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*Delivered Electronically via IHWPER@tceq.texas.gov*

December 1, 2025

Texas Commission on Environmental Quality  
Industrial and Hazardous Waste Permits Section - MC-130  
12100 Park 35 Circle  
Austin, TX 78753

RE: Response to TCEQ NOD 3 Addendum – CCR105  
Luminant Generation Company LLC – Tatum, Rusk County  
Industrial Solid Waste Registration No. 31277  
EPA Identification No. TXD000821306  
Tracking No. 27220868; RN102583093/CN603256413

Luminant Generation Company LLC has prepared written responses for the deficiencies identified in the "Addendum to 3<sup>rd</sup> NOD - New Registration – Luminant Generation Company LLC Registration - No. CCR105" received via email from TCEQ on October 1, 2025. The written responses are in Table 1 and the attached technical memorandum.

If you have any questions or require any additional information, please contact Eric Chavers at 903-389-6062 or by e-mail at [eric.chavers@luminant.com](mailto:eric.chavers@luminant.com).

Sincerely,

A handwritten signature in blue ink, appearing to read "Renee Collins", is written over a light blue horizontal line.

Renee Collins

Attachments: Technical Memorandum "Response to TCEQ NOD 3 Addendum – CCR  
Registration No. CCR105"

cc with attachments:

Pradeep Patel (Pradeep.patel@tceq.texas.gov)  
Daniella Ortiz de Montellano (daniela.ortiz-demontellano@tceq.texas.gov)

Table 1 - NOD Summary and Response  
Registration No. CCR105 - Luminant Generation Company LLC  
Application Deficiencies - Addendum to NOD 3

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                                                                                                                                             | Citation                             | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1               | VI           | VI.27. B         | [Appendix F<br>2022 Groundwater Monitoring<br>System Certification<br>Addendum No. 1<br>A1 Landfill Area]<br>(.pdf pgs. 11-14)                                                                                                                                    | 40 CFR §257.94<br>30 TAC §352.911    | Provide North-South and East-West geological cross sections across the landfill down to the bedrock and beyond the boundary of the mine spoils showing the local subsurface geology in the vicinity of the landfill along with the projected nearest wells to the cross sections. Also, provide the maximum and minimum historical groundwater levels on the monitoring wells in the cross sections.                                                                                    | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 1 Response and requested A1 Area Landfill cross sections in Technical Memorandum Attachment 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2               | VI           | VI.27.D          | Appendix F<br>2024 Annual Groundwater and<br>Corrective Action Report<br>A-1 Area Landfill January 31, 2025<br>(.pdf pgs. 267-269)<br>[2017 CCR Rule Groundwater<br>Monitoring System Certification<br>MLSES-A1 Landfill<br>October 16, 2017]<br>(pdf pgs. 42-51) | 40 CFR §257.91(c)<br>30 TAC §352.911 | A1 Landfill: Provide a narrative, with site-specific technical information, on the method that was used to determine the well spacing of the landfill groundwater monitoring system and how the monitoring system can capture all potential contaminant pathways from the landfill. For example, explain how potential contaminants can be captured in the area where the potentiometric surface map indicates a groundwater flow direction towards the south and west of the facility. | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 2 Response.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3               |              |                  | EPA Notice Letter - RCRA<br>February 4, 2025                                                                                                                                                                                                                      | 40 CFR §257.107(h)(7)                | A1 Landfill:<br>Post on the public website the '2019-Martin Lake-SWR 31277-Corrective Measures Assessment ML Landfill.pdf' on the 2019 Martin Lake CCR website (as has been done for the Ash Pond Area).                                                                                                                                                                                                                                                                                | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 2 Response.<br><br>An Assessment of Corrective Measures (ACM) was initiated on April 8, 2019. At that time, the notification that an ACM has been initiated required at 40 CFR §257.107(h)(7) was only for unlined surface impoundments as stated in 40 CFR §257.95(g)(5). As part of the "Part A: Deadline to Initiate Closure" update published on August 8, 2020, 40 CFR §257.95(g)(5) was updated to remove the specificity only requiring the notification for unlined surface impoundments thus indicating that the notification is required for all units. There was not a posting requirement for landfills at the time this ACM was initiated. |

|   |    |         |                                                                                                                                                                                                                                          |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                            |
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| 4 | VI | VI.27   | EPA Notice Letter - RCRA<br>February 4, 2025<br>[Appendix F<br>Coal Combustion Residual Rule<br>Background Groundwater<br>Monitoring and Statistical Analysis<br>Summary Report<br>(.pdf pg. 511)<br>A1 Area Landfill] February 26, 2024 | 40 CFR §257.91(a)<br>40 CFR §257.91(c) | A1 Landfill:<br>Provide a site-specific technical justification explaining the use of well BMW-11A-R as the background well for the A1 Area Landfill CCR Unit. For example:<br>Provide additional 'background' groundwater quality for comparison, or<br>Provide additional discussion on alternative statistical methods used to address the EPA comment from the Notice Letter dated Feb. 4, 2025. Section 2.4 (.pdf p. 511) and Appendix C (.pdf pages 1498-1506) of the CCRRBGMandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the interwell statistical method, which uses the background well groundwater quality, and therefore, the 'background nature' of well BMW-11A-R comes into question.                                                                                                                    | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 4 Response.                                                                                                            |
| 5 | VI | VI.27   | EPA Notice Letter - RCRA<br>February 4, 2025                                                                                                                                                                                             | 40 CFR §257.91(a)<br>40 CFR §257.91(c) | PDP5:<br>Please provide a narrative that addresses the fact there is no true background well because of groundwater mounding and radial groundwater flow centered on well MW-18A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 5 Response and PDP-5 potentiometric surface maps in Technical Memorandum Attachment 3.                                 |
| 6 | VI | VI.27   | CCR Rule Background GW<br>Monitoring and Statistical Analysis<br>Summary Report February 26, 2024<br>(.pdf pg. 2275)<br>EPA Notice Letter - RCRA<br>February 4, 2025                                                                     | 40 CFR §257.93(h)(1)                   | PDP-5 Area:<br>Provide additional narrative explaining the use of intrawell data evaluation statistical analysis method used in Surface Impoundment PDP 5, groundwater monitoring systems at the Martin Lake CCR Unit.<br>Section 2.4 (.pdf p. 2275) and Appendix C (.pdf pages 2997-3006) of the CCRRBGMandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the intrawell statistical method.                                                                                                                                                                                                                                                                                                                                                                                                                                | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 6 Response.                                                                                                            |
| 7 | VI | VI.27.B | [Appendix F,<br>GWM System Certification –<br>Addendum No. 1 PDP-5<br>December 2022,<br>Figures 3 and 4<br>PDP 5]<br>(pdf pgs. 9-10)                                                                                                     | 40 CFR §257.94                         | Update the geological cross sections across the PDP-5 Surface Impoundment (and the closed PDPs-1, 2 and 3) (A-A' and B-B') to include other nearby wells to extend the subsurface geology beyond the unit boundary. Also include the historical highest and lowest groundwater levels at each additional well added to the cross section.<br>PDP 5: Provide a narrative explaining the groundwater table elevations that occur above the base of the closed units, within the closed middle portion of PDP 1, 2, and 3. The PDP-5 Addendum 1 includes two cross sections across the PDP 5 Impoundment (A-A' and B-B'). The cross sections include historical maximum and minimum groundwater elevations on wells MW-20A and MW-18A on A-A' and wells PDP-25 and MW-19 on B-B.' The groundwater table elevations occur above the base of closed units: PDP-1, PDP-2, and PDP-3. | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 7 Response and updated PDP-5 cross sections in Technical Memorandum Attachment 4 and closure approval in Attachment 5. |

|    |    |         |                                                                                                                                                      |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                |
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| 8  | VI | VI.28   | Coal Combustion Residual Rule 2024<br>Annual Groundwater and Corrective<br>Action Report<br>Attachment 1<br>January 31, 2025<br>(pdf pgs. 42-43)     | 40 CFR §257.94                    | PDP-5 Area:<br>Provide a narrative explaining the historical variation of the potentiometric contours including the radial groundwater flow direction in the PDP-5 Area. Use all of the wells in the groundwater monitoring system and any non-CCR wells available in the surrounding areas for construction of the potentiometric surface contours or explain why those wells are excluded. (The initial maps in 2017 and map year October 4, 2021, shows four flow directions (radial) and map year 2024 shows 2 flow directions). Overall, the facility shows radial flow. Provide a groundwater monitoring system that has a sufficient number of wells and a well spacing adequate to monitor any downward and/or lateral movement of potential contaminants in all directions due to radial flow, see comment 3 above.                                                                         | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 8 Response.                                                                                                |
| 9  | VI | VI.29   | Alternate Source Demonstration<br>2024<br>MLSES - PDP 5<br>March 8, 2024<br>(pdf pg. 3)                                                              | 40 CFR §257.94(e)                 | Provide additional water quality data from nearby wells or previous studies that indicate similar concentrations for SSI constituents to support the natural-source explanation within the ASD.<br>Provide the location of the ASD-referenced sampled wells (distance and direction) in the Sabine uplift area in Texas, as cited in Texas Bureau of Economic Geology report (1991) as stated in the ASD submission.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 9 Response and Texas Bureau of Economic Geology report data summary in Technical Memorandum Attachment 6.. |
| 10 | VI | VI.27.B | [Appendix F<br>Coal Combustion Residual Rule<br>Groundwater Monitoring System<br>Certification MLSES - Ash Pond<br>October 16, 2017]<br>(pdf pg. 21) | 40 CFR §257.91<br>30 TAC §352.911 | Update the (C-C') Cross Section in Appendix F - Ash Pond with the historical maximum and minimum groundwater levels and trace the bottom of the three Ash Pond Units on the cross section (as in CCR Assessment of Corrective Measures Report, September 2019, pdf pg. 37) showing the geological formations and the separation between the groundwater table and the bottom of the Ash Ponds.<br>The Groundwater Monitoring Report 2021 shows a North and Northeast (NE) groundwater flow direction, a North NE to NE direction in 2022, and a NE direction again in 2023 and 2024.<br><br>Address the following:<br>Justify the well spacing in the Ash Pond area in the down-gradient direction.<br>Justify how the present groundwater monitoring well network can detect any release of potential contaminants from the Ash Pond area based upon the existing number of wells and well spacing. | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 10 Response and updated Ash Pond Area cross sections in Technical Memorandum Attachment 7.                 |



