THE GOLIAD COUNTY GROUNDWATER CONSERVATION DISTRICT
PRESENTATION TO
THE ENVIRONMENTAL PROTECTION AGENCY
AUGUST 6, 2012

On November 6, 2001, Goliad County residents approved the formation of a Groundwater Conservation District (GCGCD). The purpose of the District is to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, in accordance with Chapter 36, State Water Code.

The Directors of GCGCD thank you for the opportunity to meet with you today to continue the dialogue in reference to the proposed uranium mining permit UR-03075 and the associated aquifer exemption.

RESIDENCES AND CHURCH DWELLINGS IN VICINITY OF THE AQUIFER EXEMPTION

With the issuance of the draft permit for public comment by TCEQ, many area residents and organizations responded with questions and comments. As noted in our previous letter, TCEQ issued 188 responses to approximately 350 concerns and questions. Today's meeting focuses on the protection of the drinking water for residents located in close proximity outside of the aquifer exemption boundary. In the TCEQ response #13, it states that "Individuals may protect their rights by contacting local law enforcement or seeking redress in a civil proceeding". GCGCD supports the position of the EPA that modeling should be done to provide a thorough technical analysis of the project to determine if resident's groundwater supply is protected.

In reference to the map, please note that there are a number of residences that ring the perimeter of the requested aquifer exemption. There are 18 residences and 1 church in the first segment, followed by many more residences expanding outward. A special note about the church is that it does not only function as a religious place but also as a community center. Many social activities such as clubs, birthday parties, and family reunions are held at the church hall. GCGCD does not have the legal description of the aquifer exemption boundary, but by using to scale maps supplied with the permit application, the distance to this first segment of drinking water supply wells ranges from less than a 1000 feet to 3000 feet.

MIGRATION OF GROUNDWATER

The water at these residents and at the church comes from the same aquifer that exists in the aquifer exemption area. The regional migration of groundwater from north-west to south-east does not tell the whole story for local migration. A review of the cross-sections provided in the permit application shows considerable variability in elevations and thickness of the aquifer sands, see power point. At the faults, there are connections from one sand zone to another through the fault. The model presented by UEC during the contested case hearing showed localized groundwater in an area flowing to the north-west. The above data demonstrates that the groundwater within the project area is not a homogeneous flow pattern. Are there preferential flow patterns? This is further support for the request by the EPA of doing a groundwater transport model. We need to know that our residents drinking water is safe. We the Directors of GCGCD, as representatives of their groundwater protection entity, are here on their behalf.

GROUNDWATER QUALITY

There are several related water quality questions associated with the UEC application. For example, inside the aquifer exemption area, what was the true water quality before exploration activity and drilling of the water sampling wells? What are the real baseline values that should apply to

restoration? As TCEQ acknowledged, no previous uranium mining operation has completely restored water to baseline values. Can this groundwater supply be prohibited from use indefinitely?

Of the 18 residences and 1 church noted in the first segment, GCGCD has been testing water quality of 4 of the residences and the 1 church for five years, see attachment 1. The constituents for the individual wells have shown good water quality with very little variability. However these wells are at risk if the permit is granted prior to a proper demonstration that these wells will not be impacted.

Referring to attachments 2a and 2b, these are the test results for the baseline and pump test wells located inside the aquifer exemption area. The first samples were taken in April 2008, the second in July 2009, and the third in November 2009. The first samples were taken shortly after the wells were completed with air jetting (i.e. introduction of air with 21 percent oxygen into the well subsurface) and exploration borehole drilling was in progress. Please note that the uranium values were the highest in the first set of samples and 18 months later the uranium values drastically dropped and were within drinking water standards. What happened to cause this large variability of uranium content? The samples were taken within the exemption area that contains high concentrations of uranium ore. Much of the exemption area was not tested so water quality in much of the aquifer exemption area is unknown.

MODELING

Daniel B. Stephens & Associates provided expert hydrology testimony for GCGCD during the contested case hearing and had previously modeled a typical five spot uranium injection/extraction operation water flow diagram, attachment 3. GCGCD has contacted Daniel B. Stephens in reference to the modeling proposed by the EPA. They have provided a proposal to do an initial cost-effective analysis. This analysis will use currently available information concerning hydraulic gradient, hydraulic conductivity and effective porosity for the purpose of calculating straight line travel time migration values from the aquifer exemption area to the area water wells. This study will cost approximately $9,000. GCGCD will consider providing this study if it is requested and will be used.

