicable statutory and regulatory requirements for issuance of a mine permit, aquifer exemption order, and production area authorization for PA-1.³ On June 4, 2008, TCEQ staff issued a draft Mine Permit and a draft Aquifer Exemption Order.⁴ On June 9, 2009, TCEQ staff issued a draft PAA-1.⁵

D. The Contested Case Hearing

On March 3, 2009, the commission referred twenty-one disputed issues of fact (“Issues”), which had been raised in public comments regarding the Mine Application, to the State Office of Administrative Hearings (“SOAH”) for a hearing on the merits.⁶ On August 14, 2009, the PAA-

² Holmes Direct Testimony, p. 79, ll. 16-17; Murry Testimony, p. 14, ll. 12-13; *see* Exhibit UEC-Holmes 20 (PAA-1 Application).

³ Holmes Direct Testimony, p. 25, ll. 1-4; p. 80, ll. 5-9; Murry Testimony, p. 5, ll. 14-19; p.7, l. 16 – p. 8, l. 30, & p. 14, l. 27 – p. 16, l. 19; Exhibit UEC-Holmes 10 (containing the Technical Summary and ED’s Preliminary Decision regarding the Mine Application); Exhibit UEC-Holmes 18 (containing the Technical Summary and ED’s Preliminary Decision regarding the PAA-1 Application); *see also* Executive Director Exhibit 5 (containing the Technical Summary and ED’s Preliminary Decision regarding the Mine Application); Executive Director Exhibit 14 (containing the Technical Summary and ED’s Preliminary Decision regarding the PAA-1 Application).

⁴ Murry Testimony, p. 8, ll. 6-10; Exhibit UEC-Holmes 11 (containing the draft Mine Permit); Executive Director Exhibit 7 (containing the draft Aquifer Exemption Order); *see also* Executive Director Exhibit 6 (containing the draft Mine Permit).

⁵ Murry Testimony, p. 18, ll. 7-11; Exhibit UEC-Holmes 19 (containing the draft PAA); Executive Director Exhibit 18 (containing the draft PAA).

⁶ TCEQ Interim Order issued March 3, 2009, at pp. 2-5.

1 Application was directly referred to SOAH for a contested case hearing on whether it complied with all applicable statutory and regulatory requirements.⁷

To fully address each of the twenty-one Issues referred by the commission with respect to the Mine Application and the regulatory compliance of the PAA-1 Application, UEC presented the testimony of nine expert witnesses: Dr. Philip Bennett, a hydrogeologist and geochemist; Dr. Daniel W. Erskine, a geochemist; Dr. William Galloway, a geologist with special expertise related to the formation of uranium ore bodies and faulting associated with those ore bodies; Craig W. Holmes, a uranium mining regulatory specialist; Van Kelley, P.G., a hydrogeologist and expert in hydrogeological modeling; John J. Kuhl, an ecologist with special expertise in endangered species, land use, and wetlands; Derek E. Naiser, P.E., an engineer with special expertise in surface water control and roadway engineering; John C. Reagor, Ph.D, a veterinary toxicologist and longtime head of the Texas Veterinary Medical Diagnostic Laboratory at Texas A&M University; and William Robert Underdown, Jr., an engineer and uranium mining operations specialist. Collectively, UEC's expert witnesses submitted 487 pages of prefiled testimony and 110 exhibits.

The Executive Director presented the testimony of David Murry, P.G., a licensed professional geologist with thirty-one years of experience who was responsible for reviewing the Applications for consistency with the applicable requirements of the commission's rules.⁸

Goliad County and the Goliad County Groundwater Conservation District (collectively, the "Protestants") attacked the Applications on numerous, often inconsistent grounds.

⁷ Holmes Direct Testimony, p. 80, ll. 17-18; Executive Director Exhibit 17, p. 5; *see* 30 TAC § 55.210 (providing that the Executive Director or the applicant may file a request with the chief clerk for a direct referral to SOAH and that, after receipt of such a request and after the Executive Director has issued his preliminary decision, the chief clerk shall refer the application directly to SOAH for a hearing on the application).

⁸ Murry Testimony, p. 1, l. 5 – p. p. 2, l. 31; p. 4, l. 30 – p. 5, l. 22; p. 7, l. 28 – p. 8, l. 8; p. 14, ll. 7-11; p.

Collectively, the Protestants presented the testimony of five expert witnesses: Thomas Neil Blandford, P.G., a hydrologist; Dr. Richard J. Abitz, a geologist and geochemist; Dr. Bruce Darling, a geologist; Dr. Ronald Sass, a chemist; and Dr. H.C. Clark, a geologist and geophysicist.

The hearing on the merits began on May 3, 2010, and concluded on May 11, 2010. The hearing included seven days of live testimony, including extensive cross-examination of UEC's expert witnesses.

D. The Proposal for Decision (PFD)

After reviewing the voluminous prefiled record and closing arguments, the ALJ reached the following conclusions, among others:

The ALJ ... finds that UEC's mining operation and restoration activities will not unreasonably reduce the amount of groundwater available for permitting by the District.⁹

Considering all the evidence, the ALJ concludes that the ED properly determined that UEC's Mine Application is in the public interest consistent with the policy of the state as defined by the Legislature.¹⁰

UEC's compliance history does not require denial of UEC's Mine Application under TEX. WATER CODE § 27.051(a) and 30 TAC ch. 60.¹¹

For purposes of the Mine Application the ALJ finds that the application adequately describes the baseline groundwater conditions.¹²

18, ll. 7-11; Executive Director Exhibit 2 (Mr. Murry's resume).

⁹ PFD, p. 22.

¹⁰ *Id.*, p. 24; *see also id.*, p. 22 ("The ALJ finds that UEC's proposed installation and use of Class III injection wells for *in situ* mining of uranium are in the public interest, in accordance with the criteria in TEX. WATER CODE § 27.051(a).").

¹¹ *Id.*, p. 27; *see also id.*, p. 32 ("Based on consideration of the entire record, the ALJ finds that Protestants have failed to show by a preponderance of the evidence that UEC has exhibited a recurring pattern of conduct that demonstrates a consistent disregard for the regulatory process, including a failure to make timely and substantial attempt to correct the violations, as required by TCEQ rules.").

¹² *Id.*, p. 36; *see also id.*, p. 33 ("To the extent that the Class III application includes information regarding water quality for the purpose of providing a general idea of the quality of the water within the area that UEC proposes to mine, the Class III application adequately and accurately describes the pre-mining groundwater quality.").

The Mine Application satisfies the requirements of 30 TAC § 331.122.¹³

The ALJ finds that the preponderance of the evidence supports the conclusion the UEC has demonstrated that the proposed exempted aquifer meets the applicable criteria of 30 TAC § 331.13.¹⁴

UEC's expert witnesses presented a wealth of information about the geology and hydrology of the area, including the areas within and surrounding the proposed mine site.¹⁵

The preponderance of the evidence was that two faults exist within the proposed mine permit area: the Northwest Fault and the Southwest Fault.¹⁶

[With regard to] the location of the Northwest Fault . . . Dr. Bennett and his colleagues in the lineup of UEC experts were able to rely on public information about the stratigraphic offset of correlative beds as shown by the cross-sections of the local geology. Goliad County's questions raised questions about the accuracy and reliability of that information. But, neither the questions nor the evidence provided by Protestants were sufficient to overcome UEC's evidence on that point.¹⁷

UEC satisfies the requirements for financial assurance under TEX. WATER CODE §§ 27.051 and 27.073, and 30 TAC chs. 37 and 331.¹⁸

UEC's Mine Application is sufficiently protective of surface water quality.¹⁹

The ALJ further finds that any concerns regarding possible migration of constituents from a production area in Sand A to Fifteen Mile Creek can be appropriately addressed in connection with the PAA application process for Sand A.²⁰

Local roadways are sufficient to handle traffic to and from the proposed mine site.²¹

UEC's proposal for restoration of groundwater to baseline levels is reasonable and adequate, provided that the proposal for restoration is applied to achieve

¹³ *Id.*, p. 36; *see also id.*, p. 39.

¹⁴ *Id.*, p. 44; *see also id.*, p. 40 (“UEC has demonstrated that the proposed exempted aquifer meets the criteria of 30 TAC § 331.13.”).

¹⁵ *Id.*, p. 52.

¹⁶ *Id.*, p. 53.

¹⁷ *Id.*, pp. 53-54.

¹⁸ *Id.*, p. 57.

¹⁹ *Id.*, p. 68.

²⁰ *Id.*, p. 73.

²¹ *Id.*, p. 74.

baseline water quality corresponding to the average of all three rounds of baseline sampling for all constituents.²²

The ALJ finds that the Protestants' forecast of inevitable restoration failure and disavowal of the existence of improved restoration technologies are contrary to the preponderance of credible evidence.²³

UEC's proposed *in situ* uranium mining activities will not negatively impact livestock and wildlife, including endangered species.²⁴

The clear preponderance of the evidence proves that UEC's proposed uranium mining activities will not negatively impact the use of property.²⁵

UEC's proposed *in situ* mining activities will not adversely affect public health and welfare.²⁶

UEC's proposed *in situ* uranium mining is not within the recharge [zone] of the Gulf Coast Aquifer (Evangeline component).²⁷

The ALJ finds the testimony of Dr. Bennett most persuasive that the proposed uranium mining is not within the recharge zone of the Gulf Coast aquifer.²⁸

The ALJ finds that the preponderance of the evidence confirms that Sands B, C, and D, are confined and Sand A is unconfined. Although no statute or rule prohibits *in situ* mining in an unconfined aquifer, the ALJ notes the ED's stated intention, if and when UEC submits a PAA application to mine Sand A, to fully evaluate the unconfined nature of Sand A and establish monitoring and operational requirements appropriate for that condition.²⁹

UEC's proposed methods of confinement have long been supported by the ED and accepted by the Commission.³⁰

The use of a bleed is well-established as a method of forcing mining solutions to seek a nearby and maintained down-gradient point of exit. . . . [I]n the end, the Protestants' evidence was more in the nature of questions, challenges to

²² *Id.*, p. 76.

²³ *Id.*, p. 86.

²⁴ *Id.*, p. 87.

²⁵ *Id.*, p. 94; *see also id.*, p. 90 ("UEC's proposed *in situ* uranium mining activities will have no substantial negative impact on the use of property.").

²⁶ *Id.*, p. 94.

²⁷ *Id.*, p. 96.

²⁸ *Id.*, p. 104.

²⁹ *Id.*, p. 108; *see also id.*, p. 104 ("Sand B, where UEC proposes to commence mining, and Sands C and D are confined.").

³⁰ *Id.*, p. 117.

sufficiency, rather than persuasive evidence that these methods were not sufficient. Thus, the ALJ concludes the preponderance of the evidence supports UEC's position, as supported by the ED's testimony.³¹

The use of monitor well rings is another of the well-established processes that have been used in other *in situ* mines in Texas. Although the parties similarly disagreed on some of the technical details associated with the monitoring of the data, UEC's evidence on this point was not effectively challenged by the Protestants.³²

[With regard to] whether the boreholes compromised the natural protections of the existing geologic and hydrologic formations...., [t]he preponderance of the evidence is that the mine will be monitored carefully by UEC and will be subject to scrutiny by the ED during the initial phases of its development.³³

There is no practicable, economic and feasible alternative to an injection well reasonably available within the meaning of TEX. WATER CODE § 27.051(d)(2).³⁴

Considering the totality of the evidence the ALJ finds that the control parameter upper limits proposed by UEC and contained in the draft PAA comply with the applicable statutory and regulatory requirements.³⁵

The ALJ finds there is no real dispute as to whether UEC's proposed monitoring well system satisfies the applicable statutory and regulatory requirements. Moreover, based on the preponderance of the evidence the ALJ finds unpersuasive the Protestants' position that there should be a greater number of monitor wells located in closer proximity.³⁶

The ALJ also recommended that the issuance of the Mine Permit—and therefore, by extension, PAA-1—be contingent upon a limited remand for the purpose of gathering further evidence regarding the transmissivity of the Northwest Fault. The ALJ found that two qualified and experienced experts—Dr. Philip Bennett and Mr. David Murry³⁷—provided somewhat

³¹ *Id.*, p. 117.

³² *Id.*, p. 117.

³³ *Id.*, pp. 117-18.

³⁴ *Id.*, p. 123.

³⁵ *Id.*, p. 131.

³⁶ *Id.*, p. 133.

³⁷ PFD, at p. 56 (noting that the ALJ does not question the credibility of either Dr. Bennett or Mr. Murry and that “each is an expert in his field, and each has reviewed many pump tests in the course of his career.”).

conflicting testimony about one piece of the evidence regarding the transmissivity of the Northwest Fault. Specifically, the testimony concerned whether a graphical representation of numerical data from one of the two sets of fault pump tests appeared to show some transmissivity across the fault at a particular location in one of the four sands proposed to be mined. Although a limited remand for this purpose is certainly procedurally feasible under the commission's rules,³⁸ such a remand is not desirable because, as explained further in Section II of these Exceptions, there is no regulatory requirement that such a test be conducted at this stage in the permitting process, and no additional environmental benefit or protection will result from such a test at this stage in the permitting process.

The ALJ also recommended a change to the restoration table in the draft PAA-1 and raised the possibility of a related change to the amount of financial assurance to be posted by UEC in connection with the draft PAA-1. These recommended changes are addressed in Section III of these Exceptions. At this time, the ALJ has not issued proposed findings of fact and conclusions of law. In Section IV of these Exceptions, UEC requests that the commission adopt and enter the attached proposed findings of fact and conclusions of law, which have been revised slightly to more closely conform to the contents of the PFD and these Exceptions.

³⁸ 30 TAC § 80.265 (“The commission, on the motion of any party or on its own motion, may order the judge to reopen the record for further proceedings on specific issues in dispute. The commission's order shall include instructions as to the subject matter of further proceedings and the judge's duties in preparing supplemental materials or revised orders based upon those proceedings for the commission's adoption.”).

II.

THE ALJ'S RECOMMENDATION THAT UEC BE ORDERED TO CONDUCT AN ADDITIONAL PUMP TEST AROUND THE NORTHWEST FAULT

A. The Evidence is Undisputed That There is No Statute or Rule Requiring UEC to Conduct a Pump Test Around the Northwest Fault to Obtain the Mine Permit or PAA-1.

A mine permit is only one in a series of permits and authorizations that a uranium mining company must obtain prior to commencing mining operations;³⁹ a mine permit on its own does not authorize the permit holder to commence mining operations. Rather, before commencing mining operations, a mining company must obtain a TCEQ Class I waste disposal permit,⁴⁰ a TCEQ radioactive material license ("RML"),⁴¹ a TCEQ air quality Permit-by-Rule ("PBR"),⁴² a Jurisdictional Determination to Section 404 of the Clean Water Act, an Acknowledgment of No Significant Impact on Ecology from the Texas Department of Parks and Wildlife, a Cultural Resources Assessment from the Texas Historical Commission, and a Non-endangerment of Oil and Gas Resources Assessment, in addition to a PAA for the particular production area that the company is proposing to mine.⁴³ Under the commission's regulations, to obtain a PAA, an applicant must (1) conduct a pump test that involves pumping wells within the production area while measuring responses in the wells comprising the monitor well system for that production area, and (2) submit this pump test data and

³⁹ Holmes Direct Testimony, p. 5, l. 20 – p. 6, l. 9; *see also* Exhibit UEC-Holmes 2 (diagram summarizing the various agency approvals needed to begin mining operations).

⁴⁰ Holmes Direct Testimony, p. 16, ll. 18-22 (explaining that in the in situ uranium mining context, a Class I well is an injection well used to inject and dispose of byproduct waste fluids deep underground).

⁴¹ *See* 30 TAC §§ 336.1 – 336.1317. In the context of uranium mining, an RML is a license that authorizes the possession, receipt, processing, and temporary storage of natural uranium prior to transfer to authorized recipients. *Id.* § 336.1, 336.211. An RML also authorizes temporary storage of byproduct material (waste) prior to transfer to authorized recipients and authorized disposal facilities. *Id.* § 336.1101.

⁴² *See* 30 TAC § 106.1; Holmes Direct Testimony, p. 22, ll. 17-18.

⁴³ ED Exhibit 10, Response 25, p. 20 (explaining that a production area authorization "is needed to mine

accompanying analysis as a part of its application for a PAA.⁴⁴ There is no applicable regulation requiring an applicant to conduct a pump test (or any other hydrologic testing) to obtain a mine permit.⁴⁵

In UEC's case, its Mine Application identifies three potential production areas (PA-2, PA-3, and PA-4) in addition to the PA-1 that is at issue in this proceeding. Unlike PA-1, each of these three production areas straddles or abuts the Northwest Fault.⁴⁶ As one of the Protestants' experts correctly noted, production in PA-1 will not involve the Northwest Fault.⁴⁷ Importantly, UEC cannot commence mining operations in *any* of these three production areas unless and until it designs and installs a monitor well system around the production area, conducts a pump test designed to show that the monitor well system is in hydraulic communication with the area to be mined, submits the results of the pump test as a part of a PAA application, and obtains its PAAs from the commission.

At this time, the only production area for which UEC is seeking a PAA is PA-1. In connection with the PAA-1 Application, UEC conducted two pump tests per the applicable regulations, which are referred to as the PTW-1 Pump Test and the PTW-6 Pump Test. The results of these tests were interpreted by a hydrologist who drafted a report regarding the tests that was submitted and reviewed as a part of the PAA-1 Application. This technical report allowed the agency (and the ALJ) to evaluate the hydrologic properties associated

an ore body within a permit area"); Holmes Direct Testimony, p. 15, ll. 4-8.

⁴⁴ ED Exhibit 10, Response 25, p. 20 (citing 30 TAC § 305.49(B)(6)); Exhibit UEC-Holmes 40, p. 8 (providing instructions for a PAA application technical report).

⁴⁵ Murry Cross-Examination, Transcript, p. 1334, ll. 15-17; ED Exhibit 10, Response 25, p. 20.

⁴⁶ See e.g., Exhibit UEC-Holmes 14, and PFD, p. 53 (noting that "[t]he Northwest Fault is the larger of the two [faults] and runs along the northwest portion of the proposed mine site, near the perimeter of proposed production areas A and C and very near the perimeter of D.").

⁴⁷ Clark Testimony, p. 24, ll. 13-16 ("The first production area is located in the middle of the site, and in that respect is a pretty good candidate for beginning the mining project. It is not directly involved with the Northwest Fault, and seems to have a continuous clay layer above and below, at least over the area

with the proposed PA-1 and its monitoring well ring. This evaluation process worked effectively with respect to PA-1, and it will work in due course with the remaining production areas.

B. UEC Conducted Preliminary Northwest Pump Tests as a Part of its Long-Term Operational and Financial Planning.

Importantly, regardless of whether ordered to do the test recommended by the ALJ, UEC will still have to do the separate pump tests for the other three production areas as described above. Adding an additional pump test at this stage of the permitting process provides no added environmental benefit or protection, but does add unnecessary delay and cost.

As the record reflects, the Northwest Fault pump tests conducted to date by UEC were not undertaken to fulfill the requirements of a PAA application for any of the other three anticipated production areas. Rather, UEC took a preliminary look at the behavior of fluid around the Northwest Fault as part of its long-term operational and financial planning. As Mr. Holmes explained in his prefiled direct testimony:

Q: What was the purpose of conducting these pump tests?

A: UEC wanted to get *a preliminary idea* about whether the Northwest Fault was transmissive since much of the ore appears to be located in the vicinity of the Northwest Fault. The transmissivity or lack of transmissivity of these types of geologic features naturally affects the way that production areas are formed around them, especially in terms of the locations of monitoring wells.

Q: Why do you refer to these pump tests as being preliminary in nature?

A: As UEC develops its applications for the Sand A, C and D production areas, *additional pump tests similar to the ones conducted specifically for the PAA-1 Application will have to be conducted across and in the vicinity of the Northwest Fault.*⁴⁸

covered by the monitor wells.”).

⁴⁸ Holmes Direct Testimony, p. 64, ll. 13-22 (emphasis added).

In other words, the fault pump tests were preliminary tests that were not intended to be determinative—and indeed, in the form conducted and reported, could not be determinative—from a regulatory/permitting standpoint. Even if UEC wanted to present the Northwest Fault tests as final production area pump tests for permitting purposes, it could not do so since hydrologic test results and interpretations for production area pump tests have to be conducted to “verify hydrologic connection between the production zone and the production zone monitor wells”⁴⁹ and signed and sealed by a licensed professional geoscientist.⁵⁰ The production zone monitor wells for these three production areas have not yet been installed, and indeed, further exploratory delineation may be required before they can be completed.