|       |      |         |                                                                                                                                                           |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                            |
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| 11    | VI   | VI.27.B | [Appendix F<br>Coal Combustion Residual Rule<br>Groundwater Monitoring System<br>Certification MLSES - Ash Pond<br>October 16, 2017]<br>(pdf pgs. 21, 23) | 40 CFR §257.93(a)                 | Provide information on using H-26, H-27, and H-33 as background wells as the groundwater may be affected by the operations of the facility (e.g. coal piles) to the west, which is upgradient (based on applicant-supplied groundwater flow maps) to these background wells. This may be based upon:<br>Groundwater or other monitoring data to substantiate the 'background' quality of these three upgradient, background wells. Additionally, include any geotechnical analyses of the 'ML' lithologic unit that may indicate a low-flow boundary or 'isolation' of the lower sand body, in which the background wells are completed (as indicated in Cross Section C-C'), from the operations of the facility (e.g. coal piles).          | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 11 Response.                                                                                                           |
| 12    | VI   | VI.27.B | [CCR Assessment of Corrective<br>Measures Report<br>Ash Pond Area]<br>September 2019<br>(pdf pgs. 37-38)                                                  | 40 CFR §257.91<br>30 TAC §352.911 | Cross section C-C' (Groundwater Monitoring System Certification Report, October 16, 2017, pg. 21) illustrates that the Ash Pond(s) monitoring wells are completed into the lower sand lithologic unit. This sand unit is partially isolated by a clay lithologic unit in the eastern three-quarters of the Ash Pond Management Unit. Cross section C-C' from the CCR Assessment of Corrective Measures Report (September 2019) illustrates that the three surface impoundments lie, either partially or wholly, within the upper sand lithologic unit.<br>Justify how no monitoring wells were completed within the upper sand unit at least in the portions of the Ash Pond Management Unit that are underlain by the 'isolating' clay unit. | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 12 Response.                                                                                                           |
| 13    | VIII | VIII.33 | [Appendix H (Revision 2) – Financial<br>Assurance, Post- Closure Care Cost<br>Estimate<br>Tables 1, 2 & 3<br>February 27, 2024]<br>(pdf pgs. 6-8)         | 30 TAC §352.1101(b)               | Revise the post-closure cost estimates in the referenced tables to include the dollar year in which the estimates were made (i.e., 2024 dollars).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 13 Response and Post Closure Care Cost Estimates - Revision 3 located in Technical Memorandum Attachment 8.            |
| 14    | N/A  | N/A     | NOD 3 Response Letter<br>Dated 2/27/2024                                                                                                                  |                                   | In the NOD response letter, the response column refers to CCR registration No. CCR-106 numerous times; however, the Martin Lake CCR Facility is designated as CCR-105. Please revise the letter and make the necessary corrections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 14 Response and replacement pages for NOD response letter in Technical Memorandum Attachment 9.                        |
| 10(2) | VII  | VII.31  | [Appendix G<br>Closure Plan<br>Addendum 1<br>MLSES -<br>A1 Area Landfill]<br>December 2022 (.pdf pg. 80, 85)                                              | 40 CFR<br>§257.102(d)(1)(iii)     | Address in the Slope Stability Analysis Section, as required in NOD 3, dated 02/27/2024. The following issues were not fully addressed for A-1 Landfill.<br>Slope Stability Analysis Section (Section 2.4: Slope Stability – A1 Area Landfill Cap/Cover System):<br>Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).                                                                                                | Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 10(2) Response and closure plan replacement page containing requested statement in Technical Memorandum Attachment 10. |

|       |     |        |                                                                                                                                                                                                   |                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                    |
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| 12(2) | VII | VII.31 | <p>[Appendix G<br/>Closure Plan<br/>Addendum 1<br/>for A1 Area Landfill, Ash Pond Area,<br/>and PDP-5]<br/>(A1 .pdf pg. 85, 92)<br/>(Ash Pond .pdf pg. 214, 219)<br/>(PDP5 .pdf pg. 355, 359)</p> | <p>30 TAC §352.4<br/>40 CFR §257.102(b) 40<br/>CFR<br/>§257.102(d)(3)(i)(D)</p> | <p>Address in the Settlement Analysis Section (2.3 Settling and Subsidence - Cap/Cover System), as required in NOD 3, dated 02/27/2024. The following issue was not addressed in the NOD 3 response. Settlement Analysis Section:<br/>Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that site 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).</p> | <p>Please see attached Technical Memorandum "Response to TCEQ NOD 3 Addendum - CCR Registration No. CCR105", Section 1.0, NOD Item No. 12(2) Response and closure plan replacement pages containing requested statement in Technical Memorandum Attachment 10.</p> |
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[1] Deficiency ID – Key: Use this numbered ID to identify the NOD response.

[2] Location of deficiency in submittal/application. Items in square brackets [ ] refer to applicant's supplemental information submitted as attachments/appendices to the application form.



**Bullock, Bennett & Associates, LLC**

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**TECHNICAL MEMORANDUM**

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TO: Eric Chavers, Luminant Generation Company LLC

FROM: Will Vienne, Bullock, Bennett & Associates, LLC

RE: Response to TCEQ NOD 3 Addendum – CCR Registration No. CCR105  
Martin Lake Steam Electric Station - Rusk and Panola Counties, Texas  
(SWR 31277; RN102583093; CN603256413; EPA ID No. TXD000821306)

DATE: November 25, 2025

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This technical memorandum was prepared by Bullock, Bennett & Associates, LLC (BBA) on behalf of Luminant Generation Company LLC (Luminant) to respond to Texas Commission on Environmental Quality's (TCEQ's) request for additional information regarding the Coal Combustion Residuals (CCR) Program registration application for CCR units at the Martin Lake Steam Electric Station in Rusk and Panola Counties, Texas (the Site). The Martin Lake CCR units regulated under the TCEQ's CCR Program include the East Ash Pond, West Ash Pond, and New Scrubber Pond (collectively referred to as the Ash Ponds); the Permanent Disposal Pond 5 (PDP-5); and the A1 Area Landfill. The information presented in this memo addresses the TCEQ's Addendum to 3<sup>rd</sup> Notice of Deficiency (NOD) issued October 1, 2025.

**1.0 COMMENTS AND RESPONSES**

This section provides a summary of the TCEQ's technical comments and responses to those comments. A copy of the TCEQ's Addendum to the 3<sup>rd</sup> NOD letter is provided in Attachment 1.

**NOD Item No. 1**

*[A1 Landfill:] Provide North-South and East-West geological cross sections across the landfill down to the bedrock and beyond the boundary of the mine spoils showing the local subsurface geology in the vicinity of the landfill along with the projected nearest wells to the cross sections. Also, provide the maximum and minimum historical groundwater levels on the monitoring wells in the cross sections.*

**Response:** The requested A1 Area Landfill cross sections are provided in Attachment 2.

## **NOD Item No. 2**

*A1 Landfill: Provide a narrative, with site-specific technical information, on the method that was used to determine the well spacing of the landfill groundwater monitoring system and how the monitoring system can capture all potential contaminant pathways from the landfill. For example, explain how potential contaminants can be captured in the area where the potentiometric surface map indicates a groundwater flow direction towards the south and west of the facility.*

**Response:** A qualified professional engineer has certified that the CCR groundwater monitoring system at the A1 Area Landfill was designed and constructed to meet the groundwater monitoring system requirements of the *Groundwater Monitoring Systems* section [40 C.F.R § 257.91] of the CCR Rule (PBW, 2017a). The CCR Rule specifies that a CCR groundwater monitoring system must consist of a minimum of one upgradient and three downgradient wells. The A1 Area Landfill CCR groundwater monitoring system consists of twelve monitoring wells, including two upgradient wells and ten downgradient wells. The CCR monitoring wells were completed in the uppermost aquifer at approximately regular intervals around the perimeter of the CCR unit to (1) determine the direction of groundwater flow, (2) monitor upgradient groundwater conditions to establish background concentrations, and (3) monitor downgradient areas of the CCR unit so that potential releases from the unit could be detected.

The TCEQ reviewed the A1 Area Landfill monitoring well network as part of the registration package that was submitted to and approved by the TCEQ Industrial and Hazardous Waste (IHW) Program. Several monitoring wells have been replaced over time, but the current monitoring well locations are nearly identical to those that the TCEQ approved as part of the IHW registration approval. In regard to monitoring potential contaminant pathways on the south and west of the facility, there are several CCR groundwater monitoring wells located in those areas, including BMW-18, BMW-19, BMW-23, BMW-24, and BMW-28. Well BMW-28 was added to the landfill monitoring network in 2016 where a monitoring well was not present at the time, specifically to monitor groundwater near the southwest boundary of the landfill.

The current CCR groundwater monitoring well network has been effective at detecting statistically significant increases/levels (SSIs/SSLs) in downgradient wells at the A1 Area Landfill. The initial Detection Monitoring Program groundwater samples were collected from the A1 Area Landfill CCR monitoring well network in September 2017. The evaluation of those data was completed in 2018 using procedures described in the Statistical Analysis Plan (Golder, 2022a) to identify SSIs of Appendix III parameters over background concentrations. Alternate source evaluations were inconclusive for one or more of the SSIs. Consequently, an Assessment Monitoring Program was initiated and established for the A1 Area Landfill in July 2018 in accordance with 40 C.F.R. § 257.94(e)(2). Concentrations of Appendix IV constituents at SSLs above groundwater protection standards (GWPSs) were initially identified in January 2019 for arsenic, barium, cobalt, and lithium; however, cobalt is the only Appendix IV constituent that is currently observed at SSLs above the GWPS (BBA, 2025a).

An Assessment of Corrective Measures was initiated on April 8, 2019, and was completed on September 5, 2019 (Golder, 2019a), in accordance with 40 C.F.R. § 257.96 to address the Appendix IV SSLs. A public meeting was held on November 13, 2019, pursuant to 40 C.F.R. § 257.96(e), to discuss the results of the Assessment of Corrective Measures. A Remedy Selection Report (Golder, 2022b) was completed in January 2022 in accordance with the requirements of 40 C.F.R. § 257.97. Monitored natural attenuation (MNA) with source control measures was selected as the remedy to address the Appendix IV constituents observed at SSLs after a site-specific feasibility study to evaluate MNA as a potential groundwater remedy was performed in accordance with guidance and best practices promulgated by the United States Environmental Protection Agency (EPA, 2007a and 2007b) and Interstate Technology and Regulatory Council (ITRC, 2010).

In summary, the design of the A1 Area Landfill groundwater monitoring system has been effective at identifying SSIs/SSLs and satisfies the groundwater monitoring performance standard of the CCR Rule.

### **NOD Item No. 3**

*A1 Landfill: Post on the public website the '2019-Martin Lake-SWR 31277-Corrective Measures Assessment ML Landfill.pdf' on the 2019 Martin Lake CCR website (as has been done for the Ash Pond Area).*

### **Response:**

There was not a posting requirement at the time this Assessment of Corrective Measures was initiated on April 8, 2019. At that time, the notification that an Assessment of Corrective Measures has been initiated required at 40 C.F.R. § 257.107(h)(7) was only for unlined surface impoundments as stated in 40 C.F.R. § 257.95(g)(5). 40 C.F.R. §§ 257.107(h)(7) and 257.105(h)(9) point to 40 C.F.R. § 257.95(g)(5), which states: "If an assessment of corrective measures is required under § 257.96 by either paragraph (g)(3)(i) or (g)(4) of this section, and if the CCR unit is **an existing unlined CCR surface impoundment** as determined by § 257.71(a), then the CCR unit is subject to the closure requirements under § 257.101(a) to retrofit or close. In addition, the owner or operator must prepare a notification stating that an assessment of corrective measures has been initiated." [emphasis added]. As part of the "Part A: Deadline to Initiate Closure" update published on August 8, 2020, 40 C.F.R. §257.95(g)(5) was updated to remove the specificity only requiring the notification for unlined surface impoundments; however, that change has not been adopted by the TCEQ.

### **NOD Item No. 4**

*A1 Landfill: Provide a site-specific technical justification explaining the use of well BMW-11A-R as the background well for the A1 Area Landfill CCR Unit. For example: Provide additional 'background' groundwater quality for comparison, or provide additional discussion on alternative statistical methods used to address the EPA comment from the Notice Letter dated Feb. 4, 2025. Section 2.4 (.pdf p. 511) and Appendix C (.pdf pages 1498-1506) of the CCRRBGMandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the interwell statistical method, which uses*

*the background well groundwater quality, and therefore, the 'background nature' of well BMW-11A-R comes into question.*

**Response:**

The A1 Area Landfill was constructed on top of disturbed overburden soil (mine spoil) that was previously mined then backfilled as part of lignite mining operations at the former Beckville Lignite Mine. The Beckville Lignite Mine, which is a subsection of the former Martin Lake Lignite Mine, formerly operated and is regulated under a surface mining permit issued by the Railroad Commission of Texas (RRC). The A1 Area Landfill is surrounded to the north, east, and west by former mined areas (see Attachment 2, Figure 1). Areas to the southeast near the mine permit boundary are reportedly unmined. There is a well, BMW-31, located in an unmined area southeast and hydraulically downgradient of the A1 Area Landfill that was used as a CCR delineation well during the Assessment of Corrective Measures that was performed at the A1 Area Landfill in 2019 (Golder, 2019a). BMW-31 has only been sampled during the Assessment of Corrective Measures and has only been analyzed for fluoride and lithium. The BMW-31 sample results for those constituents (0.255 mg/L and 0.0203 mg/L, respectively) are similar to those observed in background well BMW-11A-R. Fluoride in BMW-11A-R has ranged from below the detection limit (<0.10 mg/L) to 0.353 mg/L. Lithium in BMW-11A-R has ranged from 0.0139 mg/L to 0.0686 mg/L. The limited sample data from BMW-31 falls within the range of concentrations observed at BMW-11A-R.