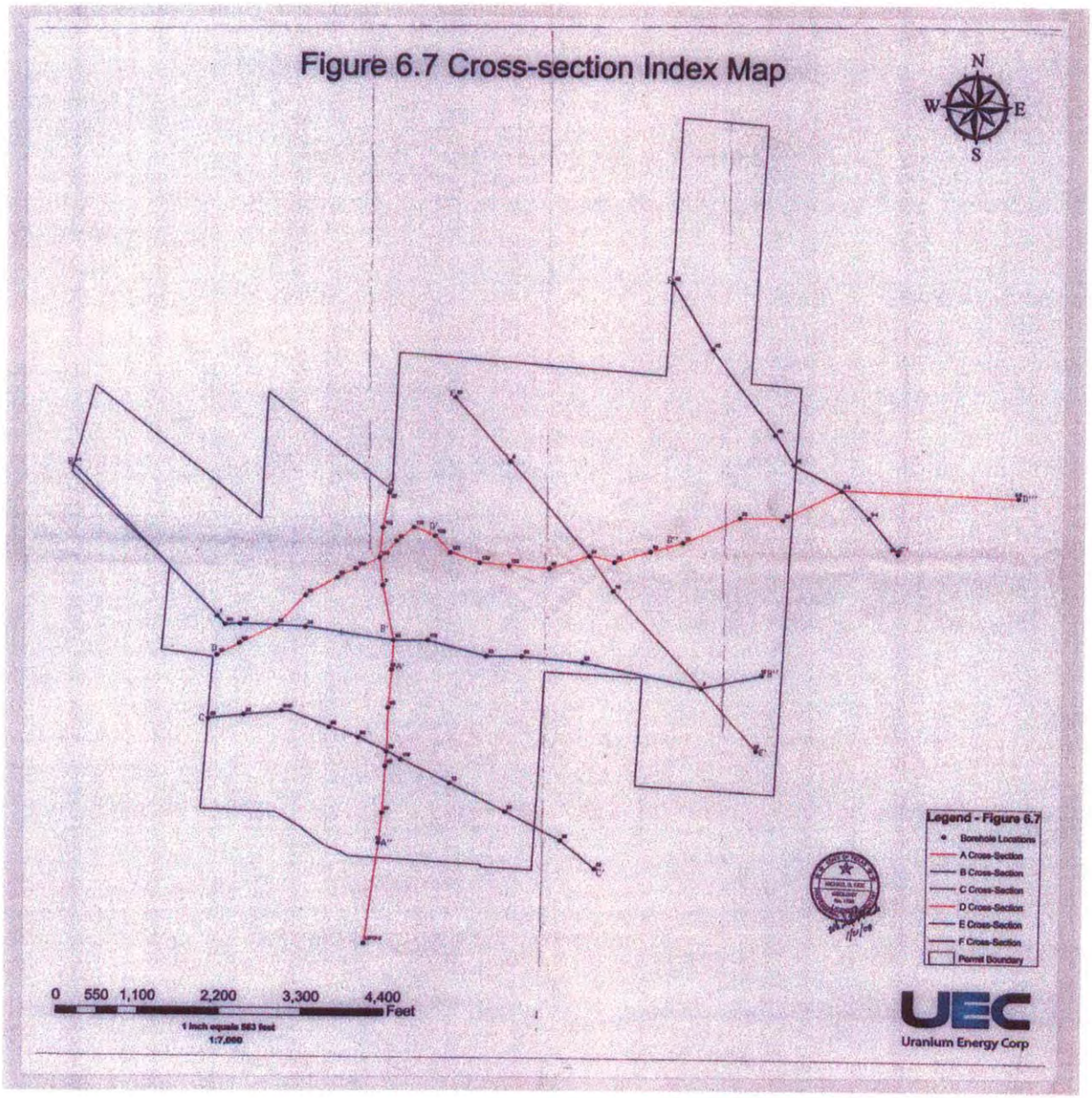
GROUNDWATER TRANSPORT

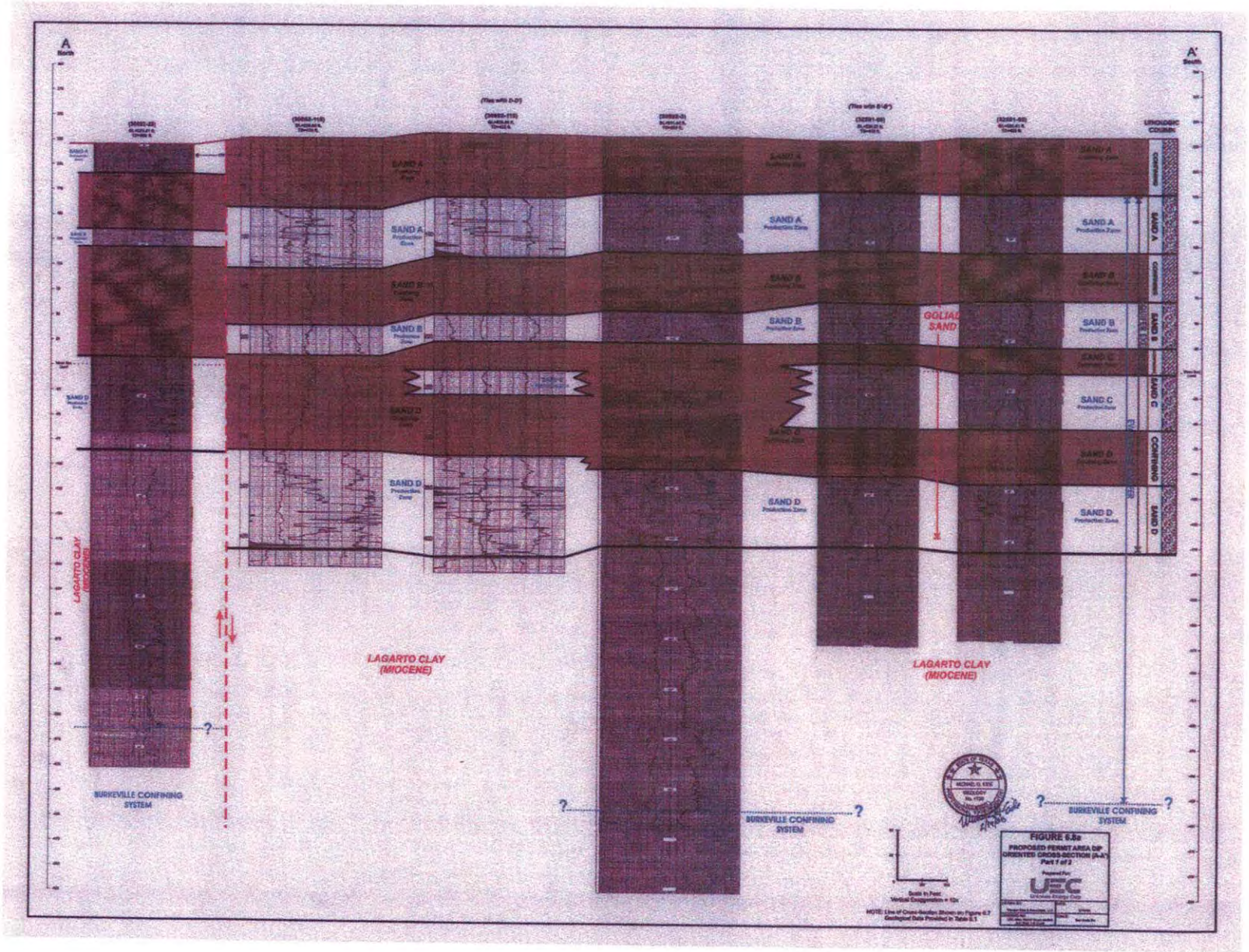
Finally, there is a crucial groundwater transport issue that was discussed during the contested case hearing that can not be ignored. A scenario was described where a landowner, located outside the permit area, might approach GCGCD for a permit to install a high volume well such as an irrigation well. Abiding by the production limits set by the District and using the groundwater for a beneficial use, this potential would be issued. The modeler for UEC was asked about this hypothetical situation and he replied that "I would definitely not like to have pumping right in the near vicinity of my baseline monitoring wells". The discussion was about a hypothetical situation but there are a number of existing domestic and livestock groundwater supply wells that currently pump in the near vicinity of the permit boundary that need to be fully integrated into the EPA's requested transport model.