Nevertheless, UEC’s preliminary assessment, although not determinative, proved to be informative and helpful for internal planning purposes. Specifically, the 24-hour pump test graph introduced into the record by the Protestants shows, as Dr. Bennett noted, that when the well designated PT-CD was pumped, there was a response in the well designated RBLC-2.⁵¹ This result is not surprising because these two wells are *located in the same sand (Sand C) and on the same side of the Northwest Fault (downdip)*.⁵² For convenience, this pump test graph⁵³ is included below:

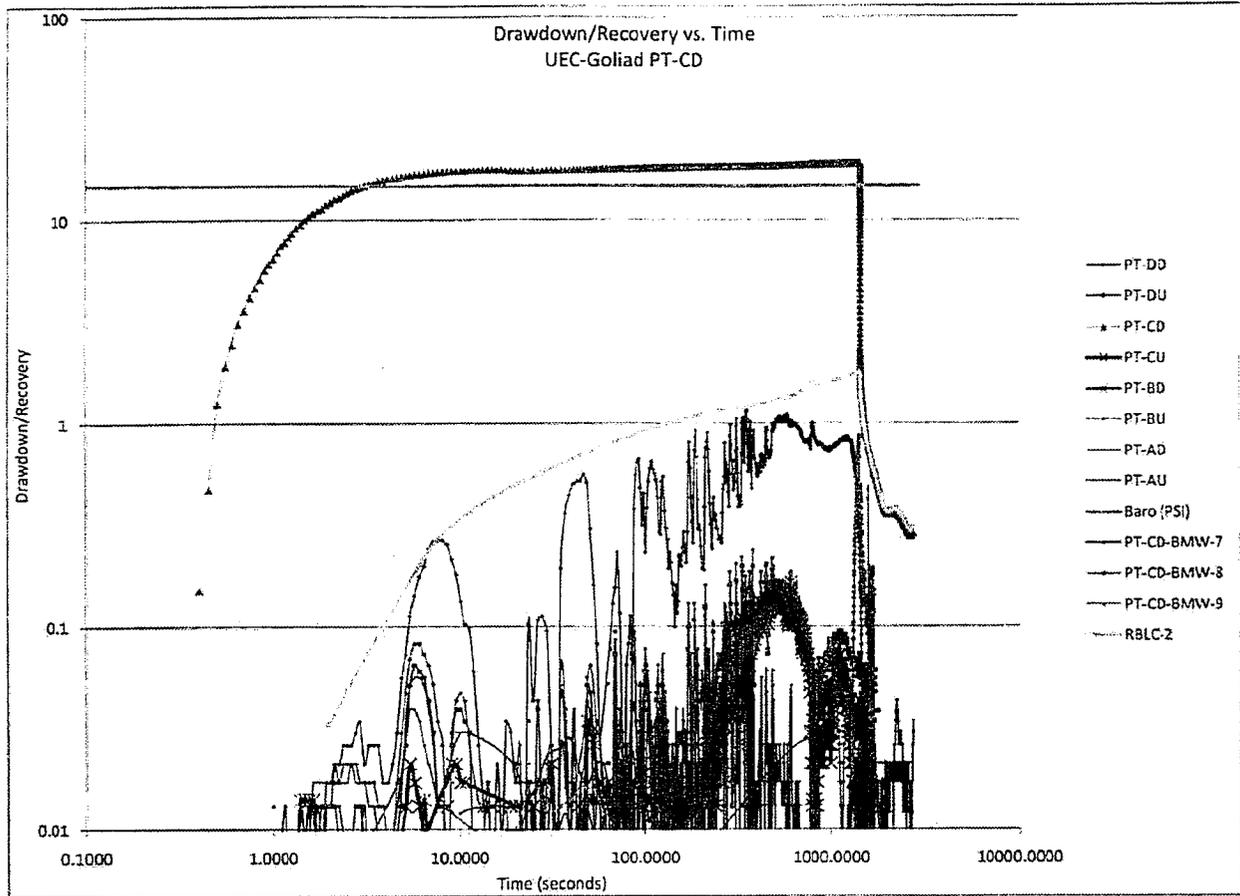
⁴⁹ Exhibit UEC-Holmes 40, p. 8 (providing instructions for a PAA application technical report).

⁵⁰ 30 TAC § 331.21.

⁵¹ *Id.* at p. 909, l. 1—p. 912, l. 24.

⁵² Exhibit UEC-Holmes 14 (showing the location of both wells).

⁵³ Goliad County Cross Exhibit 22.



As shown above, the arc of the upper-most green line maps the progress of PT-CD (the pumping well), while the light blue or periwinkle colored line below maps the progress of RBLC-2 (an observation well). Both of these wells are located in Sand C downdip from the Northwest Fault. Thus, not surprisingly, the graph shows that the progress of RBLC-2 tracks a very similar path to that of PT-CD.⁵⁴ Below the light blue or periwinkle colored line is a crowded depiction of many additional colored lines, which appear erratic and jerky as compared to the smooth arcs of PT-CD and RBLC-2. During cross-examination by the Protestants, both Dr. Bennett and Mr. Murry were repeatedly asked to attempt to interpret the meaning of this lower portion of the graph.

⁵⁴ Bennett Cross-Examination, Transcript, p. 909, l. 1—p. 912, l. 24.

C. Expert Testimony Regarding the Northwest Pump Test Data

None of the Protestants' expert witnesses submitted any testimony regarding the Northwest Pump Test Data. Rather, the only expert testimony regarding this pump test data came from the Protestants' cross-examination of Dr. Philip Bennett, a hydrogeologist and geochemist who provided expert testimony on behalf of UEC, and from the Protestants' cross-examination of Mr. David Murry, a geologist who provided expert testimony on behalf of the Executive Director. Protestants questioned both of these expert witnesses about Goliad Cross Exhibit 18, an excerpt of some data from the 24-hour Northwest Pump Tests.

1. Dr. Bennett

In his prefiled direct and rebuttal testimony, Dr. Bennett testified regarding the sealing nature of the Northwest Fault, basing his opinion on several lines of evidence, including a series of four-hour pump tests as well as the water level data discussed below. During cross-examination by the Protestants' attorneys, Dr. Bennett testified at least seven times that the "messy"⁵⁵ portion of the Exhibit 18 graph indicated a malfunctioning transducer⁵⁶ or "noise."⁵⁷ The graph had no effect whatsoever on Dr. Bennett's original opinion regarding the sealing nature of the Northwest Fault.⁵⁸

Chief among the lines of evidence relied upon by Dr. Bennett in reaching his opinion regarding the sealing nature of the Northwest Fault was water level data. Dr. Bennett elaborated upon his interpretation of this data in his rebuttal testimony:

UEC's latest work regarding the NW Fault does not change my opinion on the effect of the NW Fault on groundwater flow. The water levels in wells above and below the NW Fault show a substantial decrease in static water level elevations

⁵⁵ Murry Cross-Examination, p. 1342, ll. 7-14.

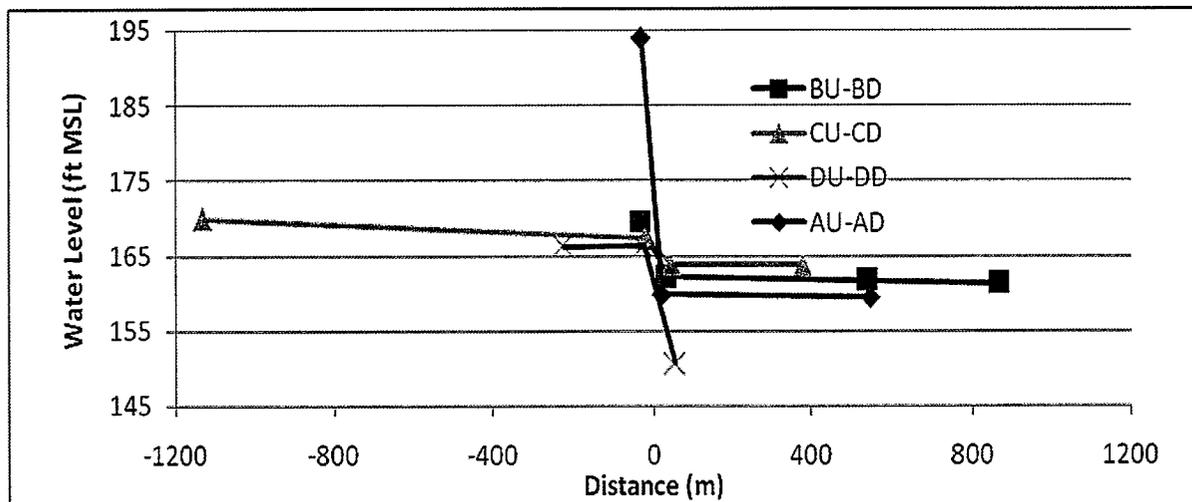
⁵⁶ Bennett Cross-Examination, Transcript, p. 910, ll. 5-6; p. 911, ll. 6-8; p. 912, ll. 21-22; p. 913, ll. 6-7; p. 914, ll. 1-2; p. 944, ll. 24-25; p. 946, ll. 5-6.

⁵⁷ *Id.* at p. 913, l. 22.

⁵⁸ UEC's Closing Argument, II.R., p. 114.

along a NW to SE line across the NW Fault. *All sand zones show a dramatic drop in water level across the fault*, with an extremely high gradient (change in water table elevation divided by distance). For the A-sand transect, the gradient approaches 0.2 across the fault, while the gradients on either side of the fault are all very small, as expected for a sandstone aquifer. *This dramatic change in gradient is encountered in a homogeneous porous media aquifer, and would only occur across a low-permeability boundary such as a fault. Since there are no underground “water falls” in granular porous media, this very steep gradient located over the fault indicates a marked decrease in hydraulic conductivity (K).* This is consistent with the stratigraphic interpretation of borehole logs on each side of the fault that show the permeable zones juxtaposed on confining zones across the fault (Cross-Section E-E’).⁵⁹

This “underground waterfall” effect is illustrated below in “a graph showing the water levels in wells above and below the NW Fault, which demonstrates the substantial decrease in static water level elevations”⁶⁰



Water levels in wells above and below the fault along a NW to SE line starting at the Anklam well and ending at BMW-17. The NW fault zone is located at distance=0. Each line represents wells in the same sand zone along the section line.⁶¹

⁵⁹ Issue G Rebuttal Testimony, Bennett, p. 9, l. 22—p. 10, l. 11.

⁶⁰ *Id.* at p. 10, ll. 15-16.

⁶¹ Exhibit UEC-Bennett 14.

2. Mr. Murry

At hearing, Mr. Murry also testified regarding the Exhibit 18 graph shown to him by counsel for the County:

I guess, the only thing I would say is we -- I looked at this data right here over a few seconds. It *seems* that, yes, that's what it *appears* to be that there is a response in "C." The only thing I can tell you is that graphs -- that's one of the most messy graphs I've ever seen. But *based on what I was shown here*, yes, it *appears* that there is communication in "C" across the fault.⁶²

In short, Mr. Murry qualified his assessment of the graph by (1) noting that his assessment was only a few seconds in duration, (2) qualifying his conclusion several times as “appearing” to be the right conclusion based on the one page he was shown, and (3) commenting that the graph was “one of the most messy graphs [he’d] ever seen.” Even with those qualifications, Mr. Murry testified only that there *appeared* to be some horizontal communication across the fault in Sand C. It is significant and notable that neither Dr. Bennett nor Mr. Murry—correctly characterized by the ALJ as credible and experienced experts—chose to alter their expert opinions in this case in light of the 24-hour pump test graph.

It is also notable that the evidentiary record shows that the extent of any horizontal communication depicted on the 24-hour pump test graph is minuscule. On the Exhibit 18 graph shown above, the thick purple line represents a well designated as PT-CU. Like PT-CD and RBLC-2, PT-CU is located in Sand C. Unlike PT-CD and RBLC-2, PT-CU is located updip from the Northwest Fault. This thick purple line is very difficult to track among all of the other lines that converge along the bottom portion of the graph. However, the data accompanying the Exhibit 18 graph⁶³ show numerically what the graph shows visually. Excerpts from the table of data are summarized in the table below; the references to pages and line numbers are the pages

⁶² Murry Cross-Examination, p. 1342, ll. 7-14 (emphasis added).

⁶³ Goliad County Cross Exhibit 22.

and lines at which the cited data is found in the County's exhibit.

Time (minutes)	PT-CD	RBLC-2	PT-CU
7	Water level drop = 17.127 feet (p. 5, l. 9)	Water level drop = 0.243 feet or 2.9 inches (p. 130, l. 13)	Water level drop = 0 feet/0 inches (p. 5, l. 9)
62 (1 hour)	Water level drop = 17.732 feet (p. 5, l. 50)	Water level drop = 0.777 feet or 9.3 inches (p. 130, l. 24)	Water level drop = 0.013 feet or about 1/8 of one inch (p. 5, l. 50)
142	Water level drop = 18.05 feet (p. 6, l. 38)	Water level drop = 1.019 feet or 12.2 inches (p. 131, l. 7)	Water level drop = 0.017 feet or less than 1/4 of one inch (p. 6, l. 36)
1442	Water level drop = 18.89 feet (p. 19, l. 12)	Water level drop = 1.773 feet or 21.3 inches (p. 136, l. 32)	Water level drop = 0.017 feet or less than 1/4 of one inch (p. 19, l. 12)

These water level numbers at four points in the test (7, 62, 142 and 1442 minutes) show that the responses in PT-CD and RBLC-2 (both of which are downdip of the Northwest Fault) are closely related, but different in magnitude. The fourth column in the table shows that, in contrast to RBLC-2, the PT-CU well (located in Sand C updip of the Northwest Fault) shows no significant response. As the hydrologist who interpreted the pump tests conducted for the PAA-1 Application noted in his report regarding the PTW-1 Pump Test and the PTW-6 Pump Test:

The maximum change in water levels was approximately 0.05 feet (0.6 inches) with most values in the 0.02 feet (0.24 inch) range. This small amount of change is considered to be negligible and to have an insignificant effect on the interpretation of the test results. **The background water level changes are attributed to small changes in barometric pressure as discussed below.**⁶⁴

In summary, based on the prefiled evidence and testimony at hearing: (1) the preponderance of the evidence shows that the pump test recommended by the ALJ is not

⁶⁴ Exhibit UEC-Holmes 20, p. 4-9 (emphasis added).

required by the regulations at this stage in the permitting process;⁶⁵ (2) the preponderance of the evidence shows that UEC adequately characterized the geology and hydrology of the site to the degree required for a mine permit covering the proposed mine permit area; and (3) as explained below, the extra pump test recommended by the ALJ would provide no additional environmental benefit or protection.

D. The Extra Pump Test Recommended by the ALJ Would Provide No Additional Environmental Benefit or Protection.

The ALJ has recommended that the commission order UEC to conduct an additional pump test across the Northwest Fault to clear up the conflict between Dr. Bennett's testimony and Mr. Murry's testimony. However, as previously noted, to obtain a PAA for any of the production areas involving the Northwest Fault (PA-2, PA-3, or PA-4), UEC is already required to conduct another pump test, just as it did for the PAA-1 Application. These required pump tests will tell UEC and the commission everything they need to know about the transmissivity of the Northwest Fault as it relates to each particular production area. Moreover, the additional pump test recommended by the ALJ would not meet the regulatory criteria for a pump test for PA-2, PA-3 or PA-4. Rather, UEC respectfully suggests that it would simply be an extra pump test that will require additional time, money and effort not only on the part of the Applicant, but also on the part of the State, while providing no additional environmental protection.

In addition, there is no regulatory requirement that any faults within a mine permit area serve as barriers to the migration of mining fluid. Perhaps more importantly, however, the nature of the Northwest Fault—even if one assumes that the Protestants' argument regarding the raw data is correct—does not constitute a fatal flaw for the Mine Application. For example,

⁶⁵ ED Exhibit 10, Response 25, p. 20; Murry Cross-Examination, Transcript, p. 1334, ll. 7-17.

if the fault did allow water movement perpendicular to the fault plane (*i.e.*, from up dip to down dip), a single, standard monitor well configuration could potentially be used to straddle the fault. The efficacy of a standard ring, of course, would have to be verified with a pump test, which is a central element of a PAA application.⁶⁶ On the other hand, in the case of a laterally non-transmissive fault, monitor wells up dip and down dip of each other would not be in communication, and therefore, a single monitor well ring would not work.⁶⁷ When conducting a pump test for a PAA application, monitor wells would be completed for the test on both sides of the fault, and even if no communication occurred, TCEQ might, as an added measure of assurance, require UEC to keep the monitor wells in place and test them (water levels and control parameters) for some period of time under a full production stage.⁶⁸

The essential point is that well patterns and monitor well configurations can be put in place to allow mining regardless of whether the fault is sealing or transmissive. As Mr. Underdown explained, from an operator's standpoint, the downside to having a fault (transmissive or sealing) cut through an ore body is the potential effect it might have on mining economics: "From a cost standpoint, it can be more expensive if a fault is sealing because you may need two monitor well rings—one on either side of the fault—instead of just one that straddles the fault."⁶⁹ The impact of the Northwest Fault on the project as a whole will be definitively established later, as it should be under the Texas permitting process, in future PAA applications.

⁶⁶ See Exhibit UEC-Holmes 20 (PAA-1 Application).

⁶⁷ See Exhibit UEC-Holmes 40, p. 8 (providing instructions for a PAA application technical report).

⁶⁸ See *e.g.*, TEX. WATER CODE § 27.051(c) (stating "[I]n the permit, the commission ... shall impose terms and conditions reasonably necessary to protect fresh water from pollution.") and 30 TAC § 305.158; 30 TAC § 331.2(64)(B) (providing that "[s]econdary monitor wells are those wells in addition to designated monitor wells, used to delineate the horizontal and vertical extent of mining solutions.").

Nevertheless, in this particular situation there is strong evidence in the record that the Northwest Fault does in fact serve as a barrier to the flow of groundwater. Dr. Bennett testified that the water levels in wells above and below the Northwest Fault show a substantial decrease in static water level elevations along a Northwest to Southeast line across the Northwest Fault. All the sands show a dramatic drop in water level across the fault, with an extremely high gradient (change in water table elevation divided by distance).⁷⁰ “Since there are no underground ‘water falls’ in granular porous media, this very steep gradient located over the fault indicates a marked *decrease* in hydraulic conductivity (K).”⁷¹ He supported his conclusion in a graph showing the water levels and the “waterfall” effect,⁷² and with examples of citations to supporting peer-reviewed scientific literature, including an article authored by Dr. Galloway.⁷³ Significantly, this is data that is *independent* of the Northwest Fault pump tests, but which further supports Dr. Bennett’s interpretation of both the four-hour and the 24-hour tests.⁷⁴

In opining regarding the sufficiency of the evidence concerning the precise location of the Northwest Fault, the ALJ noted that “[the] assertion, that more information is needed to precisely locate the fault, is undoubtedly true. But, the question for this proceeding is whether the information is sufficient for the purposes of granting or denying an injection well permit.”⁷⁵ Similarly, the assertion that more information is needed to verify that the Northwest Fault is sealing in the areas of PAs 2, 3, and 4 is also undoubtedly true. But, again, the question for this proceeding is whether the information currently on hand is sufficient for the purposes of granting a mine permit. Given the applicable regulations and pump tests already required before any

⁶⁹ Issue G Rebuttal Testimony, Underdown, p. 9, ll. 1-3.

⁷⁰ Issue G Rebuttal Testimony, Bennett, p. 9, l. 23—p. 10, l. 8.

⁷¹ *Id.* at p. 10, ll. 7-8.

⁷² Exhibit UEC-Bennett 14 (demonstrating the substantial decrease in static water level elevations).

⁷³ Issue G Rebuttal Testimony, Bennett, p. 10, l. 18—p. 11, l. 3.

⁷⁴ *See* Bennett Direct Testimony, p. 37, ll. 7-19.

mining may occur in the vicinity of the Northwest Fault, the answer to that question is undoubtedly affirmative.

III.

THE ALJ'S RECOMMENDATIONS REGARDING CHANGES TO THE RESTORATION TABLE, BASELINE WATER QUALITY TABLE, AND COST ESTIMATES FOR FINANCIAL ASSURANCE IN THE DRAFT PAA

A. UEC Has No Objection to the Proposed Amendments to Restoration Table and Baseline Water Quality Table Values.

Since, as Mr. Holmes testified,⁷⁶ UEC's purpose in taking additional groundwater sample sets was to ultimately amend its PAA-1 restoration table to reflect the results of all the sample sets, UEC has no objection to the ALJ's recommendation that "the baseline water quality table and the restoration table and restoration table should be amended to reflect the average of all three rounds of baseline groundwater quality sampling for all constituents."⁷⁷ Under section 50.117(a) of title 30 of the Texas Administrative Code, the commission has the authority to order that Attachment 4A (the baseline water quality table) and Attachment 6 (the restoration table) be changed to reflect these averages; revised Attachments 4A and 6 are attached and are also reproduced in UEC's Proposed Findings of Fact and Conclusions of Law (dated October 22, 2010), which are also attached to these Exceptions.

B. The Recommended Changes to the Baseline Water Quality Table Lead to Changes to Control Parameter Values.

As the ALJ noted in the PFD, "TCEQ's PAA application form instructs applicants to provide a proposed control parameter table based on the groundwater analysis summary table with the control parameter upper limit being either 25% or 5 mg/l above the highest value for

⁷⁵ PFD, p. 53.