The CCR groundwater monitoring well network at the A1 Area Landfill was initially established when the CCR Rule was issued by the EPA in 2015 using Site monitoring wells BMW-11A-R, BMW-18, BMW-19, BMW-20, BMW-21, BMW-22, BMW-23, and BMW-24. Monitoring wells BMW-26, BMW-27, and BMW-28 were added to the CCR monitoring network in 2016 and well BMW-33 was added to the CCR monitoring network in 2020. Eight background groundwater monitoring events were performed from October 2015 to December 2016. The highest groundwater elevation during the background monitoring period was consistently observed at well BMW-11-AR. As a result, BMW-11-AR was designated as an upgradient well relative to the A1 Area Landfill and was used to establish background concentrations of Appendix III and IV constituents. Well BMW-33 is also located hydraulically upgradient of the A1 Area Landfill, but it was added after background had been established; therefore, it was not used to establish background.

The following statistical evaluation methods were selected to demonstrate groundwater compliance for the A1 Area Landfill under the CCR Rule:

- Use of interwell data evaluations, which compare new sample data to data from upgradient or background monitoring wells.
- Use of upper prediction limits (UPLs) to develop site-specific background concentrations for all Appendix III and Appendix IV constituents. This approach is a common statistical method used

to evaluate groundwater compliance for Subtitle D landfill facilities and is one of the approved options for groundwater quality data statistical evaluation under the CCR Rule.

- In detection monitoring, Appendix III constituent concentrations from each well are compared to background UPLs to ascertain if a statistically significant increase above background exists. Background UPLs are based on a 1-of-2 resampling approach, meaning that if zero or one concentration measurement from a series of two independent samples collected from a well do not exceed the appropriate UPL, then a statistically significant increase over background has not occurred at a CCR unit.
- In assessment monitoring, the 95% lower confidence limit of the mean (LCL) is calculated after each assessment monitoring event for each Appendix IV constituent. The set of data used to calculate LCLs is based on current and historical constituent concentrations. A statistically significant increase over the GWPS has occurred at a CCR unit when the LCL for at least one assessment monitoring constituent at a well is greater than the appropriate GWPS.

The statistical evaluation procedures used for the A1 Area Landfill groundwater data conform with the CCR Rule requirements in 40 C.F.R. § 257.93, as well as EPA's *Unified Guidance: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (Unified Guidance)* (EPA, 2009) and the American Society for Testing and Materials (ASTM) standard D6312-17, *Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs at waste Disposal Facilities* (ASTM, 2017).

The CCR regulations that govern the registrations for PDP-5, the Ash Ponds, and the A1 Area Landfill are focused on detecting and responding to releases from a regulated CCR unit, not from other sources such as mine spoil or other potential sources that are not regulated under the CCR Rule. See 40 C.F.R. § 257.91(a). Thus, the regulations do not require an operator to demonstrate background groundwater conditions absent any operations of the facility, or "pristine" conditions that pre-date any CCR disposal activities at the site. EPA has consistently explained that 40 C.F.R. § 257.91 requires a facility to determine background groundwater quality that has not been affected by **"the CCR unit."** See, e.g., 75 Fed. Reg. 35,128, 35,181 (June 21, 2010); 80 Fed. Reg. 21,302, 21,399, 21,400 (Apr. 17, 2015). Further, the regulations specifically provide that a facility operator "may demonstrate that a source **other than the CCR unit** caused the statistically significant increase over background levels for a constituent," in which case no corrective action under the regulations is required. 40 C.F.R. § 257.94(e)(2) [emphasis added].

In addition, EPA has consistently relied on the *Unified Guidance* to determine if a statistical approach meets the performance standards in 40 C.F.R. § 257.93. See, e.g., 80 Fed. Reg. at 21,402; 85 Fed. Reg. 53,516, 53,543 (Aug. 28, 2020). According to the *Unified Guidance*, "[t]he most important quality of background is that it reflects the historical conditions unaffected by the activities it is designed to be compared to. These conditions could range from an uncontaminated aquifer **to an historically contaminated site baseline unaffected by recent RCRA-actionable contaminant releases**



[emphasis added]. Representative background data will therefore have numerical characteristics closely matching those arising from the site-specific aquifer being evaluated.” *Unified Guidance* at 5-1. The *Unified Guidance* does not prohibit a regulated unit from being located downgradient of other potential source areas or establishing background in groundwater that may be influenced by anthropogenic activities unrelated to the regulated unit. The objective of the statistical approaches presented in the *Unified Guidance* is to identify releases from regulated CCR units or changes in existing conditions as expeditiously as possible. As discussed in the response to NOD Item No. 2, the current CCR groundwater monitoring well network (and statistical approach) has been effective at detecting SSIs/SSLs in downgradient wells at the A1 Area Landfill.

In summary, the statistical approach utilized for the A1 Area Landfill CCR groundwater monitoring program conforms with the CCR Rule and with commonly accepted methods for evaluating groundwater monitoring data, and has been effective at identifying SSIs/SSLs in monitoring wells downgradient of the A1 Area Landfill; therefore, the groundwater monitoring system and statistical methods, including methods used to establish background, satisfy the groundwater monitoring performance standard of the CCR Rule.

#### **NOD Item No. 5**

*PDP5: Please provide a narrative that addresses the fact there is no true background well because of groundwater mounding and radial groundwater flow centered on well MW-18A.*

#### **Response:**

PDP-5 was constructed in 2010, prior to the CCR Rule being issued by EPA in 2015. PDP-5 has been registered and regulated under the TCEQ IHW Program as industrial non-hazardous solid waste management unit No. 024 (TCEQ Solid Waste Registration No. 31277) since it was constructed. TCEQ reviewed the PDP-5 monitoring well network as part of the registration package that was submitted to and approved by the TCEQ IHW Program. Several monitoring wells have been replaced or added over time, but the current monitoring well locations are similar to those that the TCEQ approved as part of the IHW registration approval.

The PDP-5 CCR groundwater monitoring system has been certified by a professional engineer in accordance with 40 C.F.R § 257.91 (PBW, 2017a). The PDP-5 CCR groundwater monitoring system consists of nine monitoring wells that are each screened in the uppermost aquifer at the Site. PDP-5 extends above natural grade and the PDP-5 area represents a localized topographic high from which groundwater flows radially outward. Data collected as part of the CCR groundwater monitoring events are evaluated using procedures described in the Statistical Analysis Plan for the unit (Golder, 2022d) to identify SSIs of Appendix III parameters over baseline concentrations. An intrawell data evaluation approach is used to compare the sample data to historical data at each groundwater monitoring well based on the following:



- Topographic and groundwater elevations near PDP-5 are higher than those in the surrounding area. Groundwater is mounded and flows radially outward in the vicinity of PDP-5 due to the topography near the impoundment's location.
- As shown on the groundwater potentiometric surface maps that were previously submitted to the TCEQ as part of the PDP-5 CCR Program registration package (PBW, 2017; BBA, 2024), three supplemental wells (PDP-27, PDP-28, and PDP-29) were installed at distances up to approximately 1,340 feet from PDP-5 and were gauged during the background period to evaluate groundwater elevations and groundwater flow directions in the vicinity of PDP-5 beyond the CCR groundwater monitoring network of wells. The groundwater potentiometric surface maps developed during the background monitoring period are reproduced in Attachment 3. The groundwater elevation data collected from these supplemental groundwater wells indicate that groundwater elevations continue to decrease at distances greater than 1,300 feet from PDP-5 and suggest that groundwater elevations would continue to decrease beyond the western property boundary of the MLSES along Farm-to-Market Road 2658. Groundwater elevations at PDP-5 are also considerably higher than those measured in the CCR groundwater monitoring wells in the Ash Pond Area, which is located east of the MLSES power block and east of PDP-5.
- Use of intrawell data evaluations complies with CCR Rule requirements as well as EPA's *Unified Guidance* (EPA, 2009). Intrawell data evaluations compare water quality data in each well against baseline values established from that well's own historical water quality data.

40 C.F.R § 257.93(f) allows a facility to use any statistical test method in evaluating groundwater monitoring data so long as the method "meets the performance standards of [40 C.F.R § 257.93(g)]." On at least two occasions, EPA has made clear that intrawell monitoring is not "per se prohibited by the CCR regulations" and that intrawell monitoring can meet the requirements of 40 C.F.R §§ 257.93(f) and (g) in some circumstances. See 85 Fed. Reg. at 53,543; see also 89 Fed. Reg. 38,950, 39,079, 39,064 (May 8, 2024). In fact, the agency has recognized that "intrawell comparison may be the *preferred* method" in certain circumstances. 85 Fed. Reg. at 53,543 (citing *Unified Guidance* at 5-6).

EPA has consistently relied on the *Unified Guidance* to determine if a statistical approach meets the performance standards in 40 C.F.R § 257.93. See, e.g., 80 Fed. Reg. at 21,402; 85 Fed. Reg. at 53,543. According to the *Unified Guidance*, intrawell comparisons are appropriate when, among others, there is evidence of spatial variability, upgradient well background becomes contaminated, groundwater flow gradient is uncertain or unstable, or unique hydrogeological conditions otherwise preclude meaningful interwell comparisons. *Unified Guidance* at 5-6, 5-7, 8-3; 85 Fed. Reg. at 53,543; see also *Unified Guidance* at B-6 ("[I]nterwell comparisons between upgradient and downgradient well locations are not always appropriate, either due to natural spatial variability, screening of background and downgradient wells in different hydrostratigraphic positions, effects of groundwater mounding, etc. In

such cases, the appropriate statistical approach is to use an *intrawell* test at each compliance location.”).

According to the *Unified Guidance*, intrawell monitoring is appropriate at PDP-5. The *Unified Guidance* explains that “[f]or sites historically contaminated above background, the only way to effectively monitor compliance wells may be to establish a historical intrawell baseline and measure increases above this baseline.” *Unified Guidance* at 8-3. Intrawell monitoring may also be the best method when changes in groundwater quality impact upgradient background wells. *Id.* at 4-9; see also *id.* at 6-32 (discussing the advantages of using intrawell background). Thus, based on conditions at PDP-5, intrawell monitoring is an appropriate approach for establishing background groundwater quality for PDP-5.

**NOD Item No. 6**

*PDP-5 Area: Provide additional narrative explaining the use of intrawell data evaluation statistical analysis method used in Surface Impoundment PDP 5, groundwater monitoring systems at the Martin Lake CCR Unit.*

*Section 2.4 (.pdf p. 2275) and Appendix C (.pdf pages 2997-3006) of the CCRRBG MandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the intrawell statistical method.*

**Response:**

See response to NOD Item No. 5.

**NOD Item No. 7**

*Update the geological cross sections across the PDP-5 Surface Impoundment (and the closed PDPs-1, 2 and 3) (A-A' and B-B') to include other nearby wells to extend the subsurface geology beyond the unit boundary. Also include the historical highest and lowest groundwater levels at each additional well added to the cross section.*

*PDP 5: Provide a narrative explaining the groundwater table elevations that occur above the base of the closed units, within the closed middle portion of PDP 1, 2, and 3. The PDP-5 Addendum 1 includes two cross sections across the PDP 5 Impoundment (A-A' and B-B'). The cross sections include historical maximum and minimum groundwater elevations on wells MW-20A and MW-18A on A-A' and wells PDP-25 and MW-19 on B-B.' The groundwater table elevations occur above the base of closed units: PDP-1, PDP-2, and PDP-3.*

**Response:**

The updated PDP-5 cross sections are provided in Attachment 4.