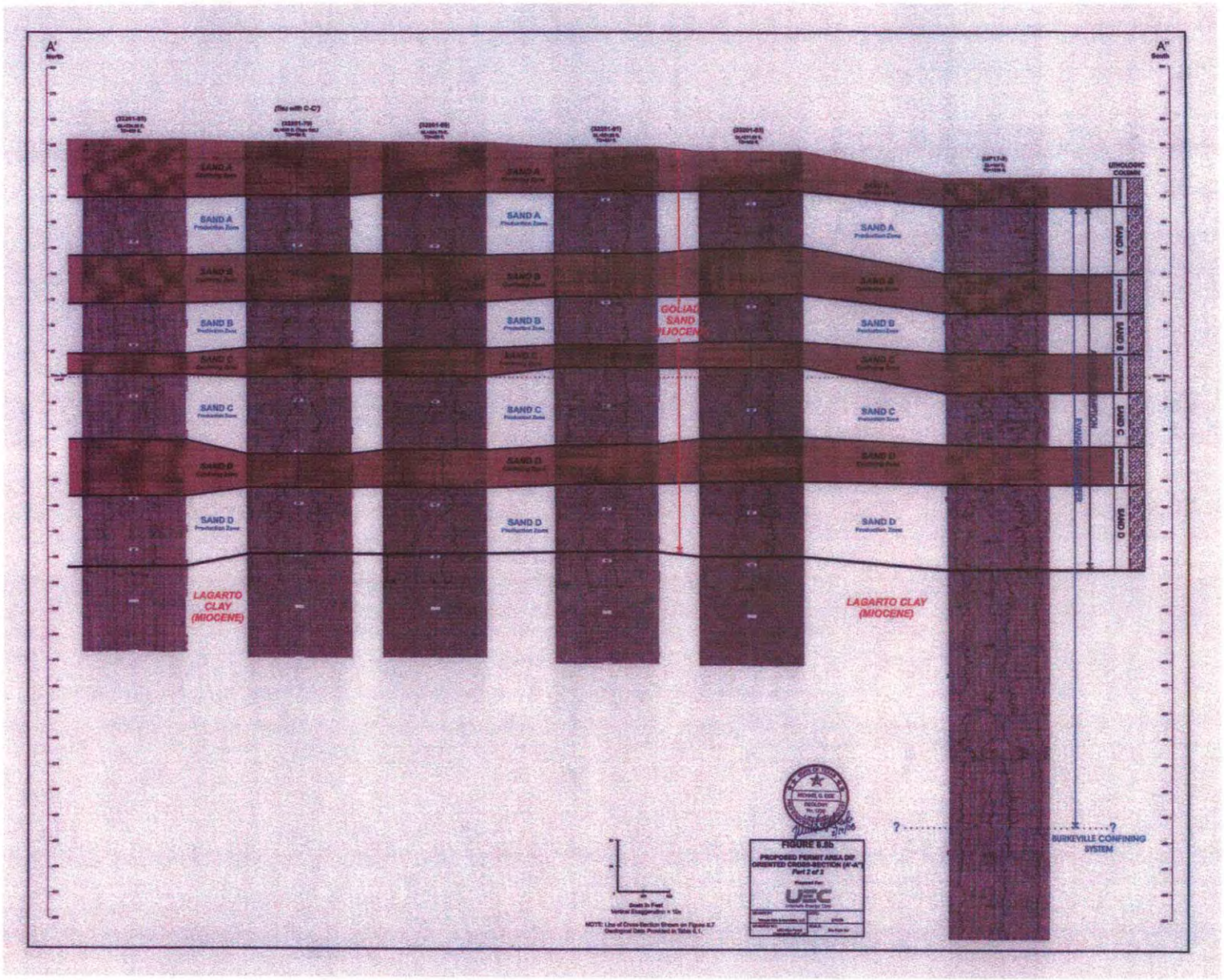
We are here to answer any questions and to offer our services, and again, we truly appreciate the opportunity to meet with you on this very important matter to our community.

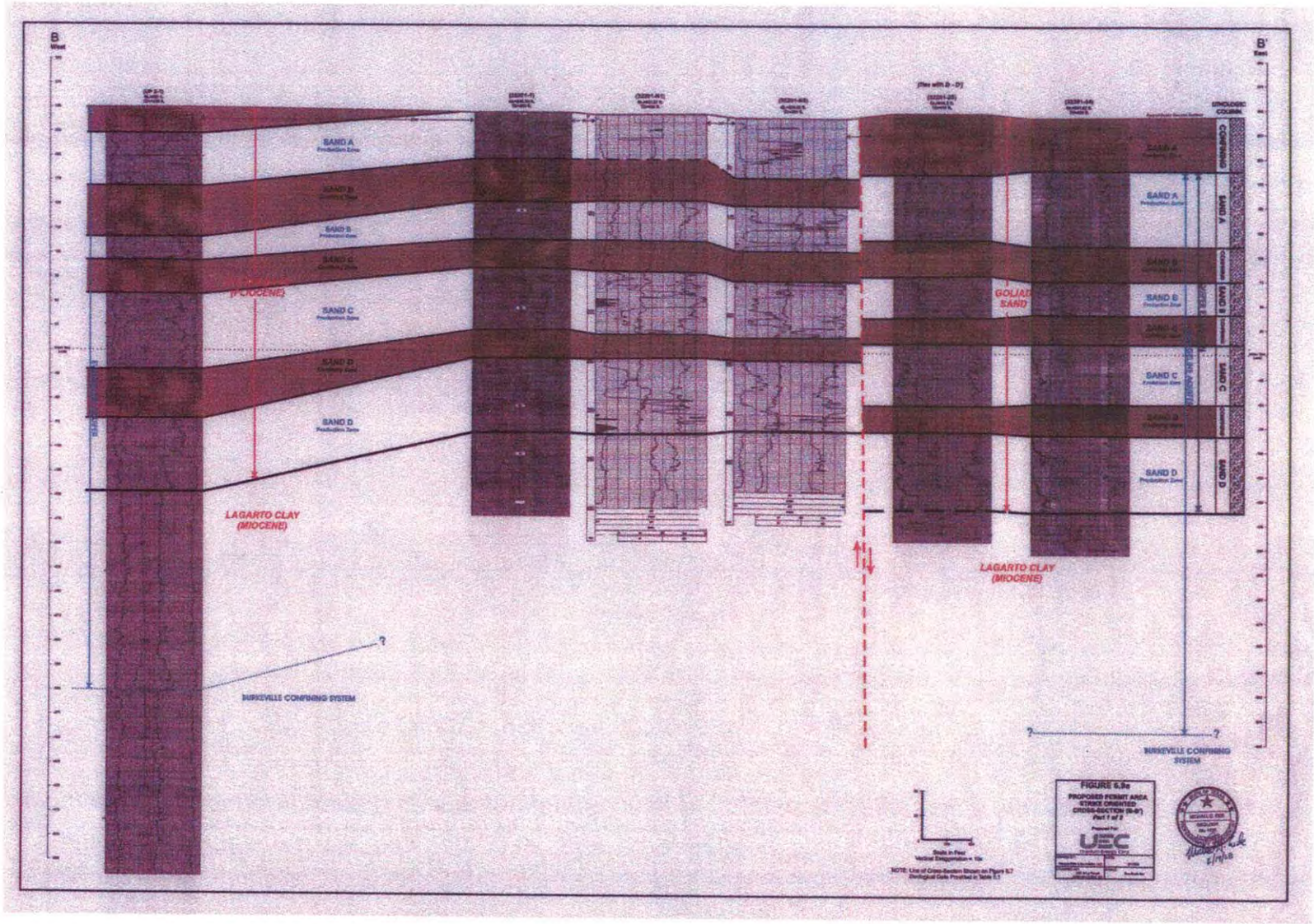
Board of Directors
Goliad County Groundwater Conservation District