⁷⁶ Issue C Rebuttal Testimony, Holmes, p. 38, l. 17—p. 40, l. 23

⁷⁷ PFD, p. 128.

each control parameter.”⁷⁸ As shown on the revised Attachment 4A, the highest values for the control parameters—chloride and conductivity—are different than the values listed in the draft PAA-1 due to the incorporation of the additional two sample sets. Consequently, a revised Attachment 5 is attached and also reproduced in UEC’s Proposed Findings of Fact and Conclusions of Law (dated October 22, 2010), which are also attached to these Exceptions.

C. A Re-Calculation of the Cost Estimate for Aquifer Restoration Before Issuance of PAA-1 is Not Necessary from a Protective Standpoint.

The key statements in the PFD regarding the ALJ’s recommendations regarding Issue I and the cost estimate for aquifer restoration are as follows:

“But, the ALJ agrees with Goliad County’s assertion that that [*sic*], if it is determined that its challenge to the accuracy of baseline water quality has merit and a permit is issued, then UEC’s financial assurances should be recalculated to account for any increased restoration cost consistent with new restoration goals.”⁷⁹

And

“It appears to the ALJ that at the bottom line Protestants’ are concerned regarding the adequacy of UEC’s cost estimates and financial assurance because they believe it will likely cost more to restore groundwater if Protestants prevail on the baseline water quality issue. In other words, if UEC is required to restore groundwater to lower concentrations, then the cost will be more.”⁸⁰

As stated above, UEC has no objection to the commission implementing the ALJ’s recommendation regarding averaging the three groundwater quality sample sets to arrive at revised restoration table values or incorporating the two additional sample sets into the baseline quality table. UEC does respectfully disagree with the ALJ’s recommendation that financial surety for PAA-1 groundwater restoration be re-calculated at this time, *i.e.*, before PAA-1 is issued.

⁷⁸ PFD, p. 129.

⁷⁹ PFD, p. 68.

⁸⁰ PFD, p. 136.

If the rationale for the recommended re-calculation is to ensure the adequacy of the financial assurance amount that UEC is required to provide, then there is no need for recalculation to occur before PAA-1 is issued. In fact, there are at least four regulatory protections that will be applicable after PAA-1 is issued to ensure that adequate financial assurance is on hand for restoration, regardless of whether a recalculation occurs now. First, as Mr. Holmes testified,⁸¹ the estimate that is contained in the draft PAA-1 includes a built-in contingency of 20% over the estimated amount actually required to pay for six pore volumes of restoration activity; this contingency amount means that the current surety is actually enough to cover 10 pore volumes of restoration activity. In other words, because of the contingency requirement, funds to cover an over 50% increase in anticipated restoration activities is already included in the current surety amount.

Second, under Section 331.143(d),⁸² UEC will be required to review and update its written cost estimate for aquifer restoration, on or before December 31st of each year, to account for changes in costs *exclusive of* the inflation adjustment required under Section 37.131.⁸³ Third, since the aquifer restoration surety is included as part of the Radioactive Material License—UEC's application for which is currently still under technical review by TCEQ—an annual review of surety is also required by the Chapter 336 regulations. Specifically, Section 336.1125(f) dictates that “[t]he licensee’s financial assurance mechanism and the underlying cost estimates *will be reviewed annually by the agency* to assure that sufficient funds are available for completion of the decommissioning and reclamation plan if the work had to be performed by

⁸¹ Holmes Direct Testimony, p. 71, ll. 2-6.

⁸² See 30 TAC § 331.143(d).

⁸³ See 30 TAC § 37.131 (requiring operators to adjust the current cost estimate for inflation within 60 days prior to the anniversary date of the first establishment of the financial assurance mechanism).

an independent contractor.”⁸⁴

Finally, during the restoration process itself, the operator must submit semi-annual restoration progress reports until restoration is accomplished for the production area.⁸⁵ Each report must contain:

- (1) all analytical data generated during the previous six months;
- (2) graphs of analysis for each restoration parameter for each baseline well;
- (3) the volume of fluids injected and produced;
- (4) the volume of fluids disposed;
- (5) water level measurements for all baseline and monitor wells, and for any other wells being monitored;
- (6) a potentiometric map for the area of the production area authorization, based on the most recent water level measurements; and
- (7) a summary of the progress achieved towards aquifer restoration.⁸⁶

Consequently, TCEQ staff will have detailed and timely information regarding whether restoration is proceeding as anticipated, or whether additional resources—and additional surety—are required.

In summary, there is no environmental benefit or safeguard to be gained by re-visiting the current restoration surety estimate before issuance of PAA-1 by the commission. For this reason, UEC respectfully requests that the commission not make the re-calculation of financial surety a prerequisite to the issuance of PAA-1.

IV.

PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

At this time, the ALJ has not proposed any findings of fact and conclusions of law. Attached hereto as **Exhibit A** are UEC’s Proposed Findings of Fact and Conclusions of Law (dated October 22, 2010). UEC respectfully requests that the commission adopt and enter the same.

⁸⁴ 30 TAC § 336.1125(f) (emphasis added).

⁸⁵ See 30 TAC § 331.107(d) and Draft Mine Permit, Section V.G.3.c.

WHEREFORE, Uranium Energy Corp respectfully requests that the commission issue the Class III Injection Well Area Permit UR03075 and an Order granting the request for designation of an exempt aquifer, including the Findings of Fact and Conclusions of Law attached hereto. Uranium Energy Corp further requests that the commission issue Production Area Authorization UR03075PAA1 with a revised baseline water quality table as set forth in Attachment 4A hereto, a revised restoration table as set forth in Attachment 6 hereto, and a revised proposed control parameter table as set forth on Attachment 5 hereto. Uranium Energy Corp also requests that the commission enter the Findings of Fact and Conclusions of Law attached hereto as Exhibit A.

Respectfully submitted,

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⁸⁶ 30 TAC § 331.107(d)(1)-(d)(7); *see also* Holmes Direct Testimony, pp. 40-41.

CERTIFICATE OF SERVICE

I hereby certify that on this the 22nd day of October 2010, a true and correct copy of the foregoing Applicant Uranium Energy Corp's Exceptions to Proposal for Decision has been served via electronic mail and hand delivery/overnight mail on the following:

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TEXAS
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ATTACHMENT 4A
BASELINE WATER QUALITY TABLE
GOLIAD PROJECT SAND B PRODUCTION ZONE

PRODUCTION ZONE									WELL ID BY AREA*	
Parameter	Units	Mine Area**			Production Area			Production Zone		
		Low	Ave.	High	Low	Ave.	High	Mine	Prod.	
1	Calcium	mg/l	82	97	110	81	96	110	BMW-1	PTW-1
2	Magnesium	mg/l	14.5	17.5	20	10.9	17.8	20.3	BMW-2	PTW-2
3	Sodium	mg/l	93	105	120	82	97	117	BMW-3	PTW-3
4	Potassium	mg/l	2.92	3.79	5.13	2.5	6.4	16.5	BMW-4	PTW-4
5	Carbonate	mg/l	0	0	0	0	0	3	BMW-5	PTW-5
6	Bicarbonate	mg/l	294	319	350	251	308	368	BMW-6	PTW-6
7	Sulfate	mg/l	15	58	89	1	43.2	82	BMW-7	PTW-7
8	Chloride	mg/l	158	165	172	150	164	180	BMW-8	PTW-8
9	Fluoride	mg/l	0.51	0.58	0.65	0.50	0.58	0.80	BMW-9	PTW-9
10	Nitrate-N	mg/l	<0.01	0.01	0.01	0.01	0.14	1.73	BMW-10	PTW-10
11	Silica	mg/l	12.3	15.7	18.1	0.1	31.6	37.5	BMW-11	PTW-11
12	pH	std. units	7.28	7.58	8.18	7.18	7.48	7.96	BMW-12	PTW-12
13	TDS	mg/l	575	652	705	390	586	698	BMW-13	PTW-13
14	Conductivity	µmhos	1040	1104	1140	950	1084	1190	BMW-14	PTW-14
15	Alkalinity	mg/l	241	262	287	206	255	302	BMW-15	RBLB-1
16	Ammonia-N	mg/l	<0.1	0.1	0.2	0.05	<0.1	0.3	BMW-16	RBLB-3
17	Arsenic	mg/l	<2E-3	8E-3	0.069	0.002	0.011	0.030	BMW-17	RBLB-4
18	Cadmium	mg/l	<1E-3	1E-3	<1E-3	<0.001	<0.007	<1E-2	BMW-18	RBLB-5
19	Iron	mg/l	<3E-2	0.043	0.196	<0.03	0.068	0.320	BMW-19	
20	Lead	mg/l	<2E-3	2E-3	2E-3	<0.002	0.026	0.05	BMW-20	
21	Manganese	mg/l	0.007	0.017	0.050	<0.010	0.027	0.050	BMW-21	
22	Mercury	mg/l	4E-4	<4E-4	<4E-4	<0.0001	0.0002	<0.001	BMW-22	
23	Molybdenum	mg/l	<0.01	0.035	0.481	<0.01	0.185	0.500		
24	Selenium	mg/l	<3E-3	3E-3	6E-3	<0.003	0.007	0.010		
25	Uranium	mg/l	<1E-3	0.020	0.188	<0.003	0.050	0.804		
26	Radium-226	pCi/l	0.9	12.1	41	10.0	391.0	2000.0		

* List the identification numbers of wells used to obtain the high and low values for each parameter

**Monitor Wells

**ATTACHMENT 5
CONTROL PARAMETER UPPER LIMITS TABLE**

Production Zone	
Control Parameter	Sand B
Chloride, mg/l	225
Conductivity, μ mhos/cm	1488

Non-Production Zone	
Control Parameter	Sand A 1st Overlying Aquifer
Chloride, mg/l	730
Conductivity, μ mhos/cm	3,062

**ATTACHMENT 6
RESTORATION TABLE**

<u>Parameter</u>	<u>Unit</u>	<u>Concentration</u>
Calcium	mg/l	96
Magnesium	mg/l	17.8
Sodium	mg/l	97
Potassium	mg/l	6.4
Carbonate	mg/l	0
Bicarbonate	mg/l	308
Sulfate	mg/l	43
Chloride	mg/l	164
Nitrate-N	mg/l	0.14
Fluoride	mg/l	0.58
Silica	mg/l	31.6
TDS	mg/l	586
Conductivity	µmhos/cm	1084
Alkalinity	mg/l as CaCO ₃	255
pH	Std. Units	7.18 to 7.96
Arsenic	mg/l	0.011
Iron	mg/l	0.068
Manganese	mg/l	0.027
Molybdenum	mg/l	0.185
Selenium	mg/l	0.007
Uranium	mg/l	0.050
Radium ²²⁶	pCi/l	391.0

Exhibit A

APPLICATION OF	§	BEFORE THE STATE OFFICE
URANIUM ENERGY CORP	§	
FOR PERMIT NO. UR03075,	§	OF ADMINISTRATIVE
AND FOR AQUIFER EXEMPTION	§	
AND FOR PAA-1	§	HEARINGS
IN GOLIAD COUNTY, TEXAS	§	

**APPLICANT URANIUM ENERGY CORP'S
PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW**

FINDINGS OF FACT

I. Introduction

1. UEC has filed an application for a new Class III Underground Injection Control area permit, Permit No. UR03075, which includes a request for an aquifer exemption. The Class III application, including the request for an aquifer exemption, will be referred to collectively herein as the "Mine Application."
2. By its Mine Application, UEC seeks a Class III area permit (the "Mine Permit") and an Aquifer Exemption Order from the Texas Commission on Environmental Quality (the "Commission" or "TCEQ").
3. UEC has also filed an application for a new Production Area Authorization ("PAA") to authorize UEC to construct and operate Class III injection and production wells for the recovery of uranium in proposed Production Area 1 ("PA-1") within the Mine Permit Area. Such application will be referred to herein as the "PAA-1 Application."
4. In addition, UEC has filed an application for two Class I waste disposal wells, Permit Nos. WDW423 and WDW424, to be used for injection and disposal of byproduct waste fluids deep underground. Those applications, which will be referred to herein as the "Class I Applications" are not part of this docket.
5. UEC has also filed an application for a radioactive material license ("RML"), which is a license that authorizes the possession, receipt, processing, and temporary storage of natural uranium prior to transfer to authorized recipients and which also authorizes the temporary storage of byproduct material (waste) prior to transfer to authorized recipients and authorized byproduct material disposal facilities. The RML Application is not part of this docket.

**II. Location and General Description of the
Aquifer Exemption Area, Mine Permit Area, and Production Area**

1. The area within the boundary of the proposed Mine Permit is approximately 1,139.4 contiguous acres, including a 100-foot buffer zone (the "Mine Permit Area").

2. The Mine Permit Area is located within the Goliad Formation, which extends along the inner coastal plain from the Rio Grande River to near the Colorado River. The sand layers of the Goliad Formation comprise a part of the Evangeline aquifer. The Evangeline aquifer also includes geologic units both above and below the Goliad Formation. The Evangeline aquifer comprises a part of a larger aquifer system known as the Gulf Coast aquifer, which extends from Florida to Mexico.
3. The Goliad Formation in the Mine Permit Area is about 400-500 feet thick and consists of four distinct channel fill sands, which are labeled Sands A—D in the Mine Application.
4. The requested aquifer exemption would cover approximately 423.8 acres within the larger Mine Permit Area and would apply from a depth of 45 to 404 feet within the Goliad Formation (the “Aquifer Exemption Area”).
5. The requested PAA would be issued under the terms of the proposed Class III injection well area permit. The area within the boundary of proposed PA-1 is approximately 36.1 acres within a 94.2-acre mine area in the southern portion of the proposed Mine Permit Area.
6. The proposed uranium mining facility is located approximately 13 miles north of the city of Goliad, about 0.9 miles east of the intersection of State Highway 183 and Farm-to-Market Road 1961.
7. Current land use in the area immediately surrounding the proposed site is low density rural ranch or residential land. The communities of Weser and Ander are south of the proposed site. Both communities are small with a handful of homes, businesses and community facilities.

III. Procedural History

1. On August 9, 2007, UEC filed its Mine Application.
2. On August 29, 2007, following an initial review by TCEQ staff, TCEQ made an official determination that the Mine Application was administratively complete.
3. On September 5, 2007, TCEQ issued a Notice of Receipt of Application and Intent to Obtain a New Underground Injection Control Permit No. UR03075 (the “Public Notice Regarding the Mine Application”), which was mailed to landowners and mineral owners adjacent to the proposed permit area (the “Mine Permit Area”) and to interested persons and governmental agencies.
4. On September 19, 2007 and September 26, 2007, the Public Notice Regarding the Mine Application was published in *The Texan Express* and the *Victoria Advocate*.
5. On January 24, 2008, TCEQ’s Executive Director (the “ED”) held a public meeting in Goliad to receive public comment regarding the Mine Application.
6. Following a technical review of the Mine Application, during which the ED requested and received additional information from UEC, the ED made a preliminary determination that the Mine Application meets all applicable statutory and regulatory requirements for issuance of a mine permit and aquifer exemption order.

7. On May 21, 2008, TCEQ staff issued a Technical Summary and ED's Preliminary Decision.
8. On June 4, 2008, TCEQ staff issued a draft Mine Permit and a draft Aquifer Exemption Order.
9. Notices of the ED's Preliminary Decision were published in *The Texan Express* and the *Victoria Advocate* on June 20 and 25, 2008, and mailed to landowners and mineral owners adjacent to the Mine Permit Area and to interested persons and governmental agencies.
10. On September 4, 2008, UEC filed its PAA-1 Application.
11. On September 19, 2008, following an initial review by TCEQ staff, TCEQ made an official determination that the PAA-1 Application was administratively complete.
12. On September 19, 2008, TCEQ issued a Notice of Receipt of Application and Intent to Obtain a New Production Area Authorization (the "Public Notice Regarding the PAA-1 Application"), which was mailed to landowners and mineral owners adjacent to the Mine Permit Area and to interested persons and governmental agencies.
13. The Public Notice Regarding the PAA-1 Application was published in the *Victoria Advocate* on September 26, 2008, and in *The Texan Express* on October 1, 2008.
14. On October 31, 2008, the ED issued written responses to public comments regarding the Mine Application ("RTC Regarding Mine Application").
15. On February 25, 2009, TCEQ held a public meeting at which the Commissioners evaluated requests for a contested case hearing on the Mine Application.
16. On March 3, 2009, TCEQ issued an Interim Order by which it granted the requests for a contested case hearing filed by Goliad County (the "County"), Goliad County Groundwater Conservation District (the "District"), and others. TCEQ referred twenty-one disputed issues of fact, which had been raised in public comments, to the State Office of Administrative Hearings ("SOAH") for a hearing on the merits. TCEQ directed the ED to participate in the hearing and specified that a proposal for decision should be issued within one year from the first day of the preliminary hearing.
17. On May 14, 2009, the SOAH Administrative Law Judge (the "ALJ") held a preliminary hearing in Goliad during which he established jurisdiction over the Mine Application and heard testimony on the issue of party status.
18. On May 27, 2009, the ALJ issued SOAH Order No. 2 by which he designated the following as parties:

PARTY	REPRESENTATIVE
Uranium Energy Corporation (Applicant)	Monica Jacobs, Attorney
The Executive Director of the Texas Commission on Environmental Quality	Shana Horton, Staff Attorney
Office of Public Interest Counsel	Garrett Arthur, Attorney

Goliad County	James B. Blackburn, Attorney
Goliad County Groundwater Conservation District	Rob Baiamonte, Attorney
Goliad County Farm Bureau, individually and as representative of specified entities and landowners who are aligned parties ¹	P.T. Calhoun, President
Raymond V. Carter, Jr., aligned with Applicant	Aligned Property Owners
Tom E. Stockton, aligned with Applicant	Aligned Property Owners
Mona Samford and brother, Sidney Braquet, aligned with Applicant	Aligned Property Owners

19. By SOAH Order No. 2, the ALJ also established a procedural schedule, and set a hearing on the merits to be commenced on January 4, 2010. The procedural schedule was later extended based on agreed or unopposed motions filed by the parties and granted by the ALJ pursuant to 30 TAC § 80.4(c)(17).

20. Following a technical review of the PAA-1 Application, during which the ED requested and received additional information from UEC, the ED made a preliminary determination that the PAA-1 Application meets all applicable statutory and regulatory requirements for issuance of a production area authorization (“PAA”).

21. On June 2, 2009, TCEQ staff issued a Technical Summary and ED’s Preliminary Decision.

22. On June 9, 2009, TCEQ staff issued a draft PAA.

23. Notices of the ED’s Preliminary Decision were published in the *Victoria Advocate* on June 23, 2009, and in *The Texan Express* on June 24, 2009, and mailed to landowners and mineral owners adjacent to the Mine Permit Area and to interested persons and governmental agencies.

24. On August 14, 2009, UEC filed a request for the direct referral of the PAA-1 Application to SOAH for a contested case hearing pursuant to 30 TAC § 55.210.

25. On September 29, 2009, UEC filed an Agreed Motion to Consolidate for Purposes of Hearing its PAA-1 Application with its Mine Application (the “Motion to Consolidate”).

26. On October 5, 2009, the ED held a public meeting in Goliad to receive public comment regarding the PAA-1 Application.

¹ Those entities and landowners are: Ander-Weser Volunteer Fire Department, St. Peter’s Lutheran Church, Mary and Tom Anklam, Raymond and Karon Arnold, Aldon and Brenda Bade, Mickey and Elizabeth Beard, Richard and Catherine Bettge, Otto and Ruth Bluntzer, Matt and Erika Bochat, Gene and Reta Brown, John and Pearl Caldwell, Lynn and Ginger Cook, Luann and Craig Duderstadt, Darwyn and Waynell Duderstadt, Wilburn and Doris Duderstadt, Douglas and Wanda Franke, Mary Kathryn Bluntzer Gray, Joel and Jana Grieser, Brenda Jo Hardt, Ernest and Frances Hausman, Gaylon and Barbara Kornfuehrer, Ted and Pam Long, Mr. and Mrs. Jason Mikeska, Ricki McKinney, Susan and Weldon Orr, Margaret Rutherford, Wayne and Margie Smith, and Dorian and Carol Thurk.

27. On October 6, 2009, the ALJ held a preliminary hearing in Goliad, Texas, established jurisdiction over the PAA-1 Application, and designated parties.

28. On October 8, 2009, the ALJ issued SOAH Order No. 7, by which he granted the Motion to Consolidate.

29. On October 26, 2009, UEC filed an unopposed motion to abate this proceeding to allow it to make minor amendments to its Mine Application and PAA-1 Application. On October 26, 2009, the ALJ issued SOAH Order No. 8, by which he granted the abatement.

30. On November 6, 2009, UEC filed amendments to its Mine Application and its PAA-1 Application to reflect changes to its plans for the uranium processing facility. The amendments reflect that the final stages of uranium recovery would occur at an off-site location, rather than at the proposed Goliad facility. These amendments result in a smaller footprint of the Goliad processing facility.

31. By a Joint Status Report filed on December 15, 2009, the parties proposed a date of May 3, 2010, for the hearing on the merits and proposed a procedural schedule leading up to that hearing date.