Closed PDP units PDP 1, 2, and 3 are regulated under the TCEQ IHW Program as industrial, non-hazardous solid waste management unit nos. 004, 005, and 006, respectively (TCEQ Solid Waste Registration No. 31277). TCEQ approved closure of PDP 1, 2, and 3 in a letter issued March 12, 2015.

The TCEQ closure approval letter stated that a release from the closed former impoundments was not indicated and that no further action was required other than filing a deed notice to restrict groundwater usage within the footprint of the closed former impoundments. A copy of the TCEQ closure approval letter is provided in Attachment 5.

It is important to note that the Texas and federal CCR regulations do not apply to any and all CCR activities or CCR disposal at a facility. For example, PDP 1, 2, and 3 are not regulated under the federal regulations that TCEQ adopted by reference in 30 TAC Chapter 352—that is, certain identified regulations at 40 C.F.R. Part 257, as amended through July 2, 2015.

The pending registrations pursuant to 30 TAC § 352.101 are only for PDP-5, the Ash Ponds, and the A1 Area Landfill. PDP 1, 2, and 3 are not regulated by 30 TAC Chapter 352 as CCR units and do not require registrations. Instead, the prior closure of PDP 1, 2, and 3 and any necessary monitoring or corrective action measures are covered by other Texas regulatory programs. In previously examining PDP-5's compliance status under the 2015 federal regulations (the ones adopted by Texas), EPA has considered only the requirement to monitor for potential releases from PDP-5 (the *regulated* CCR unit) using groundwater conditions “prior to operation of PDP-5,” not prior to the operation of PDP 1, 2, and 3. See EPA, *Proposed Denial of the CCR Part B Alternate Liner Demonstration Application for the Martin Lake Steam Electric Station*, at 17 (Jan. 25, 2023).

#### **NOD Item No. 8**

*PDP-5 Area: Provide a narrative explaining the historical variation of the potentiometric contours including the radial groundwater flow direction in the PDP-5 Area. Use all of the wells in the groundwater monitoring system and any non-CCR wells available in the surrounding areas for construction of the potentiometric surface contours or explain why those wells are excluded. (The initial maps in 2017 and map year October 4, 2021, shows four flow directions (radial) and map year 2024 shows 2 flow directions). Overall, the facility shows radial flow. Provide a groundwater monitoring system that has a sufficient number of wells and a well spacing adequate to monitor any downward and/or lateral movement of potential contaminants in all directions due to radial flow, see comment 3 above.*

#### **Response:**

Luminant and its consultants working on the PDP-5 CCR project have consistently maintained that the PDP-5 area represents a localized topographic high from which groundwater flows radially outward. The CCR groundwater monitoring wells are spaced at semi-regular intervals around the perimeter of PDP-5 and are positioned to monitor groundwater conditions on all sides and in all downgradient directions from the unit. In constructing groundwater potentiometric surface maps for areas where groundwater radial flow occurs, the groundwater potentiometric contours will always have breaks in the contour lines if the monitoring network consists of a single ring of wells, regardless of how closely the wells are spaced. As discussed in the response to NOD Item No. 5, three supplemental wells (PDP-27,

PDP-28, and PDP-29) were installed and gauged during the background monitoring period to evaluate groundwater elevations and groundwater flow directions in the vicinity of PDP-5 beyond the CCR groundwater monitoring network of wells. Groundwater potentiometric maps that include groundwater elevation data from the supplemental wells have consistently demonstrated radial groundwater flow around the PDP-5 area (see Attachment 3). These supplemental wells were not incorporated into the CCR groundwater monitoring network because they are not located near the unit's waste boundary and, therefore, are not ideally positioned to monitor groundwater quality, as the CCR monitoring wells are.

The 2024 groundwater potentiometric maps noted in the TCEQ's comment show radial groundwater flow centered around MW-18A and the east-central side of PDP-5. Based on the consistent historical record of radial flow around the PDP-5 area, groundwater elevations are expected to decrease east of MW-18A.

In order to clearly demonstrate the radial flow conditions in the PDP-5 area, Luminant proposes to gauge water levels in supplemental wells PDP-27, PDP-28, and PDP-29 during future CCR monitoring events. Because both semiannual 2025 monitoring events have already been completed, gauging of the supplemental wells would begin during the first semiannual monitoring event in 2026. If TCEQ agrees with this plan, the PDP-5 Groundwater Monitoring Plan will be updated to provide that PDP-27, PDP-28, and PDP-29 will be gauged during each semiannual monitoring event, and the revised monitoring plan will be submitted to the TCEQ.

#### **NOD Item No. 9**

*Provide additional water quality data from nearby wells or previous studies that indicate similar concentrations for SSI constituents to support the natural-source explanation within the ASD.*

*Provide the location of the ASD-referenced sampled wells (distance and direction) in the Sabine uplift area in Texas, as cited in Texas Bureau of Economic Geology report (1991) as stated in the ASD submission.*

#### **Response:**

The uppermost aquifer at the Site consists of unconsolidated, sandy sediments belonging to the Wilcox Group (see geologic map in Attachment 6). The Wilcox Group, with the overlying Carrizo Sand Formation, forms the Carrizo-Wilcox Aquifer that runs from northeast Texas near Rusk and Panola Counties to south Texas near Dimmit and Webb Counties. The historical Appendix III parameter concentrations observed in the PDP-5 CCR monitoring wells are typical of concentrations observed in groundwater samples collected from other wells completed in the Carrizo-Wilcox Aquifer in the region. The Bureau of Economic Geology at the University of Texas at Austin (BEG) has summarized water chemistry data from Carrizo-Wilcox wells in the Sabine Uplift region of Texas, which includes the Martin Lake facility. The Carrizo-Wilcox groundwater samples summarized in the BEG study (Fogg et al., 1991) were analyzed for several Appendix III constituents, including calcium, chloride, pH, sulfate, and

total dissolved solids (TDS). The ranges and average concentrations observed for these constituents in the BEG study and in the PDP-5 CCR monitoring wells are summarized below:

**Carrizo/Wilcox Groundwater Concentration Ranges**

| <b>Constituent</b> | <b>BEG Regional Study<br/>(Fogg et al., 1991)<br/>(mg/L)</b> | <b>PDP-5 CCR Groundwater<br/>Samples<br/>(mg/L)</b> |
|--------------------|--------------------------------------------------------------|-----------------------------------------------------|
| Calcium            | 0.10 – 4,374                                                 | 1.0 – 226                                           |
| Chloride           | 2.0 – 1,080                                                  | 1.1 – 135                                           |
| pH                 | 4.5 – 8.9                                                    | 4.2 – 6.98                                          |
| Sulfate            | 0 – 1,570                                                    | 1 – 489                                             |
| TDS                | 35 – 2,018                                                   | 45 – 1,190                                          |

**Carrizo/Wilcox Groundwater Concentration Averages**

| <b>Constituent</b> | <b>BEG Regional Study<br/>(Fogg et al., 1991)<br/>(mg/L)</b> | <b>PDP-5 CCR Groundwater<br/>Samples<br/>(mg/L)</b> |
|--------------------|--------------------------------------------------------------|-----------------------------------------------------|
| Calcium            | 30.3                                                         | 28                                                  |
| Chloride           | 68.2                                                         | 23                                                  |
| pH                 | 7.7                                                          | 6.6                                                 |
| Sulfate            | 40.7                                                         | 104                                                 |
| TDS                | 469                                                          | 305                                                 |

The ranges of Appendix III concentrations observed in the PDP-5 CCR groundwater monitoring well samples are consistent with those in the BEG study. The average concentrations for the PDP-5 samples are considerably lower than the upper end of concentrations observed in the BEG study and are similar to the BEG study averages overall. The PDP-5 sample averages are lower than the BEG study averages for all constituents other than sulfate. The variability in constituent concentrations in the Carrizo-Wilcox wells at the Site and in the region is high, with considerable variability occurring between sample locations and between sampling events. For example, the sulfate results in the BEG study have a standard deviation (i.e., the amount of variation from the mean sulfate value) of 103 mg/L. The standard deviation of sulfate concentrations in the PDP-5 CCR monitoring wells is similarly high at 130 mg/L.

The groundwater sample data from the BEG study are reproduced in Attachment 6, Table 1. The well location map from the BEG study is reproduced on Attachment 6, Figure 1 with the approximate location of the Martin Lake Steam Electric Station added for reference. Groundwater sample data collected as part of the PDP-5 CCR program were presented in the 2024 Annual Groundwater Monitoring and Corrective Action Report (BBA, 2025b) and in other documents submitted to the TCEQ as part of the CCR unit registration.

The significance of the BEG data set is that it represents groundwater data from the same geologic setting as the Site. Proximity to the Site is not necessarily more or less relevant to the observed water quality at the Site than the geologic setting in general; however, as requested by the TCEQ, BBA also reviewed the BEG study data to specifically identify wells located near the Martin Lake facility. The Martin Lake facility is located near the border of Rusk and Panola Counties in the outcrop area of the Wilcox Group (Attachment 6, Figures 1 and 2). Because the PDP-5 CCR monitoring wells are completed to total depths ranging from 25 to 67 feet below ground surface (bgs), the BEG study was reviewed to identify wells within Rusk and Panola Counties that were completed to less than 100 feet bgs with available groundwater data. The wells that meet these criteria are highlighted on the BEG well location map on Attachment 6, Figure 1. There were no wells identified in the immediate vicinity of the Martin Lake facility that were completed in the upper 100 feet bgs. There is one well with sample data (well no. 3552101) that is reportedly located within approximately 2 to 3 miles of the Martin Lake facility, but the well is completed deeper than the CCR monitoring wells, with a total depth of almost 200 feet. Similarly, in EPA's recent facility assessment of PDP-5 (EPA, 2025), EPA noted, based on Texas Water Development Board (TWDB) Groundwater Database records, the presence of a shallow water well (well no. 3544701) located offsite but near the Martin Lake facility; however, the TWDB water chemistry data sheets that EPA cited in their facility assessment letter incorrectly listed the well depth as 26 feet. The number 26 is the construction form item number shown next to the total depth item on the well construction form. The driller's well construction form lists the total depth of the well as 555 feet, which is considerably deeper than the PDP-5 CCR monitoring wells and thus not informative.

The BEG study included fourteen wells completed in the upper 100 feet bgs in Rusk or Panola Counties that had available groundwater sample data. The pH results for the well samples ranged from 6.5 to 7.6, the calcium results ranged from 6.5 mg/L to 157 mg/L, the chloride results ranged from 5.0 mg/L to 212 mg/L, the sulfate results ranged from 4.0 mg/L to 284 mg/L, and the TDS results ranged from 42.6 mg/L to 1,033 mg/L (Attachment 6, Table 1). These results are very similar to the ranges observed in the PDP-5 CCR monitoring well samples as listed in the tables above. Some PDP-5 CCR monitoring well sample results fall outside the data ranges for the shallow BEG study wells in Rusk and Panola County; however, the variability in parameter ranges is high in both the CCR and BEG well data; therefore, the minor discrepancies between the data sets are not unexpected, and do not indicate a release from the unit. Furthermore, the CCR well parameter ranges for calcium, chloride, sulfate, and TDS are within the ranges observed in the larger regional BEG data set. There have been occasional measurements of low pH over the 10-year CCR Program monitoring period, including one measurement (in well PDP-24 in September 2018) that fell outside the range observed in the larger regional BEG data set; however, in each case, the low pH measurements measured at the Site could not be confirmed during the following semiannual monitoring event. A representative water sample was collected from PDP-5 on October 28, 2021 (Golder, 2021). The PDP-5 water sample had a pH measurement of 8.31, which is higher than all groundwater pH measurements collected as part of PDP-5 CCR groundwater monitoring program. The relatively higher pH of the surface impoundment sample compared to that of the PDP-5 groundwater samples suggests that a release from PDP-5 would



increase the pH of groundwater instead of decreasing it or creating acidic conditions in the aquifer. Based on the long record of pH measurements collected as part of the CCR groundwater monitoring program and the pH measured in PDP-5, there is no indication of a release from the unit or ongoing adverse conditions associated with pH.