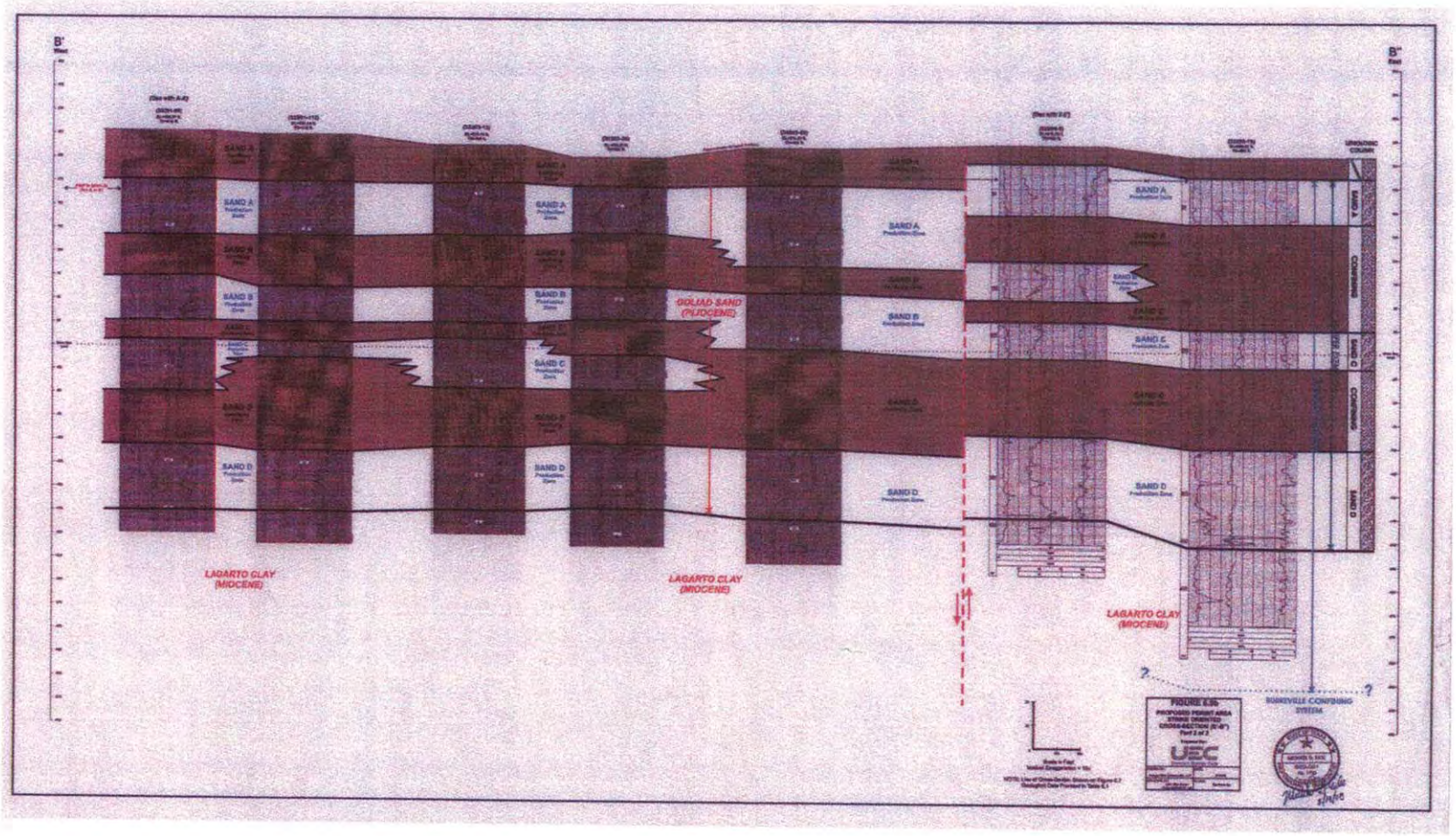
Figure 6.7 Cross-section Index Map



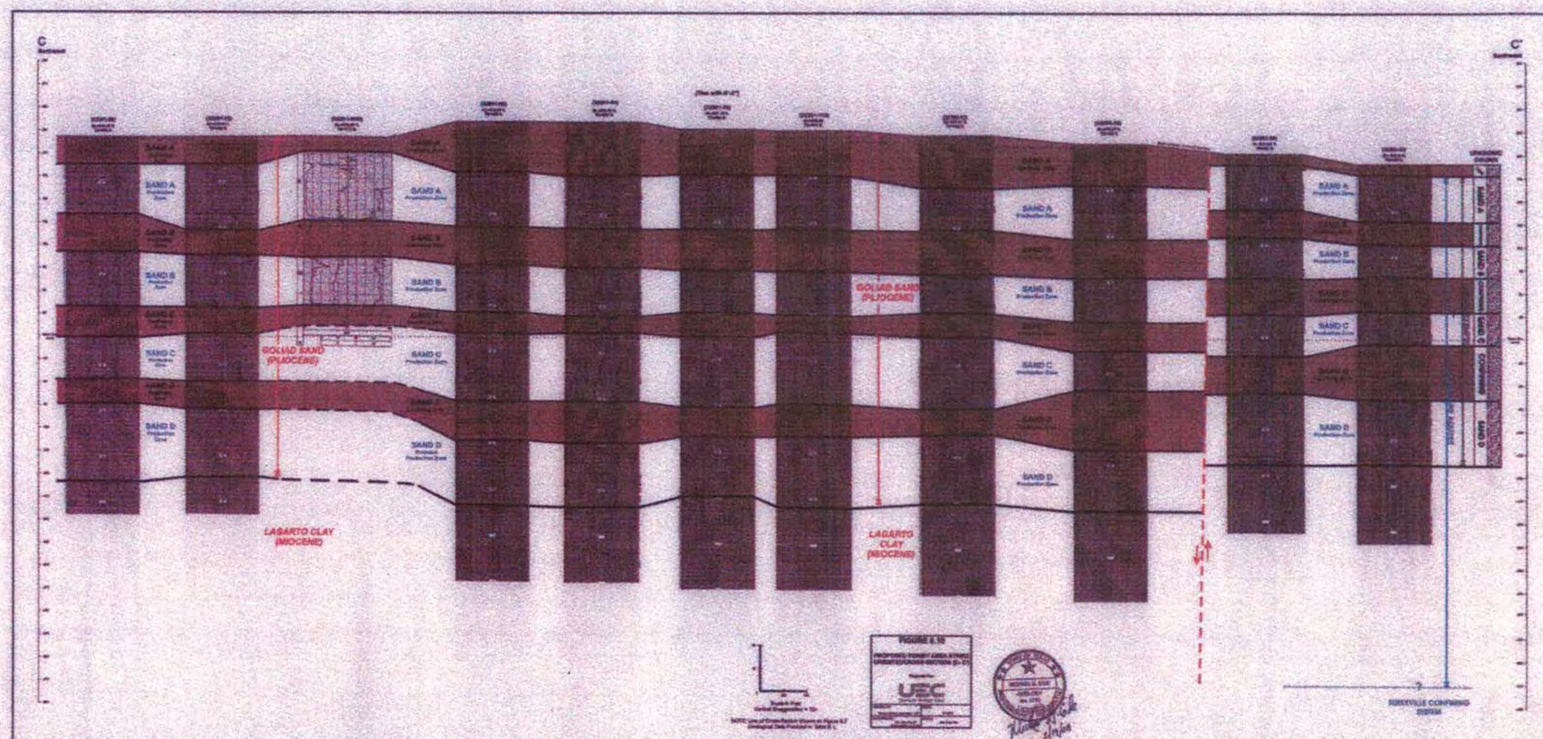

A
North
A'
South
SAND A
SAND B
SAND C
SAND D
CONFINING
GOLIAD SAND
LAGARTO CLAY (MIOCENE)
BURKEVILLE CONFINING SYSTEM
FIGURE 6.8a
PROPOSED PERMIT AREA DIP ORIENTED CROSS-SECTION (A-A')
Part 1 of 2