32. On December 18, 2009, the ALH issued SOAH Order No. 9, by which he set the hearing on the merits for May 3, 2010, and established a procedural schedule as proposed by the parties. The parties also reached an agreement regarding the location of the hearing.

33. On January 20, 2010, the ALJ issued SOAH Order No. 10, which in accordance with the parties' agreement provided that if the hearing on the merits continued into a second week (*i.e.*, into the week of May 10th), that portion of the hearing would be held in Goliad.

34. On January 28, 2010, the ED issued written responses to public comments regarding the PAA-1 Application ("RTC Regarding PAA-1 Application").

IV. UEC's Exploration Activities

1. In January 2006, UEC applied for a uranium exploration permit from the Railroad Commission of Texas ("RCT"). The RCT approved the application and issued Uranium Exploration Permit No. 123 to UEC. Uranium Exploration Permit No. 123, as amended (the "Exploration Permit") authorized UEC to conduct uranium exploration activities within a 10,700-acre area in Goliad County, Texas (the "Exploration Permit Area").

2. In May 2006, UEC began exploratory drilling in the Exploration Permit Area.

3. In December 2006, the District had water quality testing conducted on various wells in the vicinity of the Exploration Permit Area. The tested wells included six wells located on private property upgradient from UEC's exploration activities (collectively, the "Homeowner Wells"), which wells are owned by various individuals who are protestants in this contested

case.² The tested wells also included three wells located downgradient from the exploration activities, including one of the wells located on property owned by Sidney Braquet.

4. On February 5, 2007, the County, by and through its attorney, wrote a letter to the RCT in which it alleged that UEC was not in compliance with the conditions of its Exploration Permit and that UEC's exploration activities were adversely impacting groundwater quality in the area. The County stated that the radium-226 levels in three tested wells, including the Braquet well, exceeded the applicable Maximum Contaminant Level ("MCL") set by the EPA and alleged that UEC's exploration activities had caused radioactive contamination of the groundwater.

5. In response to the County's allegations, the RCT undertook an investigation. Beginning March 7, 2007, the RCT conducted a three-day on-site inspection of the Exploration Permit Area during which it examined 117 borehole sites and conducted a gamma radiation survey of the area.

6. On March 13, 2007, the RCT issued Notice of Violation No. 080A (the "RCT NOV"). The RCT NOV is the only notice of violation that UEC has ever received. The RCT NOV covered only three subject matters. First, the RCT noted that each borehole was required to have a ten-foot concrete plug spanning three to thirteen feet below the surface. The RCT found that, in a few cases, UEC had installed the plug too far beneath the surface. In some cases, UEC had installed the plug too close to the surface. Second, the RCT noted that UEC was required to mark the location of each borehole. Although UEC had recorded the GPS coordinates of each borehole, the RCT inspectors were unable to locate them using GPS. Third, the RCT noted that UEC had not consistently followed required procedures regarding the re-topsoiling of drilling sites during reclamation, although the RCT noted that it had inspected "several sites . . . where the surface reclamation had been done in accordance with performance standards. . . ."

7. Upon issuance of the RCT NOV, UEC promptly undertook corrective action.

8. By letter dated April 20, 2007, the RCT informed the County that Tim Walter, a hydrologist employed by the RCT, had investigated the County's complaint and had determined that "no ground-water contamination ha[d] occurred as a result of [UEC's] drilling activities." The RCT explained and concluded as follows:

The mobility of uranium in aquifer environments such as that in northern Goliad County is extremely slow because: 1) ground-water movement itself is quite slow; and 2) the uranium must be oxidized from its normal, insoluble quadrivalent form to a soluble (and hence mobile) hexavalent form by oxygen-rich meteoric waters. Once movement begins, the oxidized uranium that is dissolved in the ground water can travel a short distance downgradient along the flowpath, where it is almost immediately re-precipitated due to the relatively more reduced environment along that flowpath. It is not plausible that the mobility of any uranium materials has been substantively affected by the drilling activities conducted by UEC. I conclude that the likely source of ground-water

² The homeowners/protestants whose wells were tested were Craig Duderstadt, Tom Anklam, Aldon Bade, Reta Brown, and Ted Long.

radioactivity generically identified in the analysis included in your complaint stems from natural sources in contact with the sampled wells themselves.

In summary, I have determined from the available evidence that no condition exists to warrant further enforcement action by the Commission with regard to ground-water issues. The Commission's investigation of your complaint has not revealed any practice or activity within the approved permit area that has adversely affected the wells identified in your complaint or the related aquifer, or is out of compliance with the Texas Uranium Mining Regulations (16 TEXAS ADMIN. CODE §11.1 et seq.); therefore, I consider investigation of the ground-water issues of your complaint to be closed.

9. On May 8, 2007, RCT issued a report setting forth the results of the gamma radiation survey that it had conducted in March. While the survey had revealed that radiation levels at a "small proportion" of the borehole sites were slightly higher than background level, the extent of elevated gamma radiation levels within the surveyed areas was "minimal" and was "not sufficient to pose a radiation exposure hazard." The RCT did not cite UEC for any violations as a result of the gamma radiation survey.

10. On June 12, 2007, at UEC's request, the RCT made a site visit to assess UEC's corrective actions. The RCT confirmed that the remedial action taken by UEC was satisfactory and set up a full inspection visit for June 18, 2007.

11. On June 18, 2007, the RCT conducted a full on-site inspection and verified that all remedial action required under the NOV had been completed. Accordingly, the RCT terminated the NOV.

12. UEC's Exploration Permit was revised to agree with both existing field practices and corrective action procedures utilized in responding to the RCT NOV. The revised Exploration Permit specified the following plugging procedure:

Exploration boreholes must be plugged with cement from total depth to at least 3 feet below ground surface and no closer than 1.5 feet from the surface. . . . The remainder of the hole between the top of the plug and the surface shall be filled with cuttings or non-toxic soil. To ensure that the proper plug depth is achieved, cemented boreholes will be allowed to settle and dry for several days and then re-checked for plug depth. If plug depth is not at the required distance from the surface, additional cement slurry will be added to bring the top of the plug to the required level

13. On July 9, 2007, the District, by and through its President, Mr. Arthur Dohmann, filed a complaint with the RCT in which it asserted that UEC's exploration activities had contaminated the Homeowner Wells. The District had conducted further testing on the Homeowner Wells in April 2007. The testing analysis did not show any contaminants or constituents in excess of MCLs in any of the Homeowner Wells, except for a high nitrate level³ in one of the wells on

³ MCL for nitrate is 10 mg/L. 40 C.F.R. § 141.54. The testing analysis showed that the Duderstadt well had a nitrate level of 12.5 mg/L.

Craig Duderstadt's property. Nevertheless, the District alleged that, between December 2006 and April 2007, the Homeowner Wells had "experienced degradation of quality concurrently with the exploration drilling." The District did not allege any uranium or radium contamination; rather, it pointed out that some of the Homeowner Wells had experienced increases in the level of some non-health-related constituents (*i.e.*, iron, sulfate, and chloride, all of which remained far below the applicable MCLs)⁴ and other non-regulated constituents (*i.e.*, calcium, magnesium and sodium). The District also alleged that there had been an increase in the nitrate level in the shallow Duderstadt Well. In fact, however, the December 2006 water analysis had not indicated the nitrate level in this well.

14. In response to the District's complaint, the RCT conducted a thorough investigation and assessment. By letter dated September 5, 2007, the RCT submitted a detailed report of its findings and conclusions to the District. The RCT concluded that none of the increases in constituent values relied upon by the District were significant. For example, with regard to the increases in calcium, sodium, sulfate, and chloride in some of the wells, the RCT explained that the levels of these constituents vary over time as the result of several factors, including seasonal changes and variations in rainfall amounts, and that the increases noted by the District were well within the expected ranges of natural variation for these constituents. The RCT also explained that there are several common causes of nitrate contamination in groundwater, including agricultural practices related to fertilizer use, leaking septic systems, and animal waste.

15. On the basis of its investigation and findings, the RCT concluded that the constituent increases in Homeowner Wells noted by the District were "not indicative of, nor likely to be the result of the uranium exploration activities conducted in the area." The RCT further stated as follows:

To date, the Commission's investigation of your complaint has not revealed any practice or activity at UEC's Uranium Exploration Permit No. 123 that is out of compliance with the Texas Uranium Mining Regulations or the Uranium Surface Mining and Reclamation Act. We consider this investigation to be closed.

16. On October 3, 2007, the RCT conducted another gamma radiation survey and found that all of the gamma radiation measurements taken were "within the estimated background (ambient) gamma radiation levels. ..."

17. In January of 2008, the District, by and through Mr. Dohmann, again wrote the RCT, stating that new water testing performed in October 2007 showed that some of the Homeowner Wells tested positive for iron bacteria. The District requested that the RCT conduct "an on-site study including long term monitoring" of what it called the "dirty well issue."

18. On February 29, 2008, the RCT responded to the District's second complaint against UEC. In declining its request for an on-site study, the RCT emphasized that UEC's exploration activities simply could not have impacted the Homeowner Wells:

⁴ See 40 C.F.R. § 143.3 (setting MCL for chloride at 250mg/l, MCL for iron at .3 mg/l and MCL for sulfate at 250 mg/l).

Your request is undoubtedly premised on the assumption that iron biofouling of the water wells is caused by the uranium exploration activities regulated by the Commission. Geoscientists in the Surface Mining and Reclamation Division do not believe there is any physical mechanism that would support the assumption that uranium exploration drilling could cause impacts to the hydrologic system creating specific changes in environmental conditions at the wells that would trigger iron biofouling.⁵

19. UEC's exploratory activities at the Exploration Permit Area continued through September 2008.

20. During the fifteen months between the termination of the RCT NOV and the conclusion of UEC's exploration activities, the RCT conducted thirteen additional on-site inspections to assess UEC's compliance with applicable plugging and reclamation requirements. Each time, UEC was found to be in full compliance with all plugging and surface reclamation requirements of the Exploration Permit and applicable regulations.

21. RCT issued its final Inspection Report on October 16, 2008. In that report, the RCT concluded that "all exploration boreholes, core holes, cased wells and rig supply wells" had been inspected for compliance with the Exploration Permit, and that no exploration drilling activity was ongoing.

V. General Findings Regarding In Situ Uranium Mining

The History of Uranium Mining in Texas

1. Uranium ore is a mineral deposit containing concentrated amounts of uranium that is suitable for mining. While uranium is naturally-occurring and ubiquitous, uranium ore is found in just a limited number of places. In the uranium mining industry within the United States, the most significant uranium ore reserves are located in sandstone formations in the Wyoming basins, on the Colorado Plateau, and in the South Texas Uranium Province.

2. The history of the uranium mining industry in Texas is described in the Sociological and Ecological Assessment conducted by Mr. John Kuhl, an ecologist and expert witness for UEC, and in the Executive Director's RTC Regarding the Mine Application. Such history is also summarized in part in UEC's public interest demonstration in the Mine Application and in a United States Geological Survey ("USGS") report authored by Susan Hall (the "Hall Report").

3. Uranium mining has been conducted in Texas since the late 1950s. Historically, Texas has produced 62 million pounds of yellowcake (U308).

4. In-situ uranium mining has been conducted in the United States, including Texas, since the mid-1970s. Texas has been the location of the greatest number of uranium in-situ recovery mines in the United States.

⁵ The RCT also attached a few articles which explained that iron biofouling is a common problem with private wells and that it is caused by the presence of certain bacteria.

The Mining Process

5. Uranium is subject to a chemical reaction known as redox (which is shorthand for reduction-oxidation). Redox entails a chemical process that with two primary chemical reactions: oxidation and reduction. Oxidation is an *increase* in the oxidation number of an atom, which generally occurs through the loss of electrons. Reduction is a *decrease* in the oxidation number of an atom, which generally occurs through the gaining of electrons. Substances that have the ability to oxidize other substances are known as oxidants. Oxidants include oxygen, iron oxide, sulfates, and nitrates. Substances that have the ability to reduce other substances are known as reductants. Reductants include naturally-formed iron sulfide minerals, pyrite, hydrogen sulfide, and hydrocarbon liquids and gases.

6. When in reduced form, uranium may react with oxidants (if they are present in sufficient quantities) and thereby become oxidized. When uranium is oxidized, it becomes soluble. Conversely, when in oxidized form, uranium may react with reductants and thereby become reduced. When uranium is reduced, it precipitates – in other words, it drops out of solution and into mineralized form.

7. The in situ uranium mining process involves: (1) the injection of a mining solution (or lixiviant) that is fortified with oxygen and sodium bicarbonate, into the uranium-bearing sand (the production zone) through injection wells, (2) the solubilizing of the uranium ore by the mining solution and the complexing of the solubilized uranium with the bicarbonate, which locks or traps the uranium in solution, and (3) the extraction of the uranium-bearing mining solution through production wells (or extraction wells).

8. The uranium-bearing mining solution is passed through pressurized vessels that contain ion-exchange resin beads. These beads are specifically designed to attract and lock up the uranium compound on the beads, thus removing it from the solution. After the uranium is removed from the uranium-bearing mining solution, the solution is then re-fortified with oxygen and bicarbonate to be re-injected into the production zone. A small amount of the stream (the “bleed”)—approximately 1% of the total—is diverted away from the production area for disposal in the Class I disposal well.

Environmental Controls

9. In situ uranium mining relies upon: (1) the existence of confining layers (or aquitards) above and below the production zone to control vertical excursions of the mining fluids, and (2) maintenance of a production bleed resulting in an area of lowered hydraulic head (cone of depression) to control horizontal excursions of the mining fluids. In other words, by injecting less than is extracted, the mine operator creates a negative sink within the production area causing native groundwater to flow toward the production area from all sides. To further prevent vertical migration of mining fluids, the mine operator also performs mechanical integrity testing on all of Class III production and injection wells as required by the TCEQ rules.

10. In addition, the mine operator monitors both water levels and water chemistry within production zone monitor wells, which form a monitor well ring around the production zone. The production zone monitor wells are pump tested to confirm that the monitor well ring is in communication with the production zone. The mine operator also monitors water chemistry

within non-production zone wells. In the event that an excursion is detected, the mine operator implements corrective action in accordance with the TCEQ rules.

11. The mine operator conducts additional environmental monitoring, including regular sampling of air, vegetation (including a grazing crop), soil, sediment, surface water and groundwater at pre-determined locations on a quarterly and annual basis, pursuant to the required RML.

12. Also pursuant to the RML, the mine operator disposes of any solid byproduct waste generated at the facility by placing it in approved containers, temporarily storing it in a designated byproduct storage area, and then transporting it to a licensed byproduct waste disposal facility.

13. The mine operator disposes of byproduct waste fluids generated during the in situ mining process and restoration process via one or more Class I disposal wells by which the fluids are injected deep underground into a non-USDW aquifer. These wells are built, tested and operated in accordance with standards set forth in the TCEQ rules and the Class I permit. Prior to operating the Class I disposal well(s), the mine operator performs mechanical integrity testing to ensure the safe condition of the well(s). During operation of the well(s), the mine operator continuously monitors well pressure and waste volume.

14. After mining, the mine operator restores the aquifer in accordance with TCEQ requirements. During the restoration period, groundwater quality is sampled extensively to track the progress of restoration across the former production area and to provide data for the required restoration progress report. Thus, the mine operator continues groundwater monitoring not only throughout its restoration operations, but also throughout the stability period following restoration operations. (The stability period is a minimum of one year and must be extended to two years if a restoration amendment is sought.) Moreover, even then, the mine operator does not simply discontinue groundwater monitoring, but rather seeks permission from TCEQ to cease monitoring.

15. Once the mine operation receives acknowledgment from the Executive Director that restoration is complete, the mine operator completes well plugging, abandonment and closure in accordance with a TCEQ-approved closure plan designed to prevent any movement of contaminants from the production zone that will cause pollution of a USDW.

16. TCEQ then conducts a final inspection of the site to certify that closure has been accomplished in accordance with the permit. The required financial assurance posted by the mine operation will not be released without the written approval of the Executive Director.

17. In situ uranium mining has been conducted in Texas under the Commission's EPA-approved regulatory scheme for over thirty years. During all of that time, no occurrences of off-site groundwater contamination have been documented.

VI. Mine Application – Issues Referred to SOAH

A. Whether the use and installation of the injection wells are in the public interest under Texas Water Code §27.051(a). Public interest in regard to this issue includes whether UEC's mining operation or restoration activities will adversely impact the public interest by unreasonably reducing the amount of groundwater available for permitting by the Goliad County Groundwater Conservation District.

1. The use and installation of the injection wells are in the public interest under Texas Water Code §27.051(a).

2. Authorization of the proposed uranium mining project will benefit the public by allowing the continued operation of an existing industry in Texas and by allowing the recovery of a domestic natural resource to meet energy demands in a manner that does not significantly add to greenhouse emissions.

a. The findings set forth in Section V above are incorporated by reference herein.

b. Information regarding the demand for uranium is contained in the Sociological and Ecological Assessment conducted by Mr. Kuhl, in UEC's public interest demonstration contained in the Mine Application, and in the Hall Report.

c. Energy demand in the United States is expected to grow by almost fifty percent by 2030.

d. According to the Department of Energy, the National Energy Policy recommends expanding the role of nuclear energy as a component of the United States' "energy picture."

e. Governments worldwide have turned their attention to solutions to control greenhouse gas emissions and produce affordable energy and, as a consequence, interest in nuclear energy has increased dramatically in recent years.

f. There are currently 435 operational nuclear reactors worldwide and that number is expected to grow significantly within the next decade. In the United States, which has 103 operational nuclear power plants providing approximately 20% of the country's energy, reactors that have met the end of their normal 40-year operating license are being granted extensions and the U.S. Department of Energy is actively providing incentives encouraging power corporations to apply for licenses to build new reactors in an attempt to stave off an imminent energy shortage.

g. Despite the fact that thirty-eight percent of U.S. uranium reserves are amenable to in situ mining, the United States still imports eighty-two percent of its uranium. The safe and effective use of ISR technology in mining uranium deposits is a potentially critical element in the movement towards energy independence in the United States.

3. In addition, authorization of the proposed uranium mining project will benefit the public by creating new jobs. The proposed project, if authorized to develop, will employ approximately 80 workers.

4. The proposed mining operations and restoration activities will not adversely impact the public interest by unreasonably reducing the amount of groundwater available for permitting by the Goliad County Groundwater Conservation District.

a. UEC's projected water consumption—water that will be disposed of down the Class I disposal wells—is between 133 acre-feet per year and 206 acre-feet per year, and it is a reasonable projection.

b. The Management Plan developed and adopted by the District projects that 800 acre-feet per year will be used for uranium mining and exploration, which is almost four times the amount projected to be used by UEC on an annual basis. Even so, the District's own Management Plan further projects that both the City of Goliad and the rural area of the county "will have adequate water supplies" to meet the projected demands.

c. UEC's mining operation and restoration will not unreasonably reduce the amount of groundwater available for permitting by the District.

5. UEC's compliance history does not require denial of the application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60. The findings set forth in Section IV above and Section VI.B below are incorporated by reference herein.

6. There are no practical, economic and feasible alternatives to the use of injection wells for uranium mining at the Mine Permit Area. The findings set forth in Section VI.U below are incorporated by reference herein.

7. The proposed Mine Permit protects the public health and welfare while allowing landowners to enjoy the benefits of their mineral estates.

a. Fresh water and air are adequately and sufficiently protected from pollution, soil and vegetation is adequately and sufficiently protected from contamination, and UEC's proposed activities will not negatively impact livestock and wildlife, including endangered species. The findings set forth in and/or incorporated into Sections VI.F, VI.H., VI.J., VI.L, VI.M and VI.R below are incorporated by reference herein.

b. Local roadways are sufficient to handle traffic to and from the proposed facility. The findings set forth in Section VI.K below are incorporated by reference herein.

B. Does the Applicant's compliance history require denial of the application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60?

1. UEC's compliance history does not require denial of the application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60.

2. The Executive Director prepared a compliance history summary in accordance with Texas Water Code § 27.051(e) and 30 TAC Chapter 60.

3. In the compliance history summary, UEC received a rating of 3.01, which is an average classification by default since UEC has no history of operations in Texas.

4. Mr. David Murry, who is the only witness to offer an opinion regarding the effect of the RCT NOV if it were considered, testified that he did not think the RCT NOV would affect UEC's compliance history classification even if considered.

5. Given UEC's prompt remedial action, the fact that RCT conducted many other inspections of UEC but issued no other notices of violation, and the fact that RCT concluded that UEC's exploration activities did not cause any groundwater contamination, even if the RCT NOV were considered as a part of UEC's compliance history, such compliance history would not require denial of the application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60.

a. The findings of fact set forth in Section IV above are incorporated by reference herein.

b. UEC's compliance history with RCT does not include violations constituting a recurring pattern of conduct that demonstrates a consistent disregard for the regulatory process, including a failure to make a timely and substantial attempt to correct the violations.