The BEG study did not evaluate boron data in Carrizo-Wilcox wells in the Sabine Uplift region; therefore, a direct comparison of the CCR groundwater monitoring data to regional boron concentrations was not available. However, another BEG study completed in 2019 (BEG and INTERRA, 2019) summarized boron water chemistry data in Carrizo-Wilcox wells across the TWDB's Management Area 13, which includes the extension of the Carrizo-Wilcox Aquifer into central and south Texas. Boron concentrations observed in that study ranged from about 0.1 to 26.5 ppm. Approximately fifty wells evaluated in the study that were distributed throughout the aquifer had boron concentrations in the 0.5 to 26.5 mg/L range. For comparison, boron concentrations in the PDP-5 CCR groundwater samples average 0.57 mg/L, and range from 0.023 mg/L to 4.24 mg/L.

The TCEQ groundwater ingestion PCL for boron is 4.9 mg/L for residential land use and 15 mg/L for commercial-industrial land use (TCEQ, 2025). The boron concentrations in all samples collected as part of the PDP-5 CCR groundwater monitoring program have been lower than the TCEQ groundwater ingestion PCLs for both residential and commercial-industrial land use. As such, the boron concentrations observed at the Site do not represent elevated concentrations relative to the concentrations that the TCEQ considers to be protective of human health and the environment. Furthermore, the boron groundwater concentrations observed in downgradient wells at the Martin Lake Ash Pond Area—where SSIs and SSLs have been identified and attributed to the Ash Pond CCR units, and where an assessment of corrective measures and remedy selection process have been completed—are considerably higher than those observed in the PDP-5 CCR groundwater monitoring wells. Historical boron concentrations in downgradient wells in the Ash Pond Area average about 7.5 mg/L, with maximum concentrations above 20 mg/L in some downgradient wells. PDP-5 receives CCR contact water from the Ash Ponds; therefore, if a release from PDP-5 had occurred, one would expect the boron groundwater concentrations at PDP-5 to be similar to those observed in the Ash Pond Area, which they are not. Note that the liner systems for the Ash Pond CCR units (East Ash Pond, West Ash Pond, and New Scrubber Pond) were retrofitted from 2020 to 2023. Boron groundwater concentrations in the Ash Pond Area have begun to decrease since the liner retrofits were completed.

In summary, PDP-5 CCR monitoring well data do not indicate conditions that deviate from typical Carrizo-Wilcox groundwater quality conditions. Based on the aquifer studies and regulatory standards discussed above, constituent concentrations observed in the PDP-5 wells do not represent excessive concentrations that would indicate a release from the unit.

#### **NOD Item No. 10**

*Update the (C-C') Cross Section in Appendix F - Ash Pond with the historical maximum and minimum groundwater levels and trace the bottom of the three Ash Pond Units on the cross section (as in CCR*

*Assessment of Corrective Measures Report, September 2019, pdf pg. 37) showing the geological formations and the separation between the groundwater table and the bottom of the Ash Ponds.*

*The Groundwater Monitoring Report 2021 shows a North and Northeast (NE) groundwater flow direction, a North NE to NE direction in 2022, and a NE direction again in 2023 and 2024.*

*Address the following:*

*Justify the well spacing in the Ash Pond area in the down-gradient direction.*

*Justify how the present groundwater monitoring well network can detect any release of potential contaminants from the Ash Pond area based upon the existing number of wells and well spacing.*

**Response:**

The Ash Pond Area cross sections have been updated as requested. In addition to the requested changes, the updated cross sections also incorporate lithologic data from other non-CCR wells in order to form a more complete view of the subsurface in the Ash Pond Area. The updated cross sections are provided in Attachment 7.

A qualified professional engineer has certified that the CCR groundwater monitoring system at the Ash Pond Area was designed and constructed to meet the groundwater monitoring system requirements of the *Groundwater Monitoring Systems* section [40 C.F.R § 257.91] of the CCR Rule (PBW, 2017c). The CCR Rule specifies that a CCR groundwater monitoring system must consist of a minimum of one upgradient and three downgradient wells. The Ash Pond Area CCR groundwater monitoring system consists of seven monitoring wells, including three upgradient wells and four downgradient wells. The CCR monitoring wells were completed within the uppermost aquifer at approximately regular intervals along the upgradient and downgradient sides of the CCR units to (1) determine the direction of groundwater flow, (2) monitor upgradient groundwater conditions to establish background concentrations, and (3) monitor downgradient areas of the CCR units so that potential releases from the unit could be detected.

The TCEQ reviewed the Ash Pond Area monitoring well network as part of the registration package that was submitted to and approved by the TCEQ IHW Program when the units were first constructed. Several wells were replaced when the CCR groundwater monitoring program was initiated in 2015, but the current monitoring well locations are similar to those included in the monitoring well network that the TCEQ approved as part of the IHW registration approval.

The Ash Pond Area monitoring well network considers local geology and groundwater conditions to accurately represent the quality of groundwater passing the waste boundary of the CCR unit as required by 40 C.F.R. § 257.91(a). Based on soil borings completed at the Site, the geology of the Ash Pond Area consists of three distinct stratigraphic zones. The upper zone (Zone A/X) is generally composed of an approximately 30- to 40-foot thick low to medium plasticity, lean clay to clayey sand unit. The upper zone is underlain by a fine sand and silty sand unit (Zone B) that is generally about 5 to



20 feet thick (PBW, 2017c). The Zone B sand is underlain by a continuous silty to sandy confining clay unit.

An Affected Property Assessment (APA) was conducted at the Ash Pond Area in accordance with TCEQ Texas Risk Reduction Program (TRRP) standards beginning in 2009 as a result of the detection of selenium concentrations in groundwater that exceeded the TRRP Tier 1  $^{GW}GW_{Ing}$  protective concentration level (PCL). An APA Report (APAR) that summarized the assessment was submitted to the TCEQ in May 2011 (PBW, 2011) and was approved by the TCEQ in December 2011 (TCEQ, 2011). Aquifer tests (slug tests) were conducted in both Zone A/X and Zone B as part of the APAR investigation. The hydraulic conductivities of Zone A/X reportedly ranged from  $3.5 \times 10^{-6}$  to  $3.8 \times 10^{-4}$  cm/sec, while those for Zone B ranged from  $1.2 \times 10^{-4}$  to  $7.5 \times 10^{-3}$  cm/sec. Zone A/X is classified in the APAR as a Class 3 groundwater resource and is not considered a reliable water resource. Zone B was classified in the APAR as a Class 2 groundwater resource and could be a reliable water resource; however, there are no groundwater receptors or production wells located downgradient of the Ash Ponds. Based on the findings of the TCEQ-approved APAR investigation, Zone B is considered the uppermost aquifer in the Ash Pond Area. The TCEQ approved the groundwater monitoring network for the Ash Pond Area as part of the APAR approval.

The current CCR groundwater monitoring well network has been effective at detecting SSIs/SSLs in downgradient wells at the Ash Pond Area. The initial Detection Monitoring Program groundwater samples were collected from the Ash Pond Area CCR monitoring well network in September 2017. The evaluation of those data was completed in 2018 using procedures described in the Statistical Analysis Plan (Golder, 2022d) to identify SSIs of Appendix III parameters over background concentrations. Alternate source evaluations were inconclusive for one or more of the SSIs. Consequently, an Assessment Monitoring Program was initiated and established for the Ash Pond Area in June 2018 in accordance with 40 C.F.R. § 257.94(e)(2). Concentrations of Appendix IV constituents at SSLs above GWPSs were initially identified in January 2019 for beryllium, cobalt, and lithium; however, beryllium and cobalt are the only Appendix IV constituents that are currently observed at SSLs above the GWPSs (BBA, 2025c). During the most recent reporting period (2024), SSLs above GWPSs were observed in the Ash Pond Area for beryllium in downgradient wells H-29, H-31, and H-32 and cobalt in downgradient wells H-28, H-31, and H-32. The liner systems for the Ash Pond CCR units (East Ash Pond, West Ash Pond, and New Scrubber Pond) were retrofitted from 2020 to 2023. Concentrations of beryllium and cobalt in groundwater samples from wells downgradient of the Ash Ponds have generally begun to decrease since the liner retrofits were completed.

An Assessment of Corrective Measures was initiated on April 8, 2019, and was completed on September 5, 2019, in accordance with 40 C.F.R. § 257.96 to address the Appendix IV SSLs (Golder, 2019b). A public meeting was held on November 13, 2019, pursuant to 40 C.F.R. § 257.96(e), to discuss the results of the Assessment of Corrective Measures. A Remedy Selection Report (Golder, 2022e) was completed in January 2022 in accordance with the requirements of 40 C.F.R. § 257.97. Monitored natural attenuation (MNA) with source control measures was selected as the remedy to

address the Appendix IV constituents observed at SSLs after a site-specific feasibility study to evaluate MNA as a potential groundwater remedy was performed in accordance with guidance and best practices promulgated by the EPA (EPA, 2007a and 2007b) and Interstate Technology and Regulatory Council (ITRC, 2010).

In summary, the Ash Pond Area groundwater monitoring system has been effective at identifying SSIs/SSLs and satisfies the groundwater monitoring performance standard of the CCR Rule.

**NOD Item No. 11**

*Provide information on using H-26, H-27, and H-33 as background wells as the groundwater may be affected by the operations of the facility (e.g. coal piles) to the west, which is upgradient (based on applicant-supplied groundwater flow maps) to these background wells. This may be based upon:*

*Groundwater or other monitoring data to substantiate the ‘background’ quality of these three upgradient, background wells.*

*Additionally, include any geotechnical analyses of the ‘ML’ lithologic unit that may indicate a low-flow boundary or ‘isolation’ of the lower sand body, in which the background wells are completed (as indicated in Cross Section C-C’), from the operations of the facility (e.g. coal piles).*

**Response:**

Affected groundwater has not been identified in the area of the facility’s coal piles. Furthermore, the coal pile area and other areas near the power generation units are not regulated by the CCR regulations. Several groundwater investigations have been performed at the Martin Lake facility under TRRP (PBW, 2014; PBW, 2011; PBW, 2005), but none of the investigations have indicated the Ash Pond Area may be impacted by facility operations upgradient of the Ash Pond Area.

The CCR regulations that govern the registrations for PDP-5, the Ash Ponds, and the A1 Area Landfill are focused on detecting and responding to releases from a regulated CCR unit, not from other sources like a previously closed unit regulated under a different program, a coal pile, mine spoil, or other area at the facility. See 40 C.F.R. § 257.91(a). Thus, the regulations do not require an operator to demonstrate background groundwater conditions absent any operations of the facility, or “pristine” conditions that pre-date any CCR disposal activities at the site. EPA has consistently explained that 40 C.F.R. § 257.91 requires a facility to determine background groundwater quality that has not been affected by “**the CCR unit.**” See, e.g., 75 Fed. Reg. at 35,181; 80 Fed. Reg. at 21,399, 21,400. Further, the regulations specifically provide that a facility operator “may demonstrate that a source **other than the CCR unit** caused the statistically significant increase over background levels for a constituent,” in which case no corrective action under the regulations is required. 40 C.F.R. § 257.94(e)(2) [emphasis added].