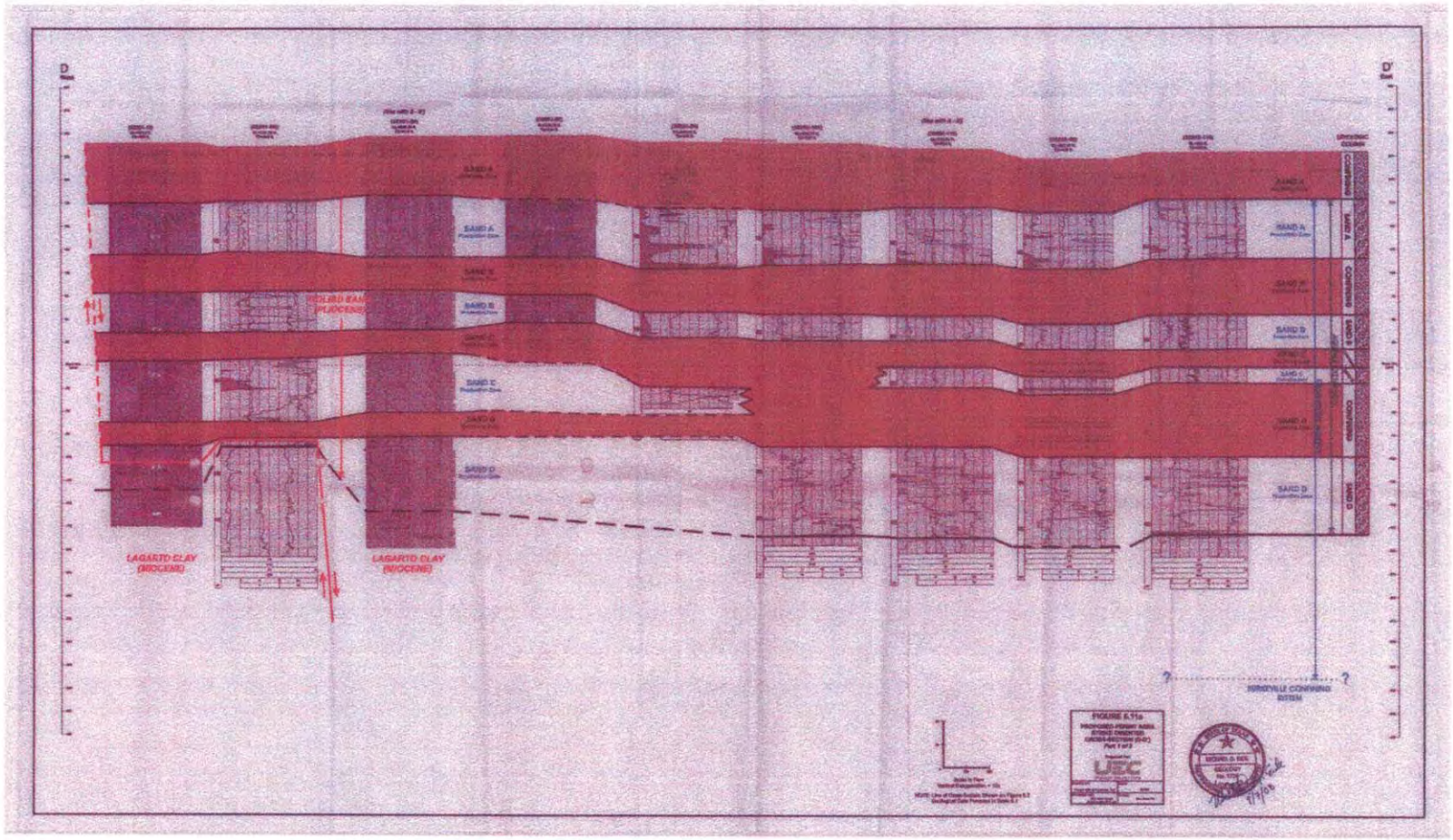

A'
North
A''
South
(Tie with C-C')
SAND A
Confining Zone
SAND A
Production Zone
SAND B
Confining Zone
SAND B
Production Zone
SAND C
Confining Zone
SAND C
Production Zone
SAND D
Confining Zone
SAND D
Production Zone
GOLIAD SAND (PLIOCENE)
LAGARTO CLAY (MIOCENE)
LITHOLOGIC COLUMN
SAND A
SAND B
SAND C
SAND D
BURKEVILLE CONFINING SYSTEM
Scale in Feet
Vertical Exaggeration = 10x
NOTE: Line of Cross-Section Shown on Figure 6.7
Geological Data Provided in Table 6.1.
FIGURE 6.8b
PROPOSED PERMIT AREA DIP ORIENTED CROSS-SECTION (A'-A'')
Part 2 of 2
Prepared for:
UEC
Uranium Energy Corp.


B
West
B'
East
SAND A
SAND B
SAND C
SAND D
LAGARTO CLAY
(MIOCENE)
GOLIAD
SAND
BURKEVILLE CONFINING SYSTEM
FIGURE 6.9e
PROPOSED PERMIT AREA
STRIKE ORIENTED
CROSS-SECTION (B-B')
Part 1 of 2
UEC