6. Considering the nature, duration, repetition, and potential impact of violations for all media, UEC's compliance history is not "unacceptable" for purposes of Section 331.120 of Title 30 of the Texas Administrative Code.

a. The findings set forth in Section IV above are incorporated by reference herein.

b. The RCT NOV did not include any alleged violations involving a failure to obtain a permit and any other violations that indicate UEC's tendency to engage in activities without seeking appropriate authorization from the Commission.

C. Does the application adequately and accurately describe baseline conditions of the groundwater in the proposed permitted area under applicable requirements of 30 TAC Chapter 331?

1. The application adequately and accurately describes baseline conditions of the groundwater in the proposed permitted area under applicable requirements of 30 TAC Chapter 331.

2. To establish local groundwater quality of the aquifer prior to the beginning of injection, UEC sampled: 1) all of the wells within the Mine Permit Area, including 20 regional baseline ("RBL") wells completed by UEC and six other wells; and 2) nearly all of the known wells within the area of review ("AOR"), which, for this purpose, include all land within the Mine Permit Area plus a circumscribing area of one kilometer.

3. Chapter 5 of the Mine Application contains water quality results for the 20 RBL wells and the 47 additional wells within the AOR.
4. The locations of the 20 RBL wells largely correspond to areas where UEC anticipates mining, *i.e.*, areas where there is ore. The RBL Wells use 20 foot screens (more precisely, 19.4 feet screens plus sand traps of 0.6 feet). Thus, pumping those wells yields a water sample that averages the water chemistry of at least that 20 foot interval.
5. In addition to the 20 RBL wells, UEC sampled a total of 47 wells for 28 water quality constituents. Six of these 47 wells were located inside the Mine Permit Area, and forty-one were located outside the Mine Permit Area.
6. Water quality data from the 20 RBL wells is similar to data from the 47 AOR wells for all constituents and parameters with the exception of uranium and radium-226, which are significantly higher in the RBL wells.
7. Radium-226 is a daughter product of uranium-238 (which is the most abundant uranium isotope, comprising 99.28% of all natural uranium). In other words, radium-226 is a product of the natural decay of uranium-238.
8. Overall, the water quality data from the RBL wells revealed levels of uranium and radium-226 well above the drinking water standards for those constituents. For example, the average radium-226 value for the RBL wells was 579 pCi/l, which is well in excess of the EPA drinking water standard of 5 pCi/l. Elevated levels of uranium and radium-226 are generally expected to be found in groundwater in and around areas of uranium mineralization.
9. Water quality data from the 47 AOR wells indicates that the larger area generally has good water quality. A few of the AOR wells, however, do exceed the EPA drinking water standard for radium-226, arsenic, manganese or iron, which is not unusual given the uranium mineralization in the area. For example, the radium-226 value from the Braquet well number 2 was 29.0 pCi/l. The gamma radiation log for that well shows that it is in a uranium ore zone. In addition, six of the 47 AOR wells have elevated nitrate levels, which is not unusual for rural settings.
10. Mr. David Murry, the Executive Director's witness, testified at the hearing that the purpose of establishing baseline water quality in a mine application is to get a general idea of the water quality in the area where the applicant plans to mine.
11. The location and screen lengths of the RBL wells were appropriate to characterize groundwater quality in the areas where UEC plans to mine.
12. The water samples obtained from the RBL wells are representative of groundwater quality in the areas where UEC plans to mine at the time of the sampling, which was prior to the beginning of injection operations.
13. In addition, the water samples obtained from the RBL wells and the AOR wells collectively are representative of local groundwater quality both in and around the Mine Permit Area at the time of the sampling, which was prior to the beginning of injection operations.

D. Does the application meet all applicable criteria of 30 TAC § 331.122, related to required consideration by the Commission prior to issuing a Class III Injection Well Area Permit?

1. The application meets all applicable criteria of 30 TAC § 331.122, related to required consideration by the Commission prior to issuing a Class III Injection Well Area Permit.
2. UEC submitted all of the data and each of the items for the applicable criteria listed in 30 TAC § 331.122, and the Commission considered each of those items.
3. UEC submitted all of the applicable data and items listed in 30 TAC § 331.122(2)(A), and the Commission considered each of those items. The Mine Application contains considerable information concerning both the baseline wells and the anticipated injection wells.
 - a. The Mine Application contains maps showing the proposed permit area, maps showing the area of review, a map showing the location of the baseline (registered) wells, an example diagram of a production area, and information regarding the anticipated number of injection wells within each of the anticipated production areas that are also shown on various maps.
 - b. Thus, UEC provided a map showing the pattern of wells and maps showing the areas of mineralization where it expects to drill injection wells.
4. UEC submitted all of the applicable data and items listed in 30 TAC § 331.122(2)(B), and the Commission considered each of those items.
 - a. Exploration drilling is discussed in both the Mine Application and the Executive Director's Response to Comments Regarding the Mine Application. Thus, the Commission was aware of and considered the exploratory boreholes that had been drilled in the Mine Permit Area.
 - b. The findings of fact set forth and/or incorporated by reference in Section VI.R below regarding exploratory boreholes are incorporated by reference herein.
5. UEC submitted all of the applicable data and items listed in 30 TAC § 331.122(2)(K), and the Commission considered each of those items.
 - a. Monitoring is discussed extensively in Section 9.7.3 of the Mine Application.
 - b. The Mine Application includes an explanation of UEC's plans for meeting the minimum monitoring requirements of the rules and included a generalized configuration of monitoring wells.

E. Has the Applicant demonstrated that the proposed exempted aquifer meets the applicable criteria of 30 TAC § 331.13?

1. The Applicant has demonstrated that the proposed exempted aquifer meets the applicable criteria of 30 TAC § 331.13.

2. The proposed aquifer exemption area does not currently serve as a source of drinking water for human consumption.
 - a. There are no drinking water wells within the proposed aquifer exemption area.
3. The proposed aquifer exemption area will not in the future serve as a source of drinking water for human consumption because it is mineral bearing with production capability.
4. The proposed aquifer exemption area also will not in the future serve as a source of drinking water for human consumption because it contains levels of uranium and radium-226 such that it would be economically or technologically impractical to render the water fit for human consumption. The findings set forth in Section VI.C. above and Section VII.C below are incorporated by reference herein.
5. The proposed aquifer exemption area was properly delineated.
 - a. UEC geologists identified the uranium ore bodies. Once the area of the initial production zones was fairly well delineated, an aquifer exemption boundary was then defined.
 - b. And as described in the Mine Application, “[t]he extent of the aquifer exemption is shown on all of the cross-sections (see Figures 6.8a through 6.13).... [T]he lateral extent of the aquifer exemption area would encompass all of the production areas shown on Figure 1.3 Project Map.” Each of these cross-sections was individually sealed by a professional geoscientist.
 - c. The Mine Application and related technical report were signed and sealed by Mr. Harry Anthony, who is a licensed professional engineer.
 - e. The portion of the aquifer within the proposed exempted area is mineral bearing with production capability.

F. Is the application sufficiently protective of groundwater quality?

1. The application is sufficiently protective of groundwater quality.
2. The draft Mine Permit contains sufficient provisions to ensure that the injection wells will be operated in a manner that protects groundwater from pollution.
3. The geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements. The findings stated under Section VI.H below are incorporated by reference herein.
4. Mining fluids will not migrate vertically or horizontally and contaminate an USDW (underground source of drinking water). The findings stated under Section VI.R below are incorporated by reference herein.

5. UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate. The findings stated under Section VI.L below are incorporated by reference herein.

G. Does the application adequately characterize and describe the geology and hydrology in the proposed permit area, including fault lines, under the applicable rules?

1. The application adequately characterizes and describes the geology and hydrology in the proposed permit area, including fault lines, under the applicable rules.

2. The Mine Application contains: a narrative description of the hydrology in the proposed Mine Permit Area; a narrative description of the geology in the proposed Mine Permit Area; permit-area cross sections (and a cross section index map); structure and isopach maps for each of the four sands (Sands A-D); and potentiometric surface maps—both within each sand and for the region—that show the direction of groundwater flow.

3. The Mine Application accurately and adequately describes all faults in the proposed permit area.

a. A down-to-the-coast fault or fault zone, referred to as the Northwest Fault, is present in the Mine Permit Area.

b. A smaller, up-to-the-coast fault, referred to as the Southeast Fault, is also present in the Mine Permit Area. The Southeast Fault is located well outside the proposed Aquifer Exemption Area and over 1,500 feet downgradient from the closest proposed production area, which is PA-1.

c. The Northwest Fault and the Southeast Fault are about 4,500 feet apart. Between these faults is a typical structure called a graben – a block of land that is displaced downward between two converging faults, thus forming a kind of valley between them. (The valley is a subsurface structure. It is not a visible feature at the surface.)

d. There are no other faults or fault zones present in the Mine Permit Area.

4. The Mine Application meets all applicable criteria of 30 TAC § 331.122, related to required consideration by the Commission prior to issuing a Class III Injection Well Area Permit. The findings set forth and/or incorporated by reference in Section VI.D above are incorporated by reference herein.

H. Do the geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements?

1. The geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements.

The Sands

2. The sands in the Mine Permit Area are tabular-shaped deposits. With the exception of Sand C, which thins out in the central part of the graben, the sands occur as continuous sheets, not in discrete channels. The fact that only one of the sands shows lateral pinch-out (that is, termination) within the Mine Permit Area indicates that the sand bodies are broader than the dimensions of the Mine Permit Area, which is about one mile by two miles. Thus, the sands must be much more than five to ten thousand feet wide.
3. Typically, the sands in the Mine Permit Area are each approximately thirty to fifty feet thick. In parts of the Mine Permit Area, sand body thicknesses approach one hundred feet. Here, two or more sands, each on the order of thirty to fifty feet thick, are superimposed to form a single sand body.
4. Sands B, C and D in the Mine Permit Area are confined aquifers. They are saturated with groundwater.
5. Sand A in the Mine Permit Area is hydraulically unconfined, but still isolated from the deeper sands by a low permeability confining layer throughout the Mine Permit Area.

The Confining Layers

6. Throughout the Mine Permit Area, each of the sands (Sands A—D) is separated from one another by continuous confining layers consisting of flood basin and related deposits comprised largely of low permeability clay.
7. These confining layers average between thirty and forty-five feet in thickness in the Mine Permit Area.
8. These confining layers are widespread sheets that extend across and beyond the Mine Permit Area. Thus, each of the sands is completely separated from the sand above and below by a confining layer of clay.

Hydraulic Gradient

9. For the most part, the hydraulic gradient within the Mine Permit Area is relatively flat, resulting in a slow rate of groundwater flow.

Average Flow Rate Throughout the Mine Permit Area as a Whole (Sands A—D)

- a. Chapter 6 of the Mine Application states that the groundwater flow rate across the entire Mine Permit Area and through each of the four sands (A-D) is approximately 6.7 feet per year.
- b. No expert witness offered an opinion regarding the estimated groundwater flow rate in the Mine Permit Area as a whole. However, Dr. William Galloway, a geology expert for UEC, testified that the hydraulic gradient within the Mine Permit Area is relatively flat, resulting in a slow rate of groundwater flow.

Average Flow Rate Across the Entire Mine Area of PA-1 (Sand B)

- c. Mr. Van Kelley, a hydrogeology expert for UEC, testified that a representative seepage velocity across the mine area of PA-1 is approximately 19 feet per year.
- d. No expert for the protestants offered any opinion regarding the estimated groundwater flow rate across the mine area of PA-1.

Flow Rate Across the 75-80 Feet Between the Eastern Edge of PA-1 and the Braquet Wells

- e. Mr. Thomas Neil Blandford, a hydrologist expert for the District, testified that water within the proposed Aquifer Exemption Area will reach the Braquet wells within “about 2 years.” The Braquet wells are located 75-80 feet outside of the Proposed Aquifer Exemption Area. If groundwater flowed 75-80 feet from the edge of the proposed Aquifer Exemption Area to the Braquet wells within two years, its velocity would be 37.5 to 40 feet per year.

10. Regionally, the direction of groundwater flow is typical of coastal plain aquifers, that is, coastward. Thus, groundwater flow in the Mine Permit Area is generally to the southeast.

Reducing Conditions

- 11. Significant amounts of pyrite are present in the Mine Permit Area. Because pyrite is present in this area, significant portions of the sands are reducing.
- 12. Even a very small amount of pyrite (*i.e.*, a fraction of one percent) can serve as an adequate reductant.

Containment of Mining Fluids

13. Mining fluids will not migrate vertically or horizontally and contaminate an USDW (underground source of drinking water). The findings set forth and/or incorporated by reference in Section VI.R below are incorporated by reference herein.

I. Does the Applicant meet the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331?

- 1. The Applicant meets the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331.
- 2. Chapter 13 of the Mine Application sets out a total preliminary estimated cost of \$633,470 for the plugging of the wells in the four planned production areas.
- 3. The Mine Application contains a commitment that UEC will follow the requirements of 30 TAC § 331.86 in plugging the wells.

4. The Mine Application also contains a description of the plugging method—cementing from bottom to top—that will be used to ensure that there will be no movement of fluid through the wells after abandonment, and a description of the restoration process that will ensure no movement of contaminants that will cause pollution from the production zone into a USDW will occur.

J. Is the application sufficiently protective of surface water quality?

1. The application sufficiently protective of surface water quality.
2. The draft Mine Permit contains sufficient provisions to ensure that the injection wells will be operated in a manner that protects surface water from pollution.
3. The draft Mine Permit prohibits the discharge of fluids to surface waters.
4. The Mine Application includes operational measures to comply with the Draft Mine Permit’s prohibition against the discharge of fluids to surface waters. These measures are part of UEC’s comprehensive surface water quality protection plan that includes the identification of sensitive surface water features (wetlands), effective management of flooding and runoff, spill prevention and control, and a multi-media monitoring program.

Wetlands

5. No impacts to wetlands are anticipated as a result of UEC’s proposed operations.
 - a. As part of UEC’s RML Application, UEC submitted a wetlands delineation and jurisdictional determination by its ecology expert, Mr. John Kuhl, who concluded that no impacts to wetlands are anticipated from the proposed mining operations.
 - b. The Corps of Engineers concurred with Mr. Kuhl’s determination.

Management of Flooding and Runoff

6. Chapter 9 of the Mine Application describes design features related to the management of flooding and runoff. These features will prevent and/or minimize contact of mining fluids with the ground surface.
 - a. The satellite plant will be located on a reinforced concrete process pad designed with raised curbs.
 - b. The process pad has been designed to account for a 25-year/24 hour rainfall event, when an estimated 9 inches of rain could fall on the process pad containment area.
 - c. During periods of rainfall, water will be directed via gravity flow to the sump systems. From the sumps, the captured fluids will be pumped to the waste storage tanks prior to being pumped to the Class I waste disposal wells.

7. After performing a study of the largest drainage way in the Mine Permit Area, UEC's drainage expert, Mr. Derek Naiser, concluded that with proper construction practices, mining activities will not impact the quality of runoff caused by flooding. Like the wetlands delineation, this study was submitted as part of UEC's RML Application.

Spill Prevention and Control

8. As is described in the RML Application, accidental spills at the plant, in the field, and at the Class I waste disposal well areas will be minimized by automated monitoring equipment, daily visual inspections and reporting, and by UEC's corrective action program. These operational measures and design features will minimize contact of mining fluids with the ground surface.

- a. The satellite plant and the waste storage tanks (where waste fluid is stored prior to being injected into the Class I wells) will be located on the reinforced concrete process pad designed with raised curbs to retain accidental spills. The fluid handling capacity of the satellite plant process pad is designed to accommodate 110 percent of the volume of fluid in the largest vessel that will rest on the pad. In the event of an accidental spill, any fluid on the pad will be contained and directed via gravity flow to the sump systems. From the sumps, the captured fluids will be pumped to the waste storage tanks prior to being pumped to the Class I waste disposal wells.
- b. The high pressure boosters in the waste disposal well areas will also be located on covered, reinforced concrete pads with raised curbs and a sump system. In the event of an accidental spill, any fluid on the pad will be contained and pumped back to the plant.
- c. The high pressure boosters, well head assemblies, and concrete pads will be visually inspected on a daily basis to detect any leaks or cracks.
- d. Pipelines from the fields to the plant and from the plant to the waste disposal well areas will likewise be visually inspected on a daily basis to detect any leaks.
- e. These pipelines and the high pressure boosters and well head assemblies have been designed to include various engineering safety devices designed to detect and minimize the effects of any leaks should they occur. These include fluid monitoring sensors to detect leaks, automatic shutdown valves to shut down fluid flow if a leak is detected, and pressure fall off switches designed to respond to a drop in pressure by closing valves to prevent the flow of fluid.
- f. The impact of any accidental spills that do occur will be minimized by UEC's corrective action program which provides that any spill be surveyed, sampled for uranium and radium, and cleaned up in accordance with applicable regulations.

9. UEC has adopted Operating, Safety and Emergency Procedures ("OSEP") that establishes safety protocols for transporting shipments, including shipments of loaded resin or solid byproduct waste. It also establishes emergency response protocols to be implemented in

the event of an accident. These protocols are designed to minimize potential impacts on the environment due to accidents.

- a. The loading of resin trailers and byproduct waste trucks will be conducted on the concrete process pad at the facility.
- b. In the event of a traffic accident, a UEC response team will be dispatched to the scene.
- c. Transport trucks will have on-board emergency instructions to allow public safety personnel to secure the area even before the arrival of the UEC response team.
- d. The UEC response team will recover any spill by loading it onto appropriate transport containers.
- e. Radiological surveys will be conducted and soil samples will be collected to verify that the site has been properly cleaned up.

Multi-Media Monitoring Program

10. Pursuant to the RML, UEC will be required to monitor surface water at pre-determined locations on a quarterly and annual basis throughout operations. This monitoring will enable UEC to detect any potential breach of the above-described controls.

K. Are local roadways sufficient to handle traffic to and from the proposed facility?

1. Local roadways are sufficient to handle traffic to and from the proposed facility.
2. UEC's site access plan provides that UEC will construct a new road so that the main entrance to the proposed site will be directly onto Highway 183.
3. The site entrance would be a right angle (T-intersection) onto State Highway 183 approximately 0.7 miles North of the intersection of State Highway 183 and FM 1961 and 0.4 miles South of the intersection of SH 183 and Duderstadt Road.
4. Highway 183 is designed for higher volume traffic and larger vehicles than local county roadways.
5. Highway 183 is designed to higher standards which incorporate greater sight distances and safety into its horizontal and vertical alignment than FM 1961, which is the alternative road for access to the proposed site. Highway 183 also has wider traffic lanes and shoulders than FM 1961. These factors provide the safest ingress and egress point off Highway 183.
6. The average daily traffic based on the projected vehicle traffic for the construction phase, assuming conservatively that the construction activities of plant site, mine area and waste disposal wells occur at the same time, will be approximately 42 vehicles per day. The average daily traffic based on the projected vehicle traffic for operations of the facility will be approximately 66 vehicles per day.

7. These traffic volumes would allow for a standard Texas Department of Transportation entrance permit with no special requirements, other than a 75-90 degree entrance angle, adequate sight distance, adequate drainage structure with 6:1 end treatment for highway drainage, and other requirements of TxDOT's Access Management Manual, all of which UEC intends to provide.

L. Whether UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate.

1. UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate.

2. Chapter 12 of the Mine Application contains a description of UEC's proposed restoration procedures, plans for a restoration demonstration and report to TCEQ regarding the demonstration.

3. UEC's restoration proposal incorporates improvements as compared to past restoration efforts in Texas. These include: 1) the use of reverse osmosis on a commercial scale *during mining* to provide a jump start on restoration; 2) the initiation of restoration as soon as mining ends in a production area; and 3) the continued use of the ion exchange (IX) columns to remove residual uranium *during restoration* instead of only during mining.

4. In addition, UEC's restoration efforts will benefit from technological advancements. The membranes that are used in the reverse osmosis process are now specifically designed to function with a longer life span and higher performance in the particular water quality which they will be used.

5. Even though no restoration model is required, UEC does have a state-of-the-art hydrogeological model that it can use to increase its restoration success in its first production area.

6. Within 18 months after initiation of mining in the first production area (PA-1), UEC will conduct a restoration demonstration.

M. Will the Applicant's proposed activities negatively impact livestock and wildlife, including endangered species?

1. The Applicant's proposed activities will not negatively impact livestock and wildlife, including endangered species.

2. The Mine Application is sufficiently protective of surface water quality. The findings of fact set forth and/or incorporated by reference in Section VI.J above are incorporated by reference herein.

3. Air is adequately and sufficiently protected from pollution. The proposed uranium mining project will not be a significant source for the release of airborne contaminants.