In addition, EPA has consistently relied on the *Unified Guidance* to determine if a statistical approach meets the performance standards in 40 C.F.R. § 257.93. See, e.g., 80 Fed. Reg. at 21,402; 85 Fed. Reg. at 53,543. According to the *Unified Guidance*, “[t]he most important quality of background is that it

reflects the historical conditions unaffected by the activities it is designed to be compared to. These conditions could range from an uncontaminated aquifer **to an historically contaminated site baseline unaffected by recent RCRA-actionable contaminant releases** [emphasis added]. Representative background data will therefore have numerical characteristics closely matching those arising from the site-specific aquifer being evaluated.” *Unified Guidance* at 5-1. The *Unified Guidance* does not prohibit a regulated unit from being located downgradient of other potential source areas or establishing background in groundwater that may be influenced by anthropogenic activities unrelated to the regulated unit(s). The objective of the statistical approaches presented in the *Unified Guidance* is to identify releases from regulated CCR units or changes in existing conditions as expeditiously as possible. As discussed in the response to NOD Item No. 10, the current CCR groundwater monitoring well network (and statistical approach) has been effective at detecting SSIs/SSLs in downgradient wells at the Ash Pond Area. As such, the established background concentrations satisfy the groundwater monitoring performance standard of the CCR Rule.

#### **NOD Item No. 12**

*Cross section C-C’ (Groundwater Monitoring System Certification Report, October 16, 2017, pg. 21) illustrates that the Ash Pond(s) monitoring wells are completed into the lower sand lithologic unit. This sand unit is partially isolated by a clay lithologic unit in the eastern three-quarters of the Ash Pond Management Unit. Cross section C-C’ from the CCR Assessment of Corrective Measures Report (September 2019) illustrates that the three surface impoundments lie, either partially or wholly, within the upper sand lithologic unit.*

*Justify how no monitoring wells were completed within the upper sand unit at least in the portions of the Ash Pond Management Unit that are underlain by the ‘isolating’ clay unit.*

#### **Response:**

As discussed in the response to NOD Item No. 11, an APAR investigation was conducted at the Ash Pond Area in accordance with TCEQ TRRP standards beginning in 2009 due to the detection of selenium concentrations in groundwater that exceeded the TRRP Tier 1 <sup>GW</sup>GW<sub>Ing</sub> PCL. An APAR that summarized the investigation findings was submitted to the TCEQ in May 2011 (PBW, 2011) and was approved by the TCEQ in December 2011 (TCEQ, 2011). As part of the APAR investigation, aquifer tests (slug tests) were conducted in the upper clay and clayey sand lithologic unit (Zone A/X) and the deeper sandy lithologic unit (Zone B). The hydraulic conductivities of Zone A/X reportedly ranged from  $3.5 \times 10^{-6}$  to  $3.8 \times 10^{-4}$  cm/sec, while those for Zone B ranged from  $1.2 \times 10^{-4}$  to  $7.5 \times 10^{-3}$  cm/sec. Zone A/X is classified in the APAR as a Class 3 groundwater resource and is not considered a reliable water resource. Zone B was classified in the APAR as a Class 2 groundwater resource and could be a reliable water resource; however, there are no groundwater receptors or production wells located downgradient of the Ash Ponds. Based on the findings of the TCEQ-approved APAR, Zone B is considered the uppermost aquifer in the Ash Pond Area.

**NOD Item No. 13**

*Revise the post-closure cost estimates in the referenced tables to include the dollar year in which the estimates were made (i.e., 2024 dollars).*

**Response:**

The updated post-closure care cost estimates are included in Attachment 8.

**NOD Item No. 14**

*In the NOD response letter, the response column refers to CCR registration No. CCR-106 numerous times; however, the Martin Lake CCR Facility is designated as CCR-105. Please revise the letter and make the necessary corrections.*

**Response:**

The revised pages from the NOD 3 document are included in Attachment 9.

**NOD Item No. 10(2)**

*Address in the Slope Stability Analysis Section, as required in NOD 3, dated 02/27/2024. The following issues were not fully addressed for A-1 Landfill.*

*Slope Stability Analysis Section (Section 2.4: Slope Stability – A1 Area Landfill Cap/Cover System):*

*Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).*

**Response:**

Section 2.4 of the Closure Plan Addendum No. 1 has been updated to include the requested statement. The revised document page is provided in Attachment 10.

**NOD Item No. 12(2)**

*Address in the Settlement Analysis Section (2.3 Settling and Subsidence - Cap/Cover System), as required in NOD 3, dated 02/27/2024. The following issue was not addressed in the NOD 3 response. Settlement Analysis Section:*

*Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that site 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).*

**Response:**

Section 2.3 of the Closure Plan Addendum No. 1 has been updated to include the requested statement. The revised document page is provided in Attachment 10.

**2.0 REFERENCES**

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Bullock, Bennett & Associates, LLC (BBA), 2024. CCR Background Monitoring and Statistical Analysis Summary Report. PDP-5, Martin Lake Steam Electric Station, Rusk County, Texas. February 26.

Bullock, Bennett & Associates, LLC (BBA), 2025a. CCR 2024 Annual Groundwater Monitoring and Corrective Action Report, A1 Area Landfill, Martin Lake Steam Electric Station, Panola County, Texas. January 31.

Bullock, Bennett & Associates, LLC (BBA), 2025b. CCR 2024 Annual Groundwater Monitoring and Corrective Action Report, Permanent Disposal Pond 5, Martin Lake Steam Electric Station, Rusk County, Texas. January 31.

Bullock, Bennett & Associates, LLC (BBA), 2025c. CCR 2024 Annual Groundwater Monitoring and Corrective Action Report, Ash Pond Area, Martin Lake Steam Electric Station, Rusk County, Texas. January 31.

Bureau of Economic Geology (BEG) and INTERRA, Inc., 2019. Fresh, Brackish, and Saline Groundwater Resources in the Carrizo-Wilcox, Queen City and Sparta Aquifers in Groundwater Management Area 13 – Location, Quantification, Producibility, and Impacts. Texas Water Development Board Contract No. 1548301855. April.

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Pastor, Behling & Wheeler, LLC (PBW), 2014. Affected Property Assessment Report, Martin Lake Steam Electric Station, Permanent Disposal Pond Area.

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Pastor, Behling & Wheeler, LLC (PBW), 2017b. CCR Rule Groundwater Monitoring System Certification – PDP 5, Martin Lake Steam Electric Station, Rusk County, Texas.

Pastor, Behling & Wheeler, LLC (PBW), 2017c. CCR Rule Groundwater Monitoring System Certification – Ash Pond Area, Martin Lake Steam Electric Station, Rusk County, Texas.

Texas Commission on Environmental Quality (TCEQ), 2011. Approval of Addendum to Revised APAR for Ash Ponds Area, and PBW, October 20, 2011 Response Letter and November 28, 2011 Email, Luminant Power Martin Lake Steam Electric Station. December 1.

Texas Commission on Environmental Quality (TCEQ), 2025. Tier 1 Protective Concentration Levels.

United States Environmental Protection Agency (EPA), 2007a. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 1. Technical Basis for Assessment. EPA/600/R-07/139.

United States Environmental Protection Agency (EPA), 2007b. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2. Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. EPA/600/R-07/140.

United States Environmental Protection Agency (EPA), 2009. Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, EPA 530-R-09-007, March.

United States Environmental Protection Agency (EPA), 2025. EPA Region 6 Technical Response to Martin Lake Document Submittals for the PDP 5 Surface Impoundment, Martin Lake Generating Station, Tatum, Texas.



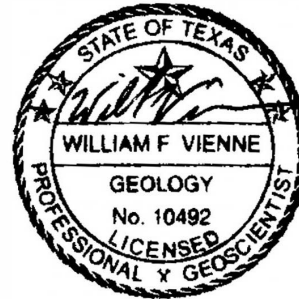
### 3.0 SIGNATURE PAGE

**BULLOCK, BENNETT & ASSOCIATES, LLC**



William Vienne, P.G. (TX 82596)  
*Senior Hydrogeologist*

Engineering Firm Registration: F-8542  
Geoscience Firm Registration: 50127



11/25/2025

Attachments



**ATTACHMENT 1**

**TCEQ's Addendum to the 3<sup>rd</sup> NOD Dated October 1, 2025**

Subject: Addendum to 3rd NOD - New Registration - Luminant Generation Company LLC - Registration No. CCR105

Luminant Generation Company LLC - Tatum, Rusk County, Texas  
Martin Lake Steam Electric Station  
New Coal Combustion Residuals (CCR) Registration No. CCR105  
Industrial Solid Waste Registration No. 31277  
EPA Identification No. TXD000821306  
Tracking No. 27220868; RN102583093/CN603256413

Dear Ms. Collins:

The Industrial and Hazardous Waste Permits Section staff of the Texas Commission on Environmental Quality (TCEQ) reviewed your new registration application dated January 21, 2022, and the revisions dated May 25, 2022, and December 15, 2022. Our review of the application indicates that additional information must be presented to demonstrate compliance with Title 30 Texas Administrative Code (TAC) Chapters 305 and 352.

The deficiencies noted in the below table follow the format of the TCEQ CCR Registration application form. Each deficiency is uniquely identified in the below table and requires your response. Please note, when providing your response, you must:

1. Refer to the unique deficiency identifier;
2. Include the location in the registration application where your response requires revisions or where you provide additional information;
3. Include any other narrative necessary to explain your response;
4. If possible, provide a redline/strikeout version clearly identifying all proposed changes to the registration application;
5. Include replacement pages for insertion into the application. Each replacement page should contain a revision date and revision number; and
6. If a revision to the application causes text to shift and/or pagination to change, please provide all pages affected by the revision(s).

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                   | Citation                                                          | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1               | VI           | VI.27. B         | [Appendix F<br>2022<br>Groundwater<br>Monitoring<br>System<br>Certification<br>Addendum No. 1<br>A1 Landfill Area]<br>(.pdf pgs. 11-14) | <a href="#">40 CFR §257.94</a><br><a href="#">30 TAC §352.911</a> | Provide North-South and East-West geological cross sections across the landfill down to the bedrock and beyond the boundary of the mine spoils showing the local subsurface geology in the vicinity of the landfill along with the projected nearest wells to the cross sections. Also, provide the maximum and minimum historical groundwater levels on the monitoring wells in the cross sections. |

<sup>1</sup> Deficiency ID – Key: Use this numbered ID to identify the NOD response.

<sup>2</sup> Location of deficiency in submittal/application. Items in square brackets [ ] refer to applicant’s supplemental information submitted as attachments/appendices to the application form.