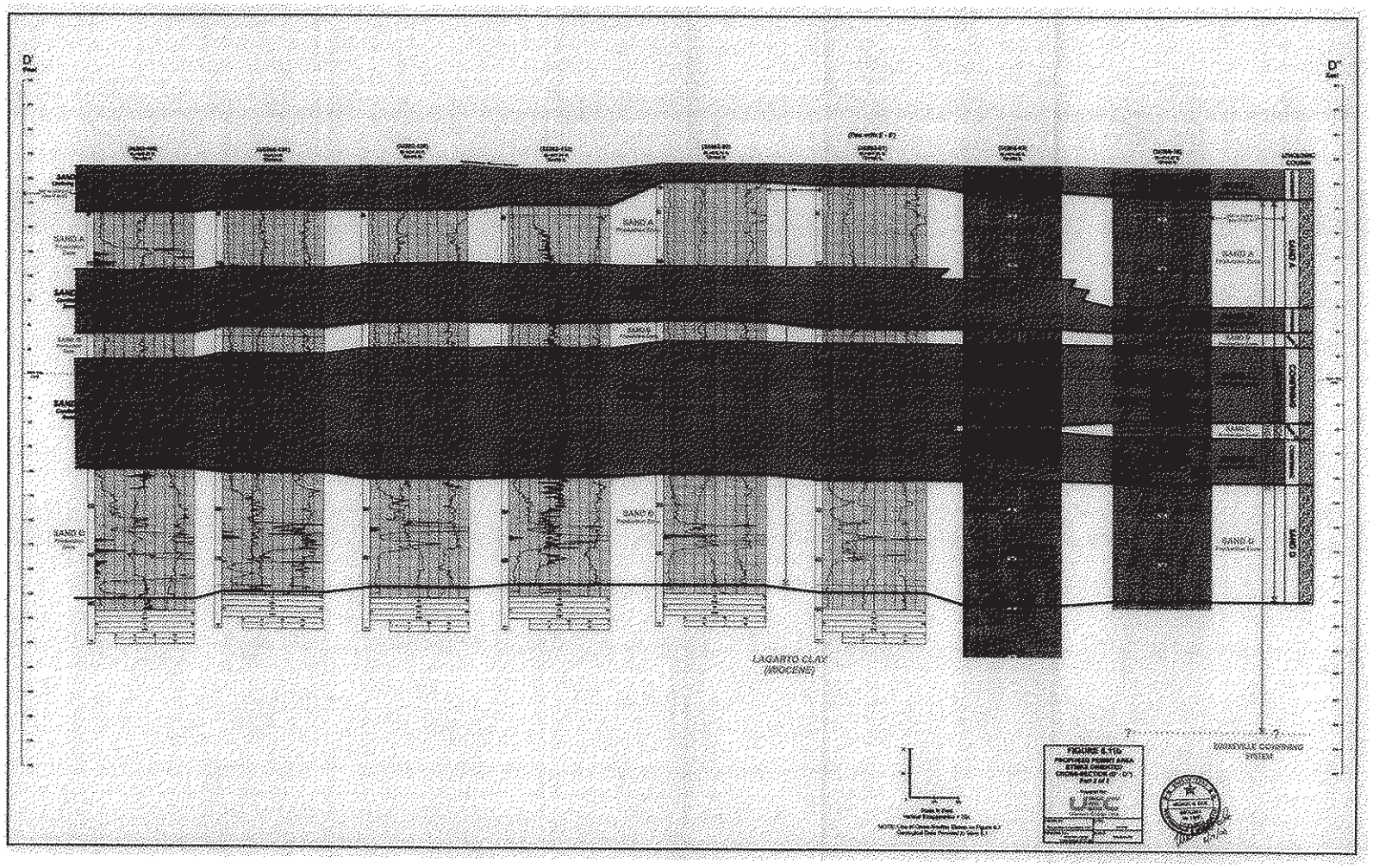


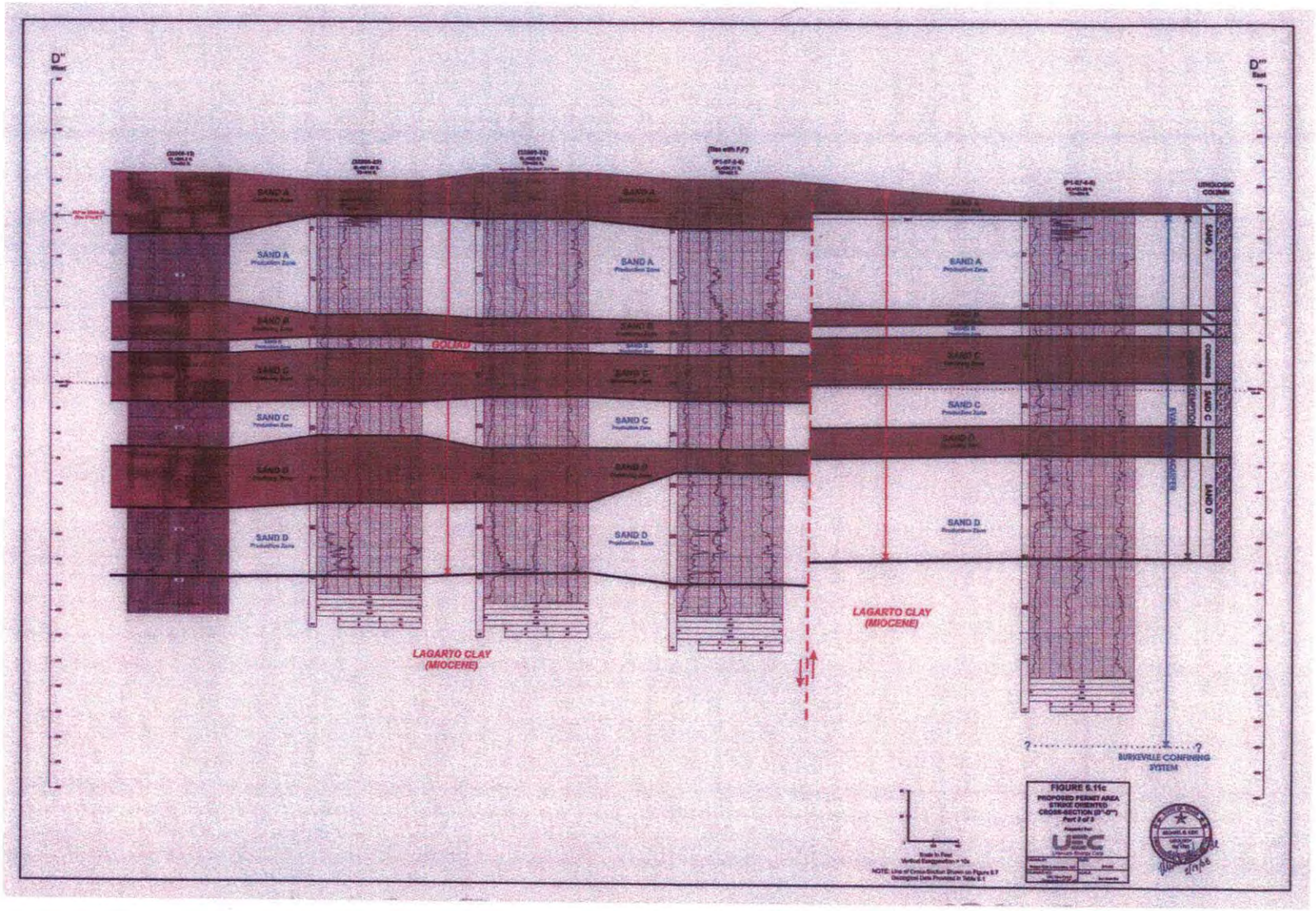
B'
B''
SAND A
SAND B
SAND C
SAND D
GOLIAD SAND (PLIOCENE)
LAGARTO CLAY (MIOCENE)
LAGARTO CLAY (MIOCENE)
LAGARTO CLAY (MIOCENE)
UNIQUE COUNTY
SAND A
CONFINING
SAND C
CONFINING
SAND D
BOSKEVILLE CONFINING SYSTEM
UEC