- a. When UEC was still planning to construct and operate a full processing facility rather than the currently-proposed satellite facility, it obtained an air quality Permit-by-Rule under 30 TAC § 106.416 for the Goliad Project facility.
 - b. Even the originally-planned full processing plant would have had near zero particulate emissions. The currently proposed satellite plant, which does not have a yellowcake dryer, will likewise have near zero particulate emissions.
 - c. UEC performed a radiological assessment to evaluate the radiological effects of the Goliad Project as part of its RML Application development (“Radiological Assessment”).
 - d. As part of the Radiological Assessment, potential airborne releases of radon were quantitatively assessed. The computer code MILDOS-Area (“MILDOS”) was used to calculate dose from radon and its daughter products and the dose commitments to individuals based on specific source strength, release rates and time inputs. The MILDOS modeling accounts for all known potential airborne releases of radon and its daughter products, including radon released as a result of the proposed mining and restoration activities.
 - e. The results of the MILDOS modeling provide an estimated annual effective dose commitment of radon and its daughter products at specified individual receptor locations, and an estimated annual effective dose commitment at the license area boundary (which is the same as the Mine Permit Area boundary). A dose limit is the threshold level of radon that has been deemed to be protective for humans. There is a margin of safety—or level of conservatism—built into the limit.
 - f. The highest annual dose commitments at both the individual receptor locations and the license area boundary are for the year 2014. Even those highest dose commitments are: 1) significantly less than the dose limit allowed to individual members of the public (which is 100 mrem/year); and 2) far below the level at which livestock could be adversely impacted.
 - g. Loaded resin that will be transported from the satellite plant has a high moisture content, and the uranium will be tightly bonded to the resin. As a result, in the event of a traffic accident involving a shipment of loaded resin, air particulate would be negligible.
 - h. The findings of fact set forth and/or incorporated by reference in Section VI.J.9 above (regarding the OSEP) are incorporated by reference herein.
4. Soil and vegetation are adequately and sufficiently protected from contamination. The proposed uranium mining project will not be a significant source for the release of contaminants into soil and sediment.
- a. The findings of fact set forth and/or incorporated by reference in paragraphs 6-9 of Section VI.J. above (regarding the management of flooding and runoff and spill prevention and control) are incorporated by reference herein.

- b. The concrete process pad will be underlain with a geomembrane to provide extra assurance that subsurface soils will not be contaminated.
 - c. The satellite plant and the production area(s) will be fenced and gated.
5. Groundwater is adequately protected from pollution. The findings set forth in and/or incorporated by reference into Sections VI.F, VI.H., and VI.L above and Section VI. R below are incorporated by reference herein.
6. UEC has adopted an Operational Monitoring Program, which is set forth in the RML Application. Pursuant to the RML, UEC will be required to conduct regular sampling of air, vegetation (including a grazing crop), soil, sediment, surface water and groundwater at pre-determined locations on a quarterly and annual basis throughout its operations. This monitoring will enable UEC to detect any potential breach of the above-described controls.
7. Wildlife, including endangered species, will not be negatively impacted by changes in vegetation or removal of habitat as a result of UEC's proposed activities.
- a. A total of approximately 160 acres of vegetation would be removed for construction of the satellite plant, disposal well, and roads, as well as at the drilling sites (assuming that PAAs are sought and granted for each of the four proposed production areas).
 - b. Vegetation found in the proposed Mine Permit Area is common in the general area and appears to be similar to the vegetation found on surrounding properties in the vicinity of the Mine Permit Area. Thus, the project will not have negative impacts to wildlife on a regional scale.
 - c. Local impacts will be limited to temporary re-location of some wildlife in the immediate area. Again, because vegetation in the surrounding vicinity is similar to the vegetation of the proposed Mine Permit Area, it is possible that wildlife species inhabiting the proposed Mine Permit Area could relocate to the surrounding area, if necessitated by construction activities.
 - d. Although four state-listed reptile species are listed for Goliad County, none of these species were observed during the site evaluations in Spring and Fall 2007.

N. Will the Applicant's proposed activities negatively impact the use of property?

- 1. The Applicant's proposed activities will not negatively impact the use of property.
- 2. Existing land uses adjacent to the Mine Permit Area include low density, scattered rural residential, cattle ranching, cropland, and oil and gas production.
- 3. UEC has demonstrated its compliance with the TCEQ regulatory scheme governing in situ uranium mining. Fresh water and air are adequately and sufficiently protected from pollution, soil and vegetation is adequately and sufficiently protected from contamination, and UEC's proposed activities will not negatively impact livestock and wildlife, including

endangered species. The findings set forth in Sections VI.F, VI.H., VI.J., VI.L, VI.M above and in Section VI.R below are incorporated by reference herein.

4. The proposed mining operations and restoration activities will not adversely impact the public interest by unreasonably reducing the amount of groundwater available for permitting by the Goliad County Groundwater Conservation District. The findings set forth in Section VI.A.4 above are incorporated by reference herein.

O. Will the Applicant's proposed activities adversely affect public health and welfare?

1. The Applicant's proposed activities will not adversely affect public health and welfare.

2. Fresh water and air are adequately and sufficiently protected from pollution; soil and vegetation are adequately and sufficiently protected from contamination; and UEC's proposed activities will not negatively impact livestock and wildlife, including endangered species. The findings set forth in Sections VI.F, VI.H., VI.J., VI.L, VI.M above and in Section VI.R below are incorporated by reference herein.

3. Local roadways are sufficient to handle traffic to and from the proposed facility. The findings set forth in Section VI.K above are incorporated by reference herein.

4. The proposed mining operations and restoration activities will not adversely impact the public interest by unreasonably reducing the amount of groundwater available for permitting by the Goliad County Groundwater Conservation District. The findings set forth in Section VI.A.4 above are incorporated by reference herein.

P. Whether the proposed mining is in the recharge zone of the Gulf Coast Aquifer (Evangeline component).

1. The proposed mining is not in the recharge zone of the Gulf Coast Aquifer (Evangeline component).

2. An outcrop is an exposure of a sedimentary deposit or rock layer at the surface of the Earth. In most places in the Texas coastal plain, a layer of soil and vegetation (which is called the weathered zone) covers the underlying unweathered sedimentary deposits or rock layers, such that they are not directly visible at the surface.

3. Recharge zones occur where an aquifer unit outcrops. A recharge zone is the area of the outcrop where the majority of recharge occurs.

4. The top of Sand A, which is the shallowest of the sands in the Mine Permit Area, merges into the weathered zone and then crops out along the northwest margin of the Mine Permit Area. The outcrop area is on the up-thrown side of the Northwest Fault – in other words, outside of the graben.

5. Significant recharge is possible in this area. However, no mining will occur in Sand A outside the graben. In other words, no mining will occur where Sand A outcrops.

6. In the graben between the faults, a surface confining layer of clay and caliche overlies Sand A, so that Sand A does not receive significant recharge from surface precipitation in this area. This overlying layer of clay and caliche is one hundred feet thick in places and has low permeability.

7. Both inside and outside the graben, Sand A is isolated from Sand B by a continuous confining unit that underlies Sand A.

8. In contrast to Sand A, Sands B, C and D do not outcrop within the proposed Mine Permit Area and do not receive surface recharge within the proposed Mine Permit Area.

Q. Whether the Gulf Coast Aquifer is a confined aquifer in the areas of Goliad County where UEC will conduct UIC activities.

1. Sands B, C and D in the Mine Permit Area are confined aquifers.

2. Sand A in the Mine Permit Area is hydraulically unconfined, but still isolated from the deeper sands by a low permeability layer in most of the Mine Permit Area and thus confined in a geologic sense.

3. Each of the sands (Sands A—D) in the Mine Permit Area are separated from one another by confining layers consisting of flood basin and related deposits comprised largely of low permeability clay. These confining layers are continuous throughout the Mine Permit Area.

R. Whether mining fluids will migrate vertically or horizontally and contaminate an USDW (underground source of drinking water).

1. Mining fluids will not migrate vertically or horizontally and contaminate an USDW (underground source of drinking water).

2. The geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements. The findings of fact set forth in and/or incorporated into Section VI.H above are incorporated by reference herein.

Horizontal Containment

3. Maintaining a cone of depression during mining operations prevents the horizontal migration of mining fluids.

4. PA-1 is not involved with the Northwest Fault. Prior to commencing mining operations near the Northwest Fault, UEC will have to apply for, and the Commission will have to issue a production area authorization for at least one of the other proposed production areas. To obtain such a production area authorization, UEC will have to design and conduct a hydrologic testing program for the production area in which it seeks authorization to mine and submit the results of such hydrologic testing as a part of its PAA application.

5. The Northwest Fault creates an effective barrier to the lateral flow of groundwater within the sands.

- a. The water levels in wells above and below the Northwest Fault show a substantial decrease in static water level elevations along a Northwest to Southeast line across the Northwest Fault. All the sands show a dramatic drop in water level across the fault, with an extremely high gradient (change in water table elevation divided by distance).
 - b. This very steep gradient located over the fault indicates a marked decrease in hydraulic conductivity.
6. The Southeast Fault is located well outside the proposed Aquifer Exemption Area and over 1,500 feet downgradient from the closest proposed production area, which is PA-1.

Vertical Containment

Clay Confining Layers

7. The findings of fact set forth and/or incorporated by reference in Section VI.Q above (regarding confinement) are incorporated by reference herein.

Faults

8. PA-1 is not involved with the Northwest Fault. Prior to commencing mining operations near the Northwest Fault, UEC will have to apply for, and the Commission will have to issue a production area authorization for at least one of the other proposed production areas. To obtain such a production area authorization, UEC will have to design and conduct a hydrologic testing program for the production area in which it seeks authorization to mine and submit the results of such hydrologic testing as a part of its PAA application.
9. The Northwest Fault does not serve as a hydraulic connection between the sands – *i.e.*, it is not vertically transmissive.
10. The Southeast Fault is located well outside the proposed Aquifer Exemption Area and over 1,500 feet downgradient from the closest proposed production area, which is PA-1.

Boreholes

11. Boreholes will not serve as a conduit for vertical migration.
12. All exploration boreholes drilled by UEC were plugged with cement from total depth to at least 3 feet below ground surface and no closer than 1.5 feet from the surface. The remainder of the hole between the top of the plug and the surface were filled with cuttings or non-toxic soil. The findings of fact set forth in Section IV above are incorporated by reference herein.
13. In the early 1980s, Moore Energy Corporation (“Moore Energy”) drilled about 487 boreholes throughout its entire exploratory permit area, which covered 17,635 square acres of land surface (some of which overlaps with UEC’s exploratory permit area, but much of which does not).

14. Only three of the boreholes drilled by Moore Energy were logged before May 7, 1982 (the effective date of the RCT's *current* plugging regulation). All of the other boreholes were logged after March 15, 1983, and were likely drilled shortly before that. Thus, assuming compliance with the RCT's plugging regulation, these boreholes were plugged in a manner that prevented the mixing of water from different sand units within the hole.

15. Even if not plugged in accordance with the RCT's current plugging regulation, the Moore Energy boreholes would not serve as conduits for vertical migration.

- a. At a minimum, the drilling mud would have been left in the boreholes.
- b. Uncased boreholes will typically collapse, and the thick sequence of clays will move across the borehole, further sealing and preventing migration. Even a few centimeters of clay will substantially retard fluid movement.
- c. Even in the absence of clay from a collapsed borehole wall, drilling mud in a borehole, in and of itself, constitutes a significant barrier to groundwater flow, particularly after it has been allowed to gel for a time.

Restoration and Post-Restoration

16. UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate. The findings of fact set forth and/or incorporated by reference in Section VI.L above are incorporated by reference herein.

17. The movement of groundwater from a restored aquifer into a USDW does not mean that the USDW will be contaminated, *even if* a restoration amendment were granted.

- a. Most constituents, including uranium and radium, are subjects to geochemical processes and reactions that retard their movement relative to the movement of groundwater.
- b. Uranium is immobilized when it encounters sufficiently reducing conditions.
- c. The movement of radium-226 will likewise be retarded by precipitation and adsorption onto clays and iron oxides.
- d. In addition, as a contaminant moves downgradient by advection, it tends to spread out, occupying an increasingly larger volume of aquifer. The inevitable result is that the concentration of a dissolved contaminant must decrease downgradient.
- e. Many restoration amendments have been granted by the Commission, and yet no occurrences of off-site groundwater contamination have been documented throughout the thirty year history of in situ uranium mining in Texas.

S. Whether there are any USDWs within the injection zones proposed by UEC.

1. There are USDWs within the injection zones proposed by UEC.

2. Each of the four proposed production zones is a USDW.

T. Whether any USDWs within Goliad County will be adversely impacted by UEC's proposed in situ uranium operations.

1. No USDWs within Goliad County will be adversely impacted by UEC's proposed in situ uranium operations.
2. The geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements. The findings set forth in Section VI.H above are incorporated by reference herein.
3. Mining fluids will not migrate vertically or horizontally and contaminate an USDW (underground source of drinking water). The findings set forth in Section VI.R above are incorporated by reference herein.
4. UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate. The findings set forth in Section VI.L above are incorporated by reference herein.

U. Whether there is a "practical, economic and feasible alternative to an injection well reasonably available" within the meaning of that term as set forth in TWC § 27.051(d)(2).

1. There are no practical, economic and feasible alternatives to the use of injection wells for uranium mining at the Mine Permit Area.
2. The available alternative methods for recovering uranium are underground and open pit (surface) mining, both of which involve de-watering the production zone sands, removing huge quantities of surface and subsurface material (*i.e.*, the overburden), and creating substantial amounts of solid waste (*i.e.*, tailings).
3. The in situ mining process is a more environmentally-protective means of uranium mining. As compared to the available alternatives, in situ uranium mining greatly minimizes physical damage to the land and subsurface and results in much less solid waste.
 - a. In situ uranium mining does not require the de-watering of the aquifer or the removal of overburden.
 - b. In situ uranium mining does not result in the creation of substantial amounts of tailings.

VII. PAA-1 Application

A. Mine Plan

1. UEC submitted an updated mine plan as part of its PAA-1 Application. The draft PAA, UR03075PAA1 (PAA1), includes the updated mine plan.
2. The updated mine plan included a map of the proposed production areas and an updated estimated schedule for production and restoration.
3. According to UEC's mine plan, UEC will begin restoration operations in PA-1 promptly after mining.

B. Restoration Table

1. UEC's proposed restoration table for PA-1 is contained in Chapter 6 of the PAA-1 Application and in the draft PAA, UR03075PAA1 (PAA1).

Parameters

2. UEC's proposed restoration table includes all parameters in the suite established in accordance with the requirements of §331.104(b).
 - a. UEC requested that ammonia, cadmium, lead and mercury be excluded from the restoration table.
 - b. Ammonia, cadmium, lead and mercury are not suitable restoration parameters because (1) they do not occur in the production zone; (2) these elements are not included in the proposed injection solution; (3) they are not subject to being dissolved by mining solutions (because they are not in the production zone), and (4) extensive water quality sampling indicates that these elements are not in the aquifer in general.

Values

3. TCEQ's application form instructs applicants to base the restoration table on the required groundwater analysis report summary. The format of the groundwater analysis report summary is dictated by Figure 3, which is attached to the application form.
4. The values in UEC's restoration table included in its PAA-1 Application consist of the column headed production area average for parameters shown on the production area baseline water quality form for the production zone.
5. The values in UEC's restoration table included in its PAA-1 Application were derived from groundwater samples collected at the eighteen baseline wells for PA-1, consisting of PTW-1 through PTW-14 and RBL Wells 1, 3, 4 and 5.

6. When UEC sampled PTWs 7-14, the PAA-1 Application was still in the technical review phase.

7. The restoration values in UEC's restoration table included in its PAA-1 Application are the mean concentration or value for each parameter based on all measurements from groundwater samples collected from baseline wells at the time that the draft PAA was issued. After issuance of the draft PAA, UEC took and analyzed additional groundwater samples (referred to as rounds 2 and 3) from its baseline wells in PA-1.

8. The restoration values in the restoration table attached hereto as Attachment 6 are the mean concentration or value for each parameter based on all measurements from groundwater samples collected from baseline wells, including those collected at the time that the draft PAA was issued and those collected in rounds 2 and 3.

C. Baseline Table

1. UEC's baseline groundwater summary table for PA-1 is contained in Chapter 6 of its PAA-1 Application and in Attachments 4A and 4B of the draft PAA, UR03075PAA1 (PAA1).

2. The findings of fact set forth in and/or incorporated into Section VI.C. are incorporated by reference herein.

The Groundwater Quality Data from Which the Baseline Table in the PAA-1 Application Was Derived (First Round)

3. The baseline groundwater summary table in the contains values derived from (a) 22 mine area monitor wells completed in the production zone (BMW-1 through BMW-22); (b) 18 baseline wells completed in the production zone within the production area (PTW-1 through PTW-14; RBLB-1; RBLB-3 through RBLB-5); and (c) nine mine area monitor wells completed in the nonproduction zone (OMW-1 through OMW-9).

4. The baseline groundwater summary table contains: a) the averages and ranges of the parameter values determined for the designated production zone monitor wells (BMW-1 through BMW-22), which are monitor wells completed in the production zone; (b) the averages and ranges of the parameter values determined from eighteen designated production zone wells in the production area (PTW-1 through PTW-14; RBLB-1; RBLB-3 through RBLB-5), which are baseline wells completed in the production zone within the production area; and (c) the averages and ranges by zone of the parameter values determined for designated nonproduction zone monitor wells (OMW-1 through OMW-9), which are monitor wells completed in nonproduction zones.

The Values in the Baseline Table in the PAA-1 Application

Production Zone Monitor Wells (BMW-1 through BMW-22)

5. The water samples obtained from the designated production zone monitor wells (BMW-1 through BMW-22) and used to derive the data included in baseline groundwater summary table are representative of groundwater quality in the area of the monitor well ring surrounding PA-1.

- a. The location and screen lengths of these monitor wells were appropriate and complied with all applicable regulatory requirements. The findings of fact set forth in Section VII.E below are incorporated by reference herein.
 - b. The well development and sampling methodologies employed by UEC were appropriate and in accordance with accepted protocols.
6. This data establishes an average value for radium-226 of 12.1 pCi/l, which exceeds the EPA drinking water standard for radium-226 (5 pCi/l).

Nonproduction Zone Monitor Wells (OMW-1 through OMW-9)

7. The water samples obtained from the designated nonproduction zone monitor wells (OMW-1 through OMW-9) and used to derive the data included in the baseline groundwater summary table are representative of groundwater quality in Sand A overlying the PA-1 production area.

- a. The location and screen lengths of these monitor wells were appropriate and complied with all applicable regulatory requirements. The findings of fact set forth in Section VII.E below are incorporated by reference herein.
 - b. The well development and sampling methodologies employed by UEC were appropriate and in accordance with accepted protocols.
8. This data establishes an average value for arsenic of .018 mg/l, which exceeds the EPA drinking water standard for that constituent (.10 mg/l). With the exception of one well, all of the OMWs have arsenic values in excess of the .10 mg/l standard.

Production Zone Baseline Wells (PTW-1 through PTW-14; RBLB-1; RBLB-3 through RBLB-5)

9. The water samples obtained from the eighteen baseline wells (PTW-1 through PTW-14; RBLB-1; RBLB-3 through RBLB-5) and used to derive the data included in the baseline groundwater summary table are representative of groundwater quality in the areas where UEC plans to mine.

- a. The location and screen lengths of these baseline wells were appropriate and complied with all applicable regulatory requirements.
- b. As the Commission explained in rule-making comments related to the recent revisions to Chapter 331, one sample set is adequate for establishing baseline.
- c. Because the area within the boundary of proposed PA-1 is approximately 36 acres, one baseline well for every four acres would be approximately 9 wells. Thus, UEC installed and sampled about twice the number of baseline wells required by the current TCEQ regulations.
- d. The eighteen baseline wells are distributed throughout the 36.1-acre production area of PA-1.

- e. The well development and sampling methodologies employed by UEC were appropriate and in accordance with accepted protocols.

10. This data establishes an average value for radium-226 of 1684.0, which greatly exceeds the EPA drinking water standard of 5 pCi/l for radium-226. Every one of the baseline wells have radium-226 values in excess of the 5 pCi/l standard. The lowest value is 10 pCi/l.

11. This data establishes an average value for uranium of .804 mg/l, which exceeds the EPA drinking water standard of .03 mg/l for uranium.

Later Sampling (Second and Third Rounds)

12. Constituent values in groundwater (including values for uranium and radium-226) naturally vary over time, even in the same location.

13. The variance in uranium levels between the sampling rounds is consistent with natural conditions and natural variability.

14. The radium data shows a number of baseline wells—PTWs 8, 9, 11, 12 and 14—for which the values decrease between rounds 1 and rounds 2. In PTWs 8, 9 and 14, the radium values continue to decrease in round 3. The data also shows that in some wells—PTWs 1, 4, 7, 10, and 13—the highest radium value occurs in the round 2, with both rounds 1 and 3 being lower.

15. Regardless, water quality data from the second and third rounds continues to show radium-226 values well in excess of the EPA drinking water standard in the baseline wells. Water quality data from the second and third rounds also continues to show average radium-226 values for the BMWs is in excess of the EPA drinking water standard.

16. The variance in radium-226 levels between the sampling rounds is consistent with natural conditions and natural variability.

17. The baseline groundwater summary table attached hereto as Attachment 4A includes values from all groundwater samples collected from baseline wells, including those collected at the time that the draft PAA was issued and those collected in rounds 2 and 3.