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                                                                                                                                                                  | Citation                                                             | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------|--------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2               | VI           | VI.27.D          | <p>Appendix F<br/>2024 Annual Groundwater and Corrective Action Report<br/>A-1 Area Landfill<br/>January 31, 2025<br/>(.pdf pgs. 267-269)</p> <hr/> <p>[2017 CCR Rule Groundwater Monitoring System Certification<br/>MLSES-A1 Landfill<br/>October 16, 2017]<br/>(pdf pgs. 42-51)</p> | <a href="#">40 CFR §257.91(c)</a><br><a href="#">30 TAC §352.911</a> | A1 Landfill: Provide a narrative, with site-specific technical information, on the method that was used to determine the well spacing of the landfill groundwater monitoring system and how the monitoring system can capture all potential contaminant pathways from the landfill. For example, explain how potential contaminants can be captured in the area where the potentiometric surface map indicates a groundwater flow direction towards the south and west of the facility. |
| 3               |              |                  | <p>EPA Notice Letter - RCRA<br/>February 4, 2025</p>                                                                                                                                                                                                                                   | <a href="#">40 CFR §257.107(h)(7)</a>                                | <p>A1 Landfill:</p> <p>Post on the public website the '2019-Martin Lake-SWR 31277-Corrective Measures Assessment ML Landfill.pdf' on the 2019 Martin Lake CCR website (as has been done for the Ash Pond Area).</p>                                                                                                                                                                                                                                                                     |

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                                                                                                                                               | Citation                                                               | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|--------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4               | VI           | VI.27            | EPA Notice Letter<br>- RCRA<br>February 4, 2025<br><hr/> [Appendix F<br>Coal Combustion<br>Residual Rule<br>Background<br>Groundwater<br>Monitoring and<br>Statistical<br>Analysis<br>Summary Report<br>(.pdf pg. 511)<br>A1 Area Landfill]<br>February 26,<br>2024 | <a href="#">40 CFR §257.91(a)</a><br><a href="#">40 CFR §257.91(c)</a> | A1 Landfill:<br>Provide a site-specific technical justification explaining the use of well BMW-11A-R as the background well for the A1 Area Landfill CCR Unit. For example: <ol style="list-style-type: none"> <li>1. Provide additional 'background' groundwater quality for comparison, or</li> <li>2. Provide additional discussion on alternative statistical methods used to address the EPA comment from the Notice Letter dated Feb. 4, 2025. Section 2.4 (.pdf p. 511) and Appendix C (.pdf pages 1498-1506) of the CCRRBGMandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the interwell statistical method, which uses the background well groundwater quality, and therefore, the 'background nature' of well BMW-11A-R comes into question.</li> </ol> |
| 5               | VI           | VI.27            | EPA Notice Letter<br>- RCRA<br>February 4, 2025                                                                                                                                                                                                                     | <a href="#">40 CFR §257.91(a)</a><br><a href="#">40 CFR §257.91(c)</a> | PDP5:<br>Please provide a narrative that addresses the fact there is no true background well because of groundwater mounding and radial groundwater flow centered on well MW-18A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                                       | Citation                             | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------|--------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6               | VI           | VI.27            | CCR Rule Background GW Monitoring and Statistical Analysis Summary Report February 26, 2024<br>(.pdf pg. 2275)<br>EPA Notice Letter - RCRA February 4, 2025 | <a href="#">40 CFR §257.93(h)(1)</a> | PDP-5 Area:<br><br>Provide additional narrative explaining the use of intrawell data evaluation statistical analysis method used in Surface Impoundment PDP 5, groundwater monitoring systems at the Martin Lake CCR Unit.<br><br>Section 2.4 (.pdf p. 2275) and Appendix C (.pdf pages 2997-3006) of the CCRRBGMandSAS Report (2/26/24) within Appendix F, Revision 2 (dated February 27, 2024) discusses the use of the intrawell statistical method.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 7               | VI           | VI.27.B          | [Appendix F, GWM System Certification – Addendum No. 1 PDP-5 December 2022, Figures 3 and 4 PDP 5]<br>(pdf pgs. 9-10)                                       | <a href="#">40 CFR §257.94</a>       | <ol style="list-style-type: none"> <li>1. Update the geological cross sections across the PDP-5 Surface Impoundment (and the closed PDPs-1, 2 and 3) (A-A' and B-B') to include other nearby wells to extend the subsurface geology beyond the unit boundary. Also include the historical highest and lowest groundwater levels at each additional well added to the cross section.</li> <li>2. PDP 5: Provide a narrative explaining the groundwater table elevations that occur above the base of the closed units, within the closed middle portion of PDP 1, 2, and 3. The PDP-5 Addendum 1 includes two cross sections across the PDP 5 Impoundment (A-A' and B-B'). The cross sections include historical maximum and minimum groundwater elevations on wells MW-20A and MW-18A on A-A' and wells PDP-25 and MW-19 on B-B.' The groundwater table elevations occur above the base of closed units: PDP-1, PDP-2, and PDP-3.</li> </ol> |

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                             | Citation                          | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|--------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8               | VI           | VI.28            | Coal Combustion Residual Rule<br>2024 Annual Groundwater and Corrective Action Report<br><br>Attachment 1<br>January 31, 2025<br>(pdf pgs. 42-43) | <a href="#">40 CFR §257.94</a>    | PDP-5 Area:<br><br>Provide a narrative explaining the historical variation of the potentiometric contours including the radial groundwater flow direction in the PDP-5 Area. Use all of the wells in the groundwater monitoring system and any non-CCR wells available in the surrounding areas for construction of the potentiometric surface contours or explain why those wells are excluded. (The initial maps in 2017 and map year October 4, 2021, shows four flow directions (radial) and map year 2024 shows 2 flow directions). Overall, the facility shows radial flow. Provide a groundwater monitoring system that has a sufficient number of wells and a well spacing adequate to monitor any downward and/or lateral movement of potential contaminants in all directions due to radial flow, see comment 3 above. |
| 9               | VI           | VI.29            | Alternate Source Demonstration<br>2024<br><br>MLSES - PDP 5<br>March 8, 2024<br>(pdf pg. 3)                                                       | <a href="#">40 CFR §257.94(e)</a> | <ol style="list-style-type: none"> <li>1. Provide additional water quality data from nearby wells or previous studies that indicate similar concentrations for SSI constituents to support the natural-source explanation within the ASD.</li> <li>2. Provide the location of the ASD-referenced sampled wells (distance and direction) in the Sabine uplift area in Texas, as cited in Texas Bureau of Economic Geology report (1991) as stated in the ASD submission.</li> </ol>                                                                                                                                                                                                                                                                                                                                               |



| ID<br><sup>1</sup> | App.<br>Section | App. Sub<br>Section | Location <sup>2</sup>                                                                                                                                                 | Citation                                                          | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-----------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10                 | VI              | VI.27.B             | [Appendix F<br>Coal Combustion<br>Residual Rule<br>Groundwater<br>Monitoring<br>System<br>Certification<br>MLSES - Ash Pond<br>October 16, 2017]<br>(pdf pg. 21)      | <a href="#">40 CFR §257.91</a><br><a href="#">30 TAC §352.911</a> | <ol style="list-style-type: none"> <li>1. Update the (C-C') Cross Section in Appendix F - Ash Pond with the historical maximum and minimum groundwater levels and trace the bottom of the three Ash Pond Units on the cross section (as in CCR Assessment of Corrective Measures Report, September 2019, pdf pg. 37) showing the geological formations and the separation between the groundwater table and the bottom of the Ash Ponds.</li> <li>2. The Groundwater Monitoring Report 2021 shows a North and Northeast (NE) groundwater flow direction, a North NE to NE direction in 2022, and a NE direction again in 2023 and 2024.</li> </ol> <p>Address the following:</p> <ol style="list-style-type: none"> <li>a. Justify the well spacing in the Ash Pond area in the down-gradient direction.</li> <li>b. Justify how the present groundwater monitoring well network can detect any release of potential contaminants from the Ash Pond area based upon the existing number of wells and well spacing.</li> </ol> |
| 11                 | VI              | VI.27.B             | [Appendix F<br>Coal Combustion<br>Residual Rule<br>Groundwater<br>Monitoring<br>System<br>Certification<br>MLSES - Ash Pond<br>October 16, 2017]<br>(pdf pgs. 21, 23) | <a href="#">40 CFR §257.93(a)</a>                                 | <p>Provide information on using H-26, H-27, and H-33 as background wells as the groundwater may be affected by the operations of the facility (e.g. coal piles) to the west, which is upgradient (based on applicant-supplied groundwater flow maps) to these background wells. This may be based upon:</p> <ol style="list-style-type: none"> <li>1. Groundwater or other monitoring data to substantiate the 'background' quality of these three upgradient, background wells.</li> <li>2. Additionally, include any geotechnical analyses of the 'ML' lithologic unit that may indicate a low-flow boundary or 'isolation' of the lower sand body, in which the background wells are completed (as indicated in Cross Section C-C'), from the operations of the facility (e.g. coal piles).</li> </ol>                                                                                                                                                                                                                     |

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                      | Citation                                                          | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|--------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12              | VI           | VI.27.B          | [CCR Assessment of Corrective Measures Report<br>Ash Pond Area]<br>September 2019<br>(pdf pgs. 37-38)                                      | <a href="#">40 CFR §257.91</a><br><a href="#">30 TAC §352.911</a> | Cross section C-C' (Groundwater Monitoring System Certification Report, October 16, 2017, pg. 21) illustrates that the Ash Pond(s) monitoring wells are completed into the lower sand lithologic unit. This sand unit is partially isolated by a clay lithologic unit in the eastern three-quarters of the Ash Pond Management Unit. Cross section C-C' from the CCR Assessment of Corrective Measures Report (September 2019) illustrates that the three surface impoundments lie, either partially or wholly, within the upper sand lithologic unit.<br><br>Justify how no monitoring wells were completed within the upper sand unit at least in the portions of the Ash Pond Management Unit that are underlain by the 'isolating' clay unit. |
| 13              | VIII         | VIII.33          | [Appendix H (Revision 2) - Financial Assurance, Post-Closure Care Cost Estimate<br>Tables 1, 2 & 3<br>February 27, 2024]<br>(pdf pgs. 6-8) | <a href="#">30 TAC §352.1101(b)</a>                               | Revise the post-closure cost estimates in the referenced tables to include the dollar year in which the estimates were made (i.e., 2024 dollars).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 14              | N/A          | N/A              | NOD 3 Response Letter<br>Dated 2/27/2024                                                                                                   |                                                                   | In the NOD response letter, the response column refers to CCR registration No. CCR-106 numerous times; however, the Martin Lake CCR Facility is designated as CCR-105. Please revise the letter and make the necessary corrections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| ID <sup>1</sup> | App. Section | App. Sub Section | Location <sup>2</sup>                                                                                                                                                                                      | Citation                                                                                                           | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|--------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10<br>(2)       | VII          | VII.31           | [Appendix G<br>Closure Plan<br>Addendum 1<br>MLSES -<br>A1 Area Landfill]<br>December 2022<br>(.pdf pg. 80, 85)                                                                                            | <a href="#">40 CFR §257.102(d)(1)(iii)</a>                                                                         | Address in the Slope Stability Analysis Section, as required in NOD 3, dated 02/27/2024. The following issues were not fully addressed for A-1 Landfill.<br><br>Slope Stability Analysis Section (Section 2.4: Slope Stability - A1 Area Landfill Cap/Cover System):<br><br>Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable). |
| 12<br>(2)       | VII          | VII.31           | [Appendix G<br>Closure Plan<br>Addendum 1<br>for A1 Area<br>Landfill, Ash<br>Pond Area, and<br>PDP-5]<br>(A1 .pdf pg. 85,<br>92)<br><br>(Ash Pond .pdf<br>pg. 214, 219)<br><br>(PDP5 .pdf pg.<br>355, 359) | <a href="#">30 TAC §352.4</a><br><a href="#">40 CFR §257.102(b)</a><br><a href="#">40 CFR §257.102(d)(3)(i)(D)</a> | Address in the Settlement Analysis Section (2.3 Settling and Subsidence - Cap/Cover System), as required in NOD 3, dated 02/27/2024. The following issue was not addressed in the NOD 3 response. Settlement Analysis Section:<br><br>Provide a statement indicating that an amendment will be submitted prior to construction for review and approval. The statement shall also indicate that site 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).                                       |

<sup>1</sup> Deficiency ID – Key: Use this numbered ID to identify the NOD response.

<sup>2</sup> Location of deficiency in submittal/application. Items in square brackets [ ] refer to applicant's supplemental information submitted as attachments/appendices to the application form.

Please submit your response (an unmarked copy and marked copy, for example in redline/strikeout format) via email for our review within 30 days of the date of this email. Please do not hesitate to contact me if you have any questions.