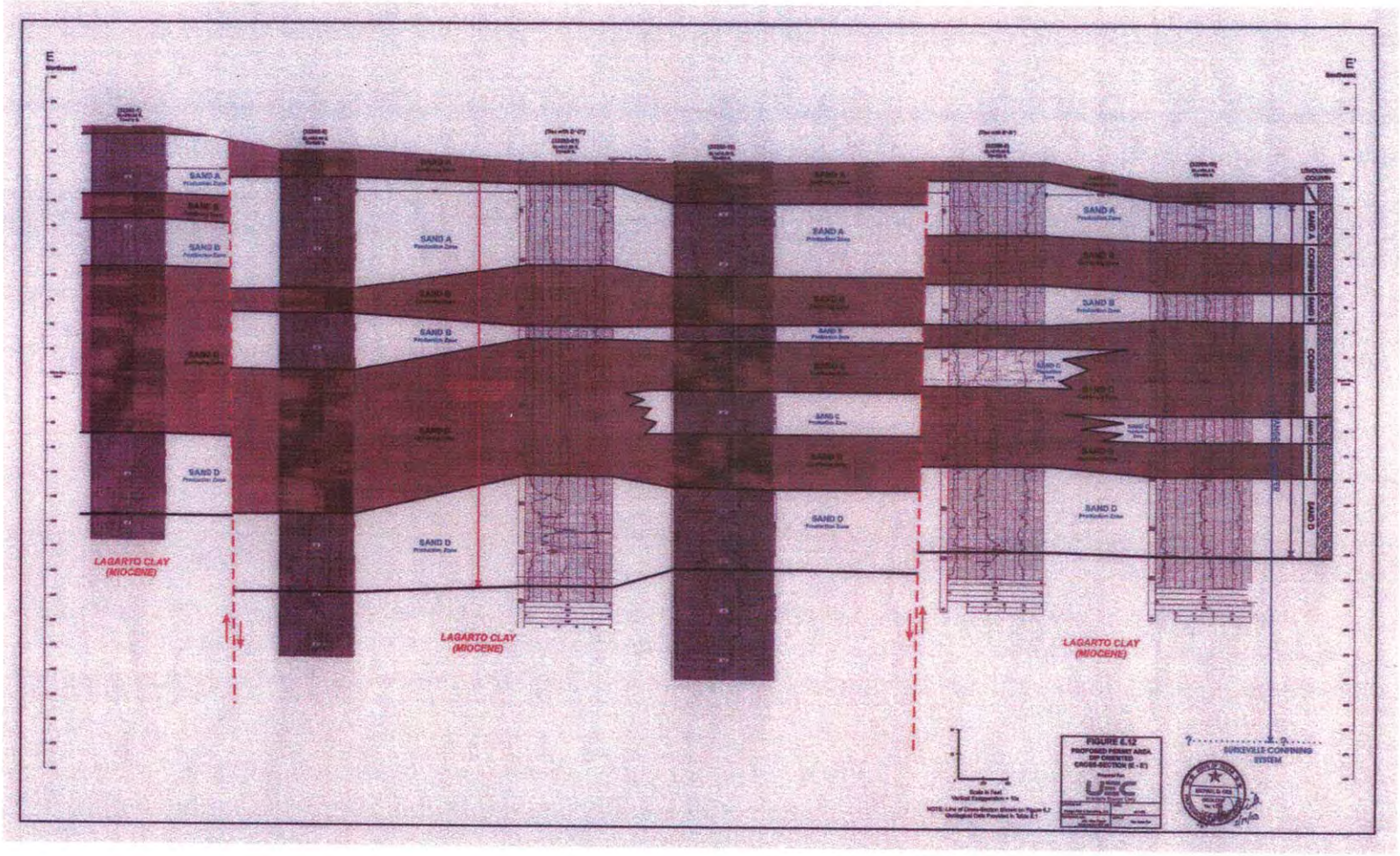

C
C'
SAND A
SAND B
SAND C
SAND D
GOLIAD SAND
(PLIOCENE)
LAGARTO CLAY
(MIOCENE)
LAGARTO
CLAY
(MIOCENE)
UEC

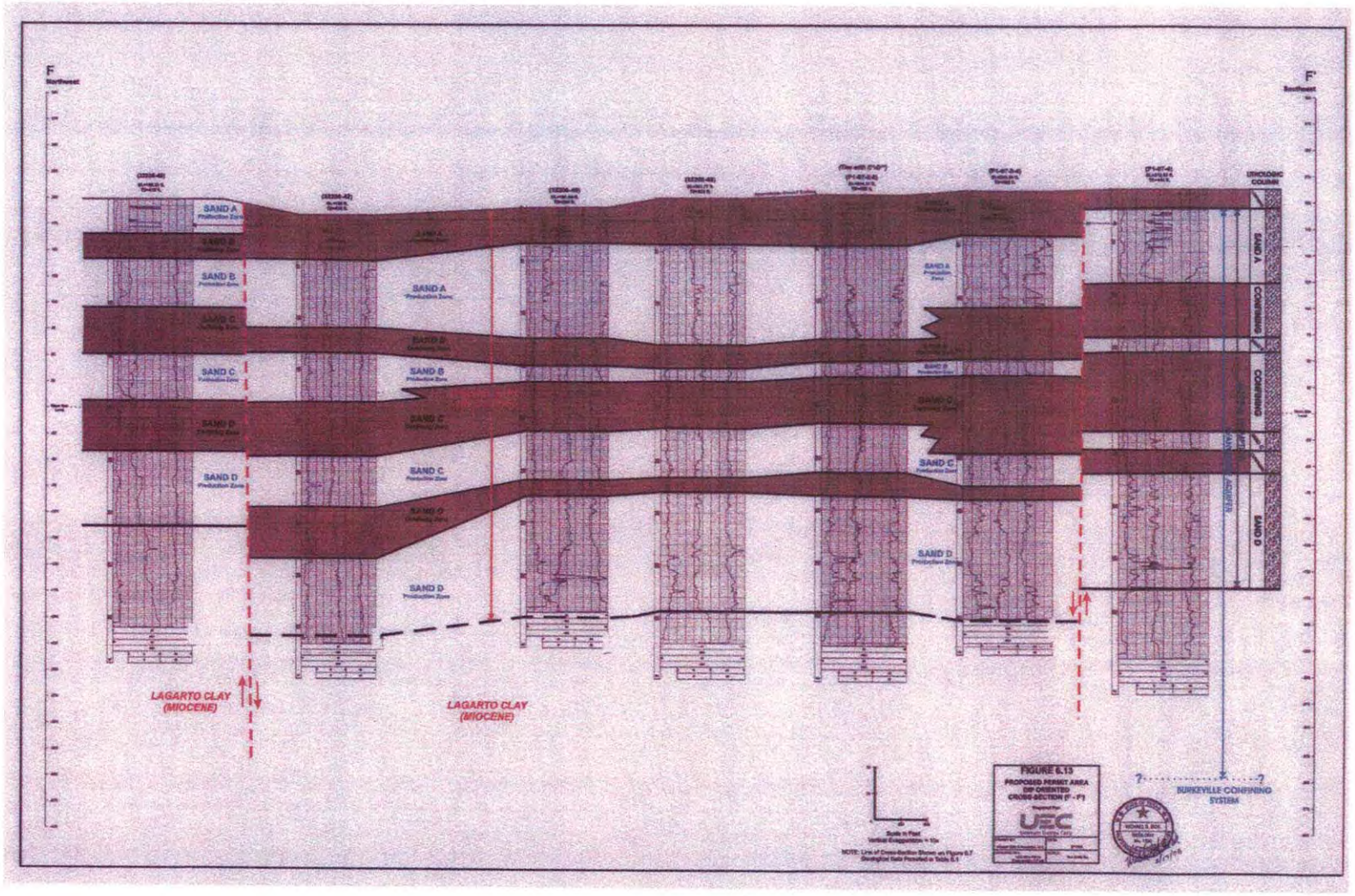


D
D'
SAND A
SAND B
SAND C
SAND D
LAGARTO CLAY (MIOCENE)
LAGARTO CLAY (MIOCENE)
CONFINING
SAND A
CONFINING
SAND B
CONFINING
SAND D