D. Control parameter upper limits

1. UEC's proposed upper limits control parameters are contained in Table 6.5 in the PAA-1 Application and Attachment 5 of the draft PAA, UR03075PAA1 (PAA1).

2. The control parameters proposed by UEC and set forth in the draft PAA are chloride and conductivity.

3. The control parameter upper limits for the production zone monitor wells (BMWs) were calculated by adding 25% to the highest recorded values for chloride and conductivity from those wells, BMW-1 through BMW-22.

4. The control parameters for the nonproduction zone monitor wells (OMWs) were calculated by adding 25% to the highest value recorded for chloride and conductivity from the those wells, OMW-1 through OMW-9.

5. Chloride and conductivity will provide timely detection of any migration of mining fluids.

a. Because of the production process, the mining fluid will contain elevated levels of chlorides.

b. Conductivity and chloride are conservative parameters in that they move with the groundwater without undergoing retardation.

6. As shown on the revised Attachment 4A, the highest values for the control parameters—chloride and conductivity—are different than the values listed in the draft PAA-1 and the PAA-1 Application due to the incorporation of the additional two sample sets. The upper limits control parameters contained Attachment 5 hereto are based upon the revised Attachment 4A, and thus incorporate those differences.

E. Monitor wells

1. The monitor wells for PA-1 are described in the PAA-1 Application and the draft PAA, UR03075PAA1 (PAA1).

2. The hydrologic test results and interpretation are included in Chapter 4 of the PAA-1 Application.

Production Zone Monitor Wells (BMW-1 through BMW-22; GW-1; GW-2)

3. UEC has installed twenty-two production zone monitoring wells, BMW-1 through BMW-22. These wells form a ring around the outside of the production area for PA-1, and each one is completed in Sand B, where the mining is proposed to occur. Each well has a 20-foot screen

4. Each of the BMWs was installed in accordance with the applicable TCEQ standards. Each well was properly cased and cemented from bottom to top.

5. Each of the BMWs are located within 400 feet from the production area for PA-1.

6. The angle formed by lines drawn from any one of the BMWs to the nearest BMW is not greater than 75 degrees. The spacing of the monitor wells is adequate to intercept excursions.

7. The hydrologic test results demonstrate that the BMWs are hydraulically connected to the production area.

8. Pursuant to the draft PAA-1, UEC will also install two additional production zone monitoring wells, GW-1 and GW-2 prior to the commencement of mining operations in PA-1. GW-1 and GW-2 will be located approximately 80 feet inside the monitor well ring and will

provide additional monitoring protection. An excursion in this location would be detected in the GWs before it would hit the monitor ring wells.

Nonproduction Zone Monitor Wells (OMW-1 through OMW-9)

9. UEC has installed nine (9) nonproduction zone monitor wells, OMW-1 through OMW-9.
10. Each of the OMWs was installed in accordance with the applicable TCEQ standards.
11. Each of these wells is located inside the production area for PA-1 and is completed in Sand A.
12. The PA-1 production area is approximately 36 acres. Thus, there is one OMW per every four acres of production area. 30 TAC § 331.103(b).

Buffer Zone

13. All designated monitoring wells (BMWs, GWs and OMWs) are located at least 100 feet inside the boundary of the Mine Permit Area.

F. Cost estimates for aquifer restoration and well plugging and abandonment

1. UEC meets the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331.
2. UEC's cost estimates for aquifer restoration and well plugging and abandonment for PA-1 are contained in Chapter 8 of the PAA-1 Application and in the draft PAA, UR03075PAA1 (PAA1), and they comply with all applicable regulatory requirements.
3. The cost estimate covers the plugging of monitoring wells, baseline wells and injectors/extractors in accordance with the closure plan, including all costs related thereto. The cost estimate accounts for the quantity of cement needed to cement each well from bottom to top, which will prevent movement of fluids through the wells out of the injection zone or to the land surface.
4. The cost estimate also includes a detailed estimate for the cost of restoration of groundwater in PA-1, including all costs related thereto. The estimate accounts for pumping and electrical costs, treatment costs, repairs and maintenance, labor, laboratory analysis, and operating expenses, while taking into account number and size of well patterns, screen lengths, effective porosity and a flare factor.

G. Other information required to evaluate the application

1. UEC included all applicable information required by the Executive Director in its PAA-1 Application and its response to the Executive Director's notice of deficiency.
2. UEC included all applicable information required by the instructions on the PAA application form promulgated by the Commission.

- a. UEC provided a map that locates and identifies the lease area, permit area, and existing and proposed production areas with respect to easily identifiable landmarks such as towns or main roads. This information is contained in Chapter 1.0 and Figure 1-3, Mine Location Map.
- b. UEC provided an oriented drawn to scale map locating all monitor wells, production wells, and baseline wells, and indicating acreage of the permit area, mine area, depth to the top of the production zone, and elevation of the production zone. This information is contained in Chapter 1.0 and Figure 1-4 Production Area Map.
- c. UEC provided detailed cross-sections along the dip and strike accurately identifying all overlying aquifers, the first underlying aquifer, and the geologic interval to be mined. The geologic interval identified as the "production zone" will be the zone authorized for production by the proposed authorization. The lithologic columns are supported with electric logs, and the piezometric levels are indicated. This information is contained in Chapter 3.0 and Figures 3-1 through 3-5a.
- d. UEC provided a written description of the geology and hydrology of the mine area, which is supported with maps, cross-sections showing geologic units, lithology, structural features, and other pertinent information. For hydrologic verification, a description of the major aquifer, hydraulic gradient, water quality indicators (i.e., TDS, Na, SO₄) for the mine area, and other pertinent information are included. This information is contained in Chapters 3.0 and 5.0.
- e. UEC provided maps showing piezometric levels and TDS contours for production and non-production zone aquifers with baseline wells located and identified. This information is contained in Chapter 5.0 and associated contour maps showing TDS and piezometric levels.
- f. UEC provided all required information regarding each of the monitor wells and the baseline wells completed in the production and non-production aquifers. This information is contained in Chapters 5.0 and 6.0.
- g. UEC provided a Restoration Progress Report:
 - 1) A description of restoration procedures or restoration demonstration procedures, proposed, in progress, or completed.
 - 2) A description of the restoration progress that currently has been achieved.
 - 3) A description of the fluid handling capacity of the disposal facilities required to accomplish restoration using the proposed restoration procedure within the time frame specified in the mine plan. This information is contained in Chapter 7.0.
- h. UEC provided a detailed calculation and tabulation of the volume of fluids to be handled by storage and disposal facilities at their maximum, and comparative capacity of the facilities that will be available. This information is contained in Chapter 7.0 and Table 7.2, Updated Fluid Handling Requirements vs. Capacity.

H. Whether the application for PAA-1 complies with all applicable statutory and regulatory requirements.

1. The PAA-1 Application complies with all applicable statutory and regulatory requirements.

VIII. Other Findings

1. Based on the above findings of fact, the use or installation of the injection wells is in the public interest.

2. Based on the above findings of fact, no existing rights, including, but not limited to, mineral rights, will be impaired.

3. Based on the above findings of fact, both groundwater and surface fresh water can be adequately protected from pollution with proper safeguards. The draft Mine Permit and draft PAA-1 impose terms and conditions reasonably necessary to protect fresh water from pollution.

4. Based on the above findings of fact, UEC has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.

CONCLUSIONS OF LAW

IX. Jurisdiction

A. Under the EPA-approved Texas UIC program, TCEQ has exclusive regulatory jurisdiction over the drilling and use of all Class III injection wells for the in situ mining of minerals, including uranium. 40 C.F.R. § 147.2200; *see* 30 TEX. ADMIN. CODE § 331.11(a)(2).

B. The Commission has jurisdiction over UEC's application for Class III UIC area permit UR03075, its request for an aquifer exemption, and its application for production area authorization UR03075PAA1 as part of the Commission's authority to permit Class III injection wells, pursuant to TEX. WATER CODE §§ 5.013(a)(8) and 27.011.

C. Based on the findings of fact set forth in Section III above, public notice of UEC's application for Class III UIC area permit UR03075 and request for aquifer exemption and application for production area authorization UR03075PAA1 were given as required by the Texas Water Code and Title 30 of the Texas Administrative Code (TAC), and affected persons were provided an opportunity to request a hearing on UEC's applications in the manner required by law.

D. The Commission has authority to hold hearings concerning UEC's applications, pursuant to the provisions of Sections 5.102(b) and 27.018 of the Texas Water Code.

E. Proper notice of the hearing and the preliminary hearing was given to affected persons pursuant to Sections 2001.051 and 2001.052 of the Texas Government Code and Section 27.018 of the Texas Water Code.

F. SOAH has jurisdiction to conduct a hearing and to prepare a Proposal for Decision (“PFD”) in this matter. TEX. GOV’T CODE § 2001.047.

X. Burden of Proof

As to the applications referred by the Commission to SOAH, UEC has the burden of proving that its application for Class III UIC area permit UR03075, its request for an aquifer exemption, and its application for production area authorization UR03075PAA1 comply with applicable law by a preponderance of the evidence. 30 TAC § 80.17(a).

XI. Mine Application

A. Whether the use and installation of the injection wells are in the public interest under Texas Water Code §27.051(a). Public interest in regard to this issue includes whether UEC’s mining operation or restoration activities will adversely impact the public interest by unreasonably reducing the amount of groundwater available for permitting by the Goliad County Groundwater Conservation District.

1. Based on the findings of fact set forth in and/or incorporated into Section VI.A above, the use and installation of the injection wells are in the public interest under Texas Water Code §27.051(a).

2. The Commission, in determining if the use or installation of an injection well is in the public interest under Section 27.051(a)(1) of the Texas Water Code, “shall consider, but shall not be limited to the consideration of: (1) compliance history of the applicant and related entities under the method for evaluating compliance history developed by [TCEQ] under Section 5.754 and in accordance with the provisions of Subsection (e); [and] (2) whether there is a practical, economic, and feasible alternative to an injection well reasonably available.”⁶ TEX. WATER CODE ANN. § 27.051(d) (Vernon Supp. 2009).

3. In making the public interest determination, the Commission must also take into consideration the “public health and welfare” and “the operation of existing industries.” TEX. WATER CODE ANN. § 27.003. The Commission must also consider the “economic development of the state,” which benefits both the public welfare and the continued operation of existing industries. *Id.*

4. Additionally, in *Texas Citizens for a Safe Future and Clean Water v. Railroad Comm'n of Texas*, 254 S.W.3d 492 (Tex. App. – Austin 2007, pet. granted), the Austin Court of Appeals held that public-safety concerns should be considered as part of the public interest inquiry, if evidence of such concerns is presented. *Id.* at 503.

5. Under Subchapter D of Chapter 36, groundwater conservation districts are granted the authority to manage, conserve, and protect groundwater resources through both rulemaking and permitting. TEX. WATER CODE ANN. § 36.101(a) (rulemaking); *Id.* § 36.113(a) (permitting).

⁶ A third statutory factor – whether the applicant will maintain sufficient liability insurance for bodily injury and property damage to third parties caused by accidents – applies only to permits for injection wells that “will be used for the disposal of hazardous waste.” *Id.* § 27.051(d)(3).

6. Although Chapter 36 generally authorizes a groundwater conservation district to regulate groundwater production by limiting the amount of water produced, such “limitations may be imposed “only when done uniformly” so that all new uses are “treated equally.” *Guitar Holding Co., L.P. v. Hudspeth County Underground Water Conservation Dist. No. 1*, 263 S.W.3d 910, 917-18 (Tex. 2008) (citing TEX. WATER CODE ANN. § 36.113(e) (Vernon 2008)); *see also* TEX. WATER CODE ANN. § 36.101(a) (requiring groundwater conservation districts “to develop rules that are fair and impartial”). As a result, the District lacks authority to single out an adjacent landowner to offset exempt or excessive groundwater usage by a third party.

7. Moreover, Section 36.117 of Subchapter D expressly provides that Chapter 36 does not apply to production or injection wells drilled for in situ uranium mining. *Id.* § 36.117(l).

B. Does the Applicant’s compliance history require denial of the application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.B above, the Applicant’s compliance history does not require denial of the Mine Application under Tex. Water Code § 27.051(e) and 30 TAC Chapter 60.

2. Section 27.051(d) of the Texas Water Code provides that in making the public interest determination, TCEQ shall consider the “compliance history of the applicant and related entities under the method for evaluating compliance history developed by the [C]ommission under Section 5.754 and in accordance with the provisions of Subsection (e).” Section 27.051(h) likewise provides that in making the public interest determination, the Commission must consider the applicant’s compliance history in accordance with the “rules adopted and procedures developed” by the commission under Sections 5.753 and 5.754.

3. Section 5.753 of the Texas Water Code requires TCEQ to promulgate rules establishing “a uniform standard for evaluating compliance history.” Section 5.754 requires TCEQ to promulgate rules related to the classification and use of an applicant’s compliance history in permitting proceedings. In compliance with these statutes, the Commission promulgated Chapter 60 of Title 30 of the Texas Administrative Code.

4. Section 60.1 identifies the components of a person’s compliance history. Notices of violations issued by the RCT are not components of an applicant’s compliance history under Section 60.1.

5. Section 60.2 sets forth the method by which a person’s compliance history is classified – *i.e.*, as “high,” “average” or “poor.” Section 60.2 provides that “[i]f there is no compliance information about the site at the time the executive director develops the compliance history classification, then the classification shall be designated as ‘average performer by default.’”

6. The compliance history prepared by the Executive Director was prepared in accordance with Texas Water Code § 27.051(e) and 30 TAC Chapter 60.

7. Section 5.754 of the Texas Water Code requires the Commission to establish a set of standards for the use of an applicant’s compliance history in various regulatory contexts, including permitting proceedings. It provides that TCEQ shall deny a permit application if the

applicant's compliance history "is unacceptable based on violations constituting a recurring pattern of conduct that demonstrates a consistent disregard for the regulatory process, including a failure to make a timely and substantial attempt to correct the violations."

8. Section 60.3 of Title 30 of the Texas Administrative Code sets forth how a person's compliance history is used in permitting proceedings. Section 60.3(a)(1)(3)(E) provides: "The commission shall deny an application for permit or permit amendment when the person has an unacceptable compliance history based on violations constituting a recurring pattern of conduct that demonstrates a consistent disregard for the regulatory process, including a failure to make a timely and substantial attempt to correct the violation(s). This includes violation of provisions in commission orders or court injunctions, judgments, or decrees designed to protect human health or the environment."

9. Section 331.120(d) of Title 30 of the Texas Administrative Code provides: "The commission shall deny the permit application in cases where the commission concludes that the applicant's compliance history is unacceptable. Whether a compliance history is unacceptable will be determined by the commission on a case-by-case basis. In making this determination, the commission will consider the nature, duration, repetition, and potential impact of violations for all media. The commission will give special weight to violations involving the failure of the applicant to obtain a permit and other violations which indicate the applicant's tendency to engage in activities without seeking appropriate authorization from the commission."

10. Based on the findings of fact set forth in and/or incorporated into Section VI.B above, the UEC's compliance history is not unacceptable under Section 331.120 of Title 30 of the Texas Administrative Code.

C. Does the application adequately and accurately describe baseline conditions of the groundwater in the proposed permitted area under applicable requirements of 30 TAC Chapter 331?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.C above, the application adequately and accurately describe baseline conditions of the groundwater in the proposed permitted area under applicable requirements of 30 TAC Chapter 331.

2. Baseline quality is defined as "[t]he parameters and their concentrations that describe the local groundwater quality of an aquifer prior to the beginning of injection operations." 30 TAC § 331.2(12).

3. The area of review for a mine permit is the area within the boundary of the permit plus a circumscribing minimum ¼ mile area. 30 TAC § 331.2(9).

4. No Chapter 331 regulation mentions "regional baseline wells," except for the definition of baseline well found in 30 TAC § 331.2(13).

D. Does the application meet all applicable criteria of 30 TAC § 331.122, related to required consideration by the Commission prior to issuing a Class III Injection Well Area Permit?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.D above, the application meets all applicable criteria of 30 TAC § 331.122, related to required consideration by the Commission prior to issuing a Class III Injection Well Area Permit.
2. Section 331.122 provides a laundry list of items the Commission “shall consider” in its administrative and technical review before issuing an area permit.
3. Once a borehole is plugged or has collapsed, it no longer meets the Chapter 331 definition of a well.

E. Has the Applicant demonstrated that the proposed exempted aquifer meets the applicable criteria of 30 TAC § 331.13?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.E above, UEC has demonstrated that the proposed exempted aquifer meets the applicable criteria of 30 TAC § 331.13.
2. For a portion of an aquifer to be exempted, Section 331.13 requires that the portion of the aquifer (1) not currently serve as a source of drinking water for human consumption; and (2) will not in the future serve as a source of drinking water for human consumption for one or more specified reasons. 30 TAC § 331.13(c)(1), (2).
3. The test for the first criteria (*i.e.*, that the portion of the aquifer not currently serve as a source of drinking water) is whether or not anyone is “currently using water for human consumption from the [aquifer] in the specific lateral boundary” of the proposed exemption area. 50 Fed. Reg. 5253 (February 7, 1985), at 5253; 55 Fed. Reg. 21191 (May 23, 1990), at 21192.
4. The second criteria under Section 331.13 is that the portion of the aquifer sought to be exempt will not in the future serve as a source of drinking water for human consumption for one or more specified reasons. Those reasons include:

(A) It is mineral, hydrocarbon or geothermal energy bearing with production capability;

... *or*

(C) It is so contaminated that it would be economically or technologically impractical to render the water fit for human consumption. ...

30 TAC § 331.13(c)(2)(A), (C) (emphasis added).

5. UEC is not required to show that the proposed exemption area meets *both* of the alternative grounds under the second criteria – *i.e.*, that it is mineral-bearing with production capability *and* not fit for human consumption. Rather, either finding is adequate independent grounds for exempting the aquifer portion, where the portion being exempted does not currently serve as a source of drinking water. 50 Fed. Reg. 5253 (February 7, 1985), at 5253; *see* 55 Fed. Reg. 21191 (May 23, 1990), at 21192.
6. Based on the findings of fact set forth in and/or incorporated into Section VI.E above, the proposed aquifer exemption area was properly delineated.

7. The purpose of an engineer's seal is "to assure the user of the engineering product that the work has been performed or directly supervised by the professional engineer. ..." 22 TAC § 137.33(a).

F. Is the application sufficiently protective of groundwater quality?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.F above, the application is sufficiently protective of groundwater quality.

G. Does the application adequately characterize and describe the geology and hydrology in the proposed permit area, including fault lines, under the applicable rules?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.G above, the application adequately characterize and describe the geology and hydrology in the proposed permit area, including fault lines, under the applicable rules.

H. Do the geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.H above, the geologic and hydraulic properties of the proposed permit area indicate that the Applicant will be able to comply with rule requirements.

2. Hydrologic testing is not required for a Class III Underground Injection Control permit, although an applicant must provide a description of the proposed hydrologic testing program. 30 TAC § 331.122(2)(G).

3. Prior to the conducting of any mining operations near the Northwest Fault, UEC will have to apply for, and the Commission will have to issue a production area authorization for one of the other three proposed production areas.

4. The results of the hydrologic testing program must be submitted with an application for a production area authorization, which is needed to mine an ore body within a permit area. 30 TAC § 305.49(b)(6).

I. Does the Applicant meet the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.I above, the Applicant meet the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331.

2. Section 27.051(a)(4) of the Texas Water Code provides that a permit may be issued if the Commission finds that the applicant has made a satisfactory showing of financial responsibility if such showing is required by Section 27.073.

3. Section 27.073(a-1), in turn, requires a person to whom an in situ uranium mining injection, monitoring or production well permit is issued to maintain financial security to ensure that each abandoned well is properly plugged.

4. Chapter 37 of the TCEQ rules describes acceptable forms of financial assurance, specifies the precise wording of the various instruments that may be used, and imposes requirements to insure that the issuer or trustee of the instrument is solvent and financially and otherwise qualified to perform if called upon. 30 TAC §§ 37.71, 37.201, 37.231, 37.211, 37.301, 37.321, 37.331.

5. In addition, Section 37.7021 of Chapter 37 addresses the timing of the provision of financial assurance. It provides that financial assurance for well plugging and abandonment must “be in effect before commencement of drilling operations.” 30 TAC § 37.7021(c).

4. Section 331.143 of the TCEQ rules requires (a) the preparation of a written cost estimate of plugging the wells; (b) that this cost estimate take into account all applicable costs and be kept at the facility for the life of the project; and (c) that this cost estimate be reviewed and updated as necessary on an annual basis, including adjustments for inflation.

5. Section 331.143 also incorporates by reference the requirements listed in Sections 331.46 and 331.86. Section 331.46 contains requirements that well plugs shall not allow the movement of fluids through the wells, out of the injection zone or to the land surface and shall consist of cement or an equally protective material; closure plans must demonstrate that no movement of contaminants that will cause pollution from the production zone into a USDW will occur; and lists factors for consideration in determining the adequacy of plugging and abandonment plans.