At the completion of the technical review, a complete NOD response package, which includes **all** NOD responses, **must be sent as a paper copy to IHW including an original signature page(s).**

**Note:** All confidential NOD response materials (paper or email) must be labeled as CONFIDENTIAL, contain **only** confidential materials **and must be submitted separately**. Do not submit **confidential and non-confidential information** in the same email. If TCEQ receives an email containing both confidential and non-confidential documents, the email will not be treated as confidential. **Applicants must mark each individual confidential page as confidential at the bottom of the page.**

Sincerely,

Pradeep Patel, P.G., Project Manager  
Industrial and Hazardous Waste Permits Section  
Waste Permits Division  
Texas Commission on Environmental Quality

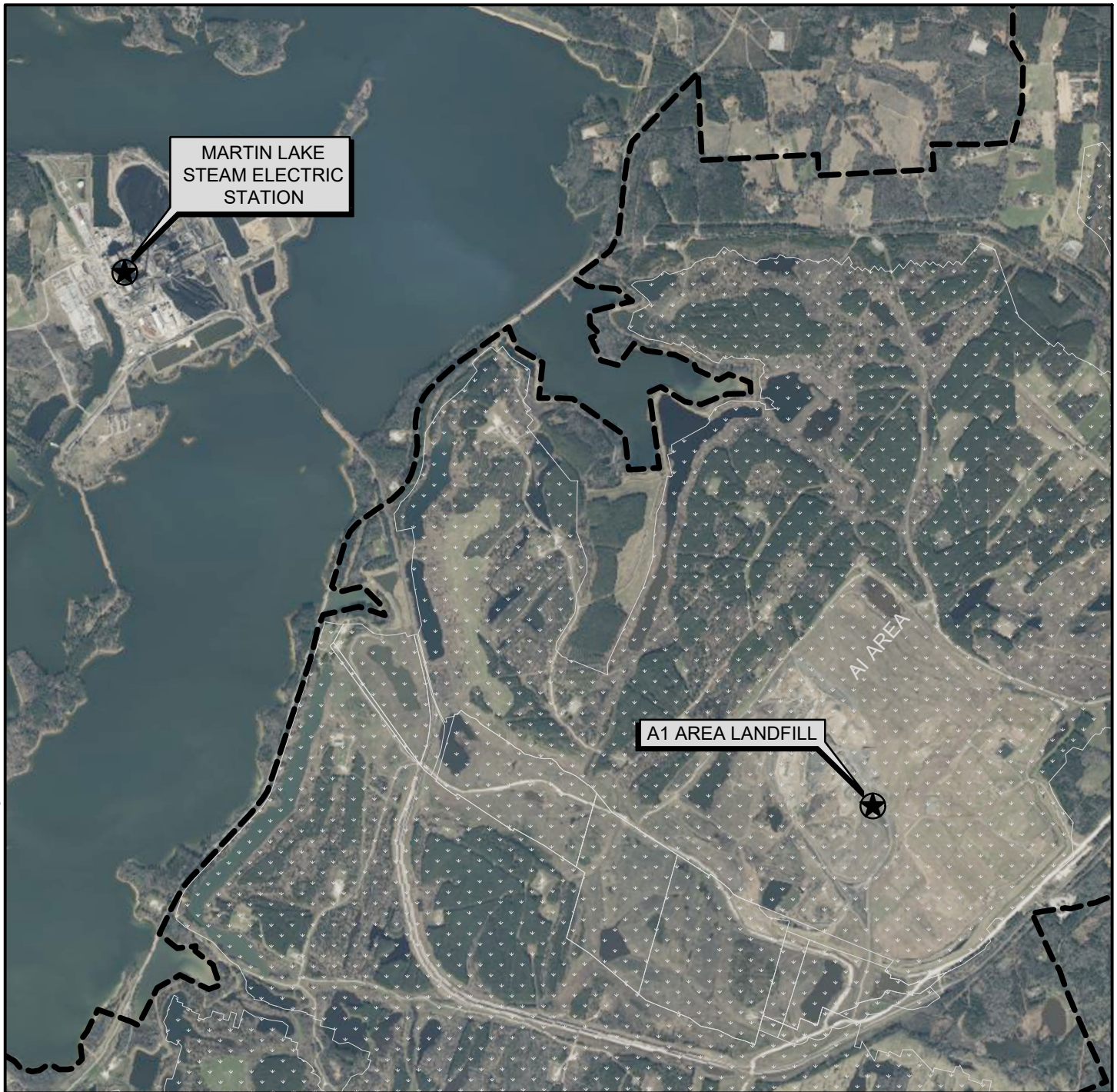
To: Renee Collins, Send electronically to [renee.collins@luminant.com](mailto:renee.collins@luminant.com)  
cc: Eric Chavers, Send electronically to [eric.chavers@luminant.com](mailto:eric.chavers@luminant.com)

bcc: Michelle Baetz, TCEQ Region 5, Send to [TylerWaste@tceq.texas.gov](mailto:TylerWaste@tceq.texas.gov)  
Charles Brown, P.G., Work Leader, TCEQ IHW Permits Section, Waste Permits Division MC 130 – Austin  
[Charles.Brown@tceq.texas.gov](mailto:Charles.Brown@tceq.texas.gov)  
Pradeep Patel, P.G., Project Manager, TCEQ IHW Permits Section, Waste Permits Division MC 130 – Austin  
[Pradeep.Patel@tceq.texas.gov](mailto:Pradeep.Patel@tceq.texas.gov)  
Lance Christian, P.G., Project Manager, TCEQ IHW Permits Section, Waste Permits Division MC 130 – Austin  
[Lance.Christian@tceq.texas.gov](mailto:Lance.Christian@tceq.texas.gov)  
Daniela Ortiz de Montellano, Team Leader, TCEQ IHW Permits Section, Waste Permits Division MC 130 – Austin [Daniela.Ortiz-demontellano@tceq.texas.gov](mailto:Daniela.Ortiz-demontellano@tceq.texas.gov)  
[DataEntry-WPD@tceq.texas.gov](mailto:DataEntry-WPD@tceq.texas.gov)

**ATTACHMENT 2**

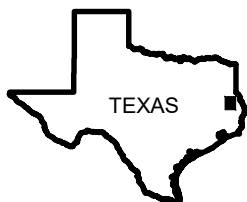
**A1 Area Landfill Cross Sections and Associated Figures**



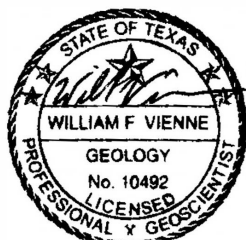


# LEGEND

- MARTIN LAKE LIGNITE MINE PERMIT BOUNDARY
- MINED OUT AREA



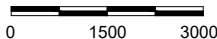
QUADRANGLE LOCATION



11/25/2025



Scale in Feet



Aerial Source:  
2025 Microsoft Corporation; 2025 Maxar; CNES 2025 Distribution Airbus DS;  
2025 TMAP Mobility Earthstar Geographics SIO

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 1

## SITE LOCAITON MAP

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

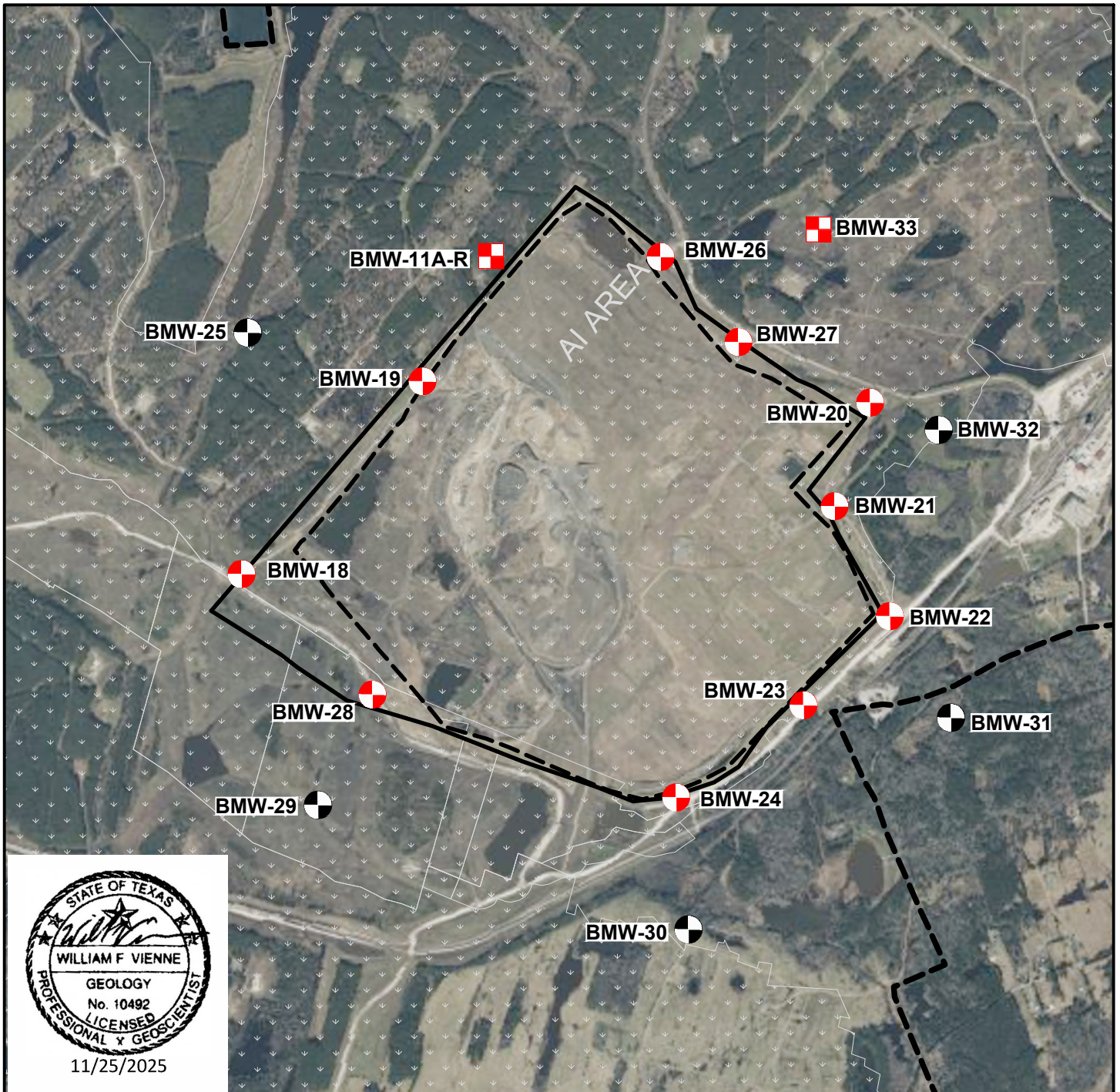
Bullock, Bennett & Associates, LLC

Engineering and Geoscience

Texas Registrations: Engineering F-8542, Geoscience 50127



Plot Date: 11/17/25 - 3:16pm, Plotted by: thigh  
Drawing Path: C:\Users\thigh\OneDrive\Drawings\25\061301, Drawing Name: Martin Lake Steam Electric sections 25-1117.dwg

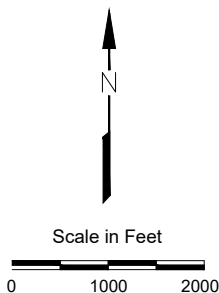


#### LEGEND

-  MINED OUT AREA
-  MARTIN LAKE LIGNITE MINE PERMIT BOUNDARY
-  DEED RESTRICTION BOUNDARY
-  WASTE BOUNDARY
-  DOWNGRADIENT CCR MONITORING WELL
-  UPGRADIENT CCR MONITORING WELL
-  CCR DELINEATION WELL

#### NOTE(S):

1. EXTENT OF MINED OUT AREAS WAS TAKEN FROM THE 1993 MINING PERMIT FOR THE BECKVILLE MINE AND SHOULD BE CONSIDERED APPROXIMATE.



#### Aerial Source:

2025 Microsoft Corporation; 2025 Maxar; CNES 2025 Distribution  
Airbus DS; 2025 TMAP Mobility Earthstar Geographics SIO

### MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

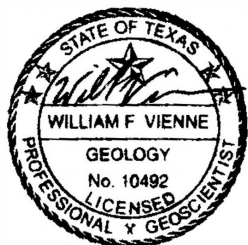