D'
D''
SAND A
SAND C
SAND D
LAGARTO CLAY
(MIOCENE)
BARKSVILLE CONFINING
SYSTEM
FIGURE 6.11b
PROPOSED PERMIT AREA
STRUCTURE
CROSS-SECTION D' - D''
UEC


D''
West
D'''
East
SAND A
SAND B
SAND C
SAND D
GOLIAD
LAGARTO CLAY
(MIOCENE)
LAGARTO CLAY
(MIOCENE)
UTHOLOGIC COLUMN
SAND A
CONFINING
SAND C
SAND D
EXEMPTION
BURKEVILLE CONFINING SYSTEM
FIGURE 6.11c
PROPOSED PERMIT AREA
STRIKE ORIENTED
CROSS-SECTION (D''-D''')
Part 2 of 3
USC
Uranium Energy Corp
Scale in Feet
Vertical Exaggeration = 10x
NOTE: Line of Cross-Section Shown on Figure 6.7
Geological Data Provided in Table 6.1


E
E'
SAND A
SAND B
SAND C
SAND D
LAGARTO CLAY
(MIOCENE)
LAGARTO CLAY
(MIOCENE)
LAGARTO CLAY
(MIOCENE)
SURKEVILLE CONFINING
SYSTEM
FIGURE 6.12
PROPOSED PERMIT AREA
DIP ORIENTED
CROSS-SECTION (E - E')


F
Northwest
F'
Southeast
LITHOLOGIC COLUMN
SAND A
Production Zone
SAND B
Production Zone
SAND C
Production Zone
SAND D
Production Zone
SAND A
CONFINING
SAND B
CONFINING
SAND C
SAND D
LAGARTO CLAY
(MIOCENE)
LAGARTO CLAY
(MIOCENE)
BURKEVILLE CONFINING
SYSTEM
FIGURE 6.13
PROPOSED FERSIT AREA
DIP-ORIENTED
CROSS-SECTION (F - F')
UEC

GROUNDWATER QUALITY

Name	Grid #	Well Location:
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	House Water Fill
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Anklam, T	14	28 52.577N 97 2
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	28 51.818N 97
Bluntzer, O	14	585 Bluntzer Ro
Duderstadt, C.	14	28 52.53N 97 21
Duderstadt, C.	14	28 52.53N 97 21
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2
Duderstadt, C.	14	28 52.528N 97 2

Test	Radium	RBLB 1,3,4,5 (PCi/l)	PTW 1-6 (PCi/l)	PTW 7-14 (PCi/l)	ALL WELLS (PCi/l)
First Test	Average	408	138	475	334
	High	1091	357	1684	1684
	Low	37	17	10	10
	Stand. Dev.	480	138	561	426
Second Test	Average	627	185	537	421
	High	1210	549	2000	2000
	Low	87	17	65	17
	Stand. Dev.	477	205	653	491
Third Test	Average	692	227	465	419
	High	1500	830	1590	1590
	Low	85	10	63	10
	Stand. Dev.	597	314	509	468

Test	Uranium	RBLB 1,3,4,5 (mg/l)	PTW 1-6 (mg/l)	PTW 7-14 (mg/l)	ALL WELLS (mg/l)
First Test	Average	0.052	0.021	0.218	0.115
	High	0.080	0.059	0.804	0.804
	Low	0.006	0.009	0.099	0.006
	Stand. Dev.	0.032	0.021	0.239	0.181
Second Test	Average	0.057	0.024	0.020	0.029
	High	0.150	0.090	0.019	0.150
	Low	0.004	0.003	0.005	0.003
	Stand. Dev.	0.069	0.034	0.021	0.040
Third Test	Average	0.007	0.003	0.005	0.005
	High	0.013	0.004	0.010	0.013
	Low	0.003	0.003	0.003	0.003
	Stand. Dev.	0.004	0.003	0.003	0.003

DRAFT Scope of Work
Source of Drinking Water Analysis for UEC Mine Site
Goliad County Groundwater Conservation District (GCGCD)
June 13, 2012

This proposed scope of work is presented to provide an initial, cost-effective analysis of the source of drinking water to wells downgradient of the UEC proposed mine site based on commentary outlined in the U.S. EPA letter dated May 16, 2012. In the referenced letter, the EPA discusses modeling approaches to determine whether a water supply well (or wells) will be affected by the proposed aquifer exemption. With regard to time-frame over which "the source of water" question is to be considered, a 75-year well life is suggested by EPA. Presumably UEC will develop a groundwater model or modify an existing model to address EPA's concerns regarding the proposed aquifer exemption. It would be useful for the GCGCD to have an idea of the number of wells that likely rely on the aquifer with the proposed exemption area as a "source of groundwater" according to EPA's outlined approach. To achieve this goal, the following scope of work is proposed.

1. Obtain from the GCGCD the following information (to the extent it is available) for all wells within one mile (or some other distance as agreed to) of the downgradient boundary of the proposed aquifer exemption area.
    a. Location
    b. Depth and screened interval
    c. Use
    d. Completion date
2. Collect and summarize readily available information concerning hydraulic gradient, hydraulic conductivity and effective porosity of the Evangeline aquifer.
3. Conduct travel time calculations based on the assumed 75-year well life and likely aquifer hydraulic properties to determine wells that have a source of groundwater within the proposed aquifer exemption boundary.
4. Provide a brief report documenting the analysis.

Daniel B. Stephens & Associates, Inc.

Cost Estimate

Client Name: GCGCD
Project Name: Source Water Analysis
Project Number:
Terms:

Date: June 13, 2012
Estimator: Neil Blandford
Project Manager:
Prepared by:
Approved by:

Task 1 **Data Collection and Analysis**

SERVICES	UNIT	UNIT FEE	QUANTITY	COST
Principal	Hour	$ 199.00		$
Senior technical specialist	Hour	183.00	20	3,660.00
Technical specialist	Hour	168.00		
Senior engineer/scientist II	Hour	147.00		
Senior engineer/scientist I	Hour	136.00		
Project engineer/scientist	Hour	117.00		
Staff engineer/scientist III	Hour	112.00	24	2,688.00
Staff engineer/scientist II	Hour	102.00		
Staff engineer/scientist I/Sr. lab technician	Hour	91.00		
Field/laboratory technician	Hour	78.00		
Senior graphics designer	Hour	100.00		
Senior CAD technician	Hour	91.00		
GIS analyst/database analyst	Hour	101.00		
GIS/IS technician	Hour	84.00	32	2,688.00
Senior technical editor	Hour	93.00		
Technical editor	Hour	81.00		
Project assistant	Hour	76.00		
Assistant/professional	Hour	67.00		
Assistant technician	Hour	57.00		
		Subtotal:	**76**	**$ 9,036.00**

EXPENSES	MARKUP	UNIT	UNIT FEE	QUANTITY	COST
			$		$
			Subtotal:		**$ 0.00**

Total Direct Cost	**9,036.00**
Markup on third party services	0.00
TASK 1 TOTAL	**$ 9,036.00**

NOTES:

DRAFT