6. Section 331.86 lays out the timeframe for effectuating plugging and abandonment and requires written acknowledgment from the Executive Director after the fact. Indeed, under Section 331.144, financial assurance cannot be released without the written approval of the Executive Director.

J. Is the application sufficiently protective of surface water quality?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.J above, the application is sufficiently protective of surface water quality.

2. In the context of uranium mining, an RML is a license that authorizes the possession, receipt, processing, and temporary storage of natural uranium prior to transfer to authorized recipients. 30 TAC §§ 336.1, 336.211. An RML also authorizes temporary storage of byproduct material (waste) prior to transfer to authorized recipients and authorized disposal facilities. *Id.* at § 336.1101.

3. The RML application process focuses on facility design and standard operating procedures that ensure the safety of workers, the environment and members of the public from radiation exposure. 30 TAC § 336.304.

4. Applicants for an RML must examine levels of radiological exposure to facility workers and members of the public via various pathways, including surface water. 30 TAC §§ 336.301 – 336.368 (Subchapter D, Standards for Protection Against Radiation).

5. An integral part of an RML application includes an Operational Safety and Emergency Procedures (OSEP) to specifically address potential exposure to employees and the public; it also provides procedures for ensuring that potential exposures are minimized to the lowest extent possible. 30 TAC § 336.210.

6. Prior to license termination, the licensee must demonstrate that the license area qualifies for unrestricted use. 30 TAC §§ 336.601 – 336.627 (Subchapter G, Decommissioning Standards). This demonstration is rigorously conducted with extensive radiological surveys and sampling and must be verified by TCEQ. *Id.* at § 336.607.

K. Are local roadways sufficient to handle traffic to and from the proposed facility?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.K above, Local roadways are sufficient to handle traffic to and from the proposed facility.

L. Whether UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate.

1. Based on the findings of fact set forth in and/or incorporated into Section VI.L above, UEC's proposal for restoration of groundwater to baseline levels as contained in the permit application is reasonable and adequate.

2. In determining whether or not to grant a restoration amendment, the Commission must consider the following:

- (A) uses for which the groundwater in the production area was suitable at baseline water quality levels;
- (B) actual existing use of groundwater in the production area prior to and during mining;
- (C) potential future use of groundwater of baseline quality and of proposed restoration quality;
- (D) the effort made by the permittee to restore the groundwater to baseline;
- (E) technology available to restore groundwater for particular parameters;
- (F) the ability of existing technology to restore groundwater to baseline quality in the area under consideration;
- (G) the cost of further restoration efforts;
- (H) the consumption of groundwater resources during further restoration; and
- (I) the harmful effects of levels of particular parameter.

30 TAC § 331.107(g)(1).

3. The Commission may amend the restoration table if it finds that:

- (A) reasonable restoration efforts have been undertaken, giving consideration to the factors listed in paragraph (1) of this subsection;
- (B) the values for the parameters describing water quality have stabilized for a period of one year;
- (C) the formation water present in the exempted portion of the aquifer would be suitable for any use to which it was reasonably suited prior to mining; and
- (D) further restoration efforts would consume energy, water, or other natural resources of the state without providing a corresponding benefit to the state.

30 TAC § 331.107(g)(2).

M. Will the Applicant's proposed activities negatively impact livestock and wildlife, including endangered species?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.M above, the Applicant's proposed activities will not negatively impact livestock and wildlife, including endangered species.

2. The TCEQ has identified certain types of facilities that it "has determined will not make a significant contribution of air contaminants to the atmosphere." 30 TAC § 106.1. These facilities are automatically issued an air quality Permit-by-Rule upon demonstrating that all applicable conditions will be satisfied.

3. One such type of facility is a uranium in-situ solution recovery facility that has no emissions other than: "(A) ammonia which shall not exceed an emission rate of 2.0 pounds per hour (lb/hr); and (B) particulate dust from yellowcake drying not to exceed 0.1 lb/hr." 30 TAC § 106.416.

4. Applicants for an RML must examine levels of radiological exposure to facility workers and members of the public via various pathways such as air, soils, surface water, and food chain (crops, cattle, etc.). 30 TAC §§ 336.301 – 336.368 (Subchapter D, Standards for Protection Against Radiation).

N. Will the Applicant's proposed activities negatively impact the use of property?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.N above, the Applicant's proposed activities will not negatively impact the use of property.

2. The issuance of an injection well permit "does not convey any property rights of any sort" and "does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations." 30 TAC § 305.122 (b)-(c); *see also id.* § 305.125(16) (providing that all injection well permits must include a condition stating that it "does not convey any property rights of any sort, or any exclusive privilege").

3. An applicant for an injection well establishes a prima facie case on the issue of impairment of existing rights by demonstrating compliance with the TCEQ rules, and the burden

of proof then shifts to the protestant. To establish that his existing rights will be impaired, a protestant must prove actual harm or injury. *FPL Farming, Ltd. v. Texas Natural Resource Conservation Comm'n*, 2003 WL 247183, *1 (Tex. App. – Austin 2003, pet. denied).

O. Will the Applicant's proposed activities adversely affect public health and welfare?

1. Based on the findings of fact set forth in and/or incorporated into Section VI.O above, the Applicant's proposed activities will not adversely affect public health and welfare.

P. Whether the proposed mining is in the recharge zone of the Gulf Coast Aquifer (Evangeline component).

1. There is no regulatory prohibition against conducting in situ uranium mining in a recharge zone.

Q. Whether the Gulf Coast Aquifer is a confined aquifer in the areas of Goliad County where UEC will conduct UIC activities.

1. There is no regulatory prohibition against conducting in situ uranium mining in an unconfined aquifer.

2. Prior to the conducting of any mining operations in Sand A, UEC will have to apply for, and the Commission will have to issue a production area authorization for a production area in Sand A.

R. Whether mining fluids will migrate vertically or horizontally and contaminate an USDW (underground source of drinking water).

1. Based on the findings of fact set forth in and/or incorporated into Section VI.R above, mining fluids will not migrate vertically or horizontally and contaminate an USDW.

2. The current version of the Railroad Commission's plugging rule, 16 TAC § 11.138, became effective on May 7, 1982, and requires that boreholes be plugged in a manner that prevents the mixing of water from different sand units within the hole.

3. Prior to commencing mining operations in any additional production area(s), UEC will have to apply for, and the Commission will have to issue a production area authorization. To obtain a production area authorization, an applicant must design and conduct a hydrologic testing program for the production area in which it seeks authorization to mine and must submit the results of such hydrologic testing as a part of its PAA application.

S. Whether there are any USDWs within the injection zones proposed by UEC.

1. Under the TCEQ rules, a USDW is an aquifer or its portions (A) which supplies drinking water for human consumption; or (B) in which the groundwater contains fewer than 10,000 milligrams per liter total dissolved solids; and (C) which is not an exempted aquifer. 30 TAC § 331.2(107).

2. Under federal regulations, a USDW is an aquifer or its portions that meets the latter two criteria, plus currently supplies drinking water for human consumption and contains a sufficient quantity of water to supply a public water system *or* supplies any public water system. 40 CFR §146.3.

T. Whether any USDWs within Goliad County will be adversely impacted by UEC's proposed in situ uranium operations.

1. Based on the findings of fact set forth in and/or incorporated into Section VI.T above, no USDWs within Goliad County will be adversely impacted by UEC's proposed in situ uranium operations.

2. UEC cannot conduct the proposed in situ uranium operations unless the Commission and EPA grant the requested aquifer exemption.

3. Once an aquifer exemption is granted by the Commission and approved by EPA, the exempted aquifer is no longer a USDW.

U. Whether there is a "practical, economic and feasible alternative to an injection well reasonably available" within the meaning of that term as set forth in TWC § 27.051(d)(2).

1. Based on the findings of fact set forth in and/or incorporated into Section VI.U above, there is no "practical, economic and feasible alternative to an injection well reasonably available" within the meaning of that term as set forth in TWC § 27.051(d)(2).

2. Section 27.051(d) of the Texas Water Code provides that in determining if the use or installation of an injection well is in the public interest, the Commission must consider whether there is an alternative to "an injection well," not whether there is an alternative to the proposed injection well *location*.

XII. PAA-1 Application

A. Mine Plan

1. Based on the findings of fact set forth in and/or incorporated into Section VII.A above, the PAA-1 Application's mine plan complies with all applicable regulatory requirements.

2. A mine plan is defined as a plan for operations at a mine, consisting of: (A) a map of the permit area identifying the location and extent of existing and proposed production areas; and (B) an estimated schedule indicating the sequence and timetable for mining and any required aquifer restoration. 30 TAC § 331.2(63).

B. Restoration Table

1. Based on the findings of fact set forth in and/or incorporated into Section VII.B above, the PAA-1 Application's restoration table complies with all applicable regulatory requirements.

2. A restoration table must include all parameters in the suite established in accordance with the requirements of §331.104(b). 30 TAC § 331.107(a)(1).

3. Under 30 TAC § 331.104(b), any of the parameters in the suite, except for uranium and radium-226, may be removed from the list of restoration parameters if an applicant can demonstrate that a parameter or parameters is not a suitable restoration parameter.

4. When UEC filed its PAA-1 Application, the TCEQ regulations required that each production area authorization contain a restoration table developed by using either:

- (1) the higher value in either the column headed mine area average or the column headed production area average for parameters shown on the production area baseline water quality form for the production zone; or
- (2) predictions of restoration quality that are reasonably certain after giving consideration to the factors specified in §331.107(f) of this title (relating to Restoration).

30 TAC § 331.104(d) (West 2008).

5. Under the current TCEQ regulations, the restoration values shall consist of either:

- (a) the mean concentration or value for that parameter based on all measurements from groundwater samples collected from baseline wells prior to mining activities; or
- (b) a statistical analysis of baseline well information proposed by the owner or operator and approved by the executive director that demonstrates that the restoration table value is representative of baseline quality.

30 TAC § 331.107(a)(1).

C. Baseline water quality table

1. Based on the findings of fact set forth in and/or incorporated into Section VII.C above, the PAA-1 Application's baseline table complies with all applicable regulatory requirements.

2. A baseline water table must be submitted with an application for a production area authorization. 30 TAC § 305.49(b)(3).

3. The baseline water table or groundwater analysis report summary serves as the basis for the restoration table. Figure 3 of the application form promulgated by the Commission sets forth the format of the groundwater analysis report summary.

4. When UEC filed its PAA-1 Application, the TCEQ regulations required one or more samples from each designated monitor well (production and nonproduction zone) and each designated production well in the production area, to be summarized as follows:

- (1) mine area baseline-the averages and ranges of the parameter values determined for the designated production zone monitor wells;

- (2) production area baseline-the averages and ranges of the parameter values determined from at least five designated production zone wells in the production area; and
- (3) nonproduction zone baseline-the averages and ranges by zone of the parameter values determined for designated nonproduction zone monitor wells.

30 TAC § 331.104 (West 2008).

5. The requirements of the current TCEQ regulations are similar in many ways, specifying independent and representative samples from:

- (1) mine area monitor wells completed in the production zone;
- (2) mine area monitor wells completed in nonproduction zones; and
- (3) baseline wells completed in the production zone within the production area.

30 TAC § 331.104(a).

6. Under the current TCEQ regulations, however, the number of wells must be “a minimum of five baseline wells, or one baseline well for every four acres of production area, whichever is greater . . . completed within the production zone of the production area.” 30 TAC § 331.104(c).

7. UEC was not obligated to amend its PAA-1 Application to include water quality data obtained after issuance of the draft PAA.

8. Baseline wells must be completed “in the production zone.” 30 TAC § 331.104(a)-(b). The TCEQ regulations do not require that the wells be fully screen across the entire thickness of the sand unit.

D. Control parameter upper limits

1. Based on the findings of fact set forth in and/or incorporated into Section VII.D above, the PAA-1 Application’s proposed control parameter upper limits comply with all applicable regulatory requirements.

2. The draft PAA, UR03075PAA1 (PAA1), establishes conductivity and chloride as the two control parameters to be used, and prescribed the manner of calculation for the upper limit values to be used in production and non-production zones.

3. Control parameter upper limits for production zone monitor wells are to be derived from pre-mining groundwater sample data from production zone monitor wells, and control parameter upper limits for nonproduction zone monitor wells are to be derived from pre-mining groundwater sample data from nonproduction zone monitor wells. 30 TAC § 331.104(e).

4. The PAA application form promulgated by the Commission instructs applicants to provide a proposed control parameter table based on the groundwater analysis summary table with the control parameter upper limit being either 25% or 5 mg/l above the highest value for each control parameter.

E. Monitor wells

1. Based on the findings of fact set forth in and/or incorporated into Section VII.E above, the monitor wells for the proposed production area comply with all applicable regulatory requirements.
2. The number, placement and construction of the monitor wells conforms to the requirements of Sections 331.82, 103 and 104; all applicable requirements have been met.

Production Zone Monitor Wells (BMW-1 through BMW-22; GW-1; GW-2)

2. “Designated production zone monitor wells shall be spaced no greater than 400 feet from the production area, as determined by exploratory drilling. The angle formed by lines drawn from any production well to the two nearest monitor wells will not be greater than 75 degrees. 30 TAC § 331.103(a).

Nonproduction Zone Monitor Wells (OMW-1 through OMW-9)

3. “At a minimum, designated nonproduction zone monitor wells shall be completed in the production area in any freshwater aquifer overlying the production zone. These wells shall be located with a minimum of one per every four acres of production area for wells completed in the first overlying freshwater aquifer” 30 TAC § 331.103(b).
4. The applicable regulatory requirements do not require monitoring in Sand C.

Buffer Zone

5. Designated monitoring wells must be installed at least 100 feet inside any permit area boundary.

F. Cost estimates for aquifer restoration and well plugging and abandonment

1. Based on the findings of fact set forth in and/or incorporated into Section VII.F above, UEC meets the applicable requirements for financial assurance under Texas Water Code §§ 27.051, 27.073, and 30 TAC Chapters 37 and 331.
2. The cost estimates for aquifer restoration and well plugging and abandonment related to the PAA-1 Application comply with all applicable regulatory requirements.
2. Section 331.143 of the TCEQ rules requires (a) the preparation of written cost estimates of plugging and abandonment and aquifer restoration; (b) that these cost estimates take into account all costs related to these activities and be kept at the facility for the life of the project; and (c) that these estimates be reviewed and updated as necessary on an annual basis, including adjustments for inflation.
3. Section 331.46 of the TCEQ rules contains requirements that well plugs shall not allow the movement of fluids through the wells, out of the injection zone or to the land surface and shall consist of cement or an equally protective material; closure plans must demonstrate that no

movement of contaminants that will cause pollution from the production zone into a USDW will occur; and lists factors for consideration in determining the adequacy of plugging and abandonment plans.

G. Other information required to evaluate the application

1. Based on the findings of fact set forth in and/or incorporated into Section VII.G above, UEC included all of the additional applicable information required by the Executive Director in its PAA-1 Application and its response to the Executive Director's notice of deficiency.
2. Based on the findings of fact set forth in and/or incorporated into Section VII.G above, UEC included all of the additional applicable information required by the instructions on the PAA application form promulgated by the Commission.
3. Based on the findings of fact set forth in Section VII above, UEC submitted all data, information and items required by the applicable regulatory requirements related to the PAA-1 Application, and the Commission considered all such data, information and items.

H. Whether the application for PAA-1 complies with all applicable statutory and regulatory requirements.

1. Based on the findings of fact set forth in Section VII above, the PAA-1 Application complies with all applicable regulatory requirements.

XIII. Transcript Costs

1. The following factors are to be considered in allocating reporting and transcription costs among the parties: (1) the party who requested the transcript, (2) the financial ability of the party to pay the costs, (3) the extent to which the party participated in the hearing, (4) the relative benefits to the various parties of having a transcript, (5) the budgetary constraints of a state or federal administrative agency participating in the proceeding, and (6) any other factor which is relevant to a just and reasonable assessment of costs. 30 TAC § 80.23(d).
2. The cost of the transcript costs shall be apportioned equally between UEC, the County, and the District. Each of those three parties should pay one-third of the costs of the transcript.

XIV. Other Conclusions

1. Based on the findings of fact set forth herein, the use or installation of the injection well(s) is in the public interest.
2. Based on the findings of fact set forth herein, no existing rights, including, but not limited to, mineral rights, will be impaired.
3. Based on the findings of fact set forth herein, both groundwater and surface fresh water can be adequately protected from pollution with proper safeguards. The draft Mine Permit and draft PAA-1 impose terms and conditions reasonably necessary to protect fresh water from pollution.

4. Based on the findings of fact set forth herein, UEC has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.

Date: October 22, 2010.

ATTACHMENT 4A
BASELINE WATER QUALITY TABLE
GOLIAD PROJECT SAND B PRODUCTION ZONE

PRODUCTION ZONE									WELL ID BY AREA*	
Parameter	Units	Mine Area**			Production Area			Production Zone		
		Low	Ave.	High	Low	Ave.	High	Mine	Prod.	
1	Calcium	mg/l	82	97	110	81	96	110	BMW-1	PTW-1
2	Magnesium	mg/l	14.5	17.5	20	10.9	17.8	20.3	BMW-2	PTW-2
3	Sodium	mg/l	93	105	120	82	97	117	BMW-3	PTW-3
4	Potassium	mg/l	2.92	3.79	5.13	2.5	6.4	16.5	BMW-4	PTW-4
5	Carbonate	mg/l	0	0	0	0	0	3	BMW-5	PTW-5
6	Bicarbonate	mg/l	294	319	350	251	308	368	BMW-6	PTW-6
7	Sulfate	mg/l	15	58	89	1	43.2	82	BMW-7	PTW-7
8	Chloride	mg/l	158	165	172	150	164	180	BMW-8	PTW-8
9	Fluoride	mg/l	0.51	0.58	0.65	0.50	0.58	0.80	BMW-9	PTW-9
10	Nitrate-N	mg/l	<0.01	0.01	0.01	0.01	0.14	1.73	BMW-10	PTW-10
11	Silica	mg/l	12.3	15.7	18.1	0.1	31.6	37.5	BMW-11	PTW-11
12	pH	std. units	7.28	7.58	8.18	7.18	7.48	7.96	BMW-12	PTW-12
13	TDS	mg/l	575	652	705	390	586	698	BMW-13	PTW-13
14	Conductivity	µmhos	1040	1104	1140	950	1084	1190	BMW-14	PTW-14
15	Alkalinity	mg/l	241	262	287	206	255	302	BMW-15	RBLB-1
16	Ammonia-N	mg/l	<0.1	0.1	0.2	0.05	<0.1	0.3	BMW-16	RBLB-3
17	Arsenic	mg/l	<2E-3	8E-3	0.069	0.002	0.011	0.030	BMW-17	RBLB-4
18	Cadmium	mg/l	<1E-3	1E-3	<1E-3	<0.001	<0.007	<1E-2	BMW-18	RBLB-5
19	Iron	mg/l	<3E-2	0.043	0.196	<0.03	0.068	0.320	BMW-19	
20	Lead	mg/l	<2E-3	2E-3	2E-3	<0.002	0.026	0.05	BMW-20	
21	Manganese	mg/l	0.007	0.017	0.050	<0.010	0.027	0.050	BMW-21	
22	Mercury	mg/l	4E-4	<4E-4	<4E-4	<0.0001	0.0002	<0.001	BMW-22	
23	Molybdenum	mg/l	<0.01	0.035	0.481	<0.01	0.185	0.500		
24	Selenium	mg/l	<3E-3	3E-3	6E-3	<0.003	0.007	0.010		
25	Uranium	mg/l	<1E-3	0.020	0.188	<0.003	0.050	0.804		
26	Radium-226	pCi/l	0.9	12.1	41	10.0	391.0	2000.0		

* List the identification numbers of wells used to obtain the high and low values for each parameter

**Monitor Wells

**ATTACHMENT 5
CONTROL PARAMETER UPPER LIMITS TABLE**

Production Zone	
Control Parameter	Sand B
Chloride, mg/l	225
Conductivity, μ hos/cm	1488

Non-Production Zone	
Control Parameter	Sand A 1st Overlying Aquifer
Chloride, mg/l	730
Conductivity, μ hos/cm	3,062

**ATTACHMENT 6
RESTORATION TABLE**

<u>Parameter</u>	<u>Unit</u>	<u>Concentration</u>
Calcium	mg/l	96
Magnesium	mg/l	17.8
Sodium	mg/l	97
Potassium	mg/l	6.4
Carbonate	mg/l	0
Bicarbonate	mg/l	308
Sulfate	mg/l	43
Chloride	mg/l	164
Nitrate-N	mg/l	0.14
Fluoride	mg/l	0.58
Silica	mg/l	31.6
TDS	mg/l	586
Conductivity	µmhos/cm	1084
Alkalinity	mg/l as CaCO ₃	255
pH	Std. Units	7.18 to 7.96
Arsenic	mg/l	0.011
Iron	mg/l	0.068
Manganese	mg/l	0.027
Molybdenum	mg/l	0.185
Selenium	mg/l	0.007
Uranium	mg/l	0.050
Radium ²²⁶	pCi/l	391.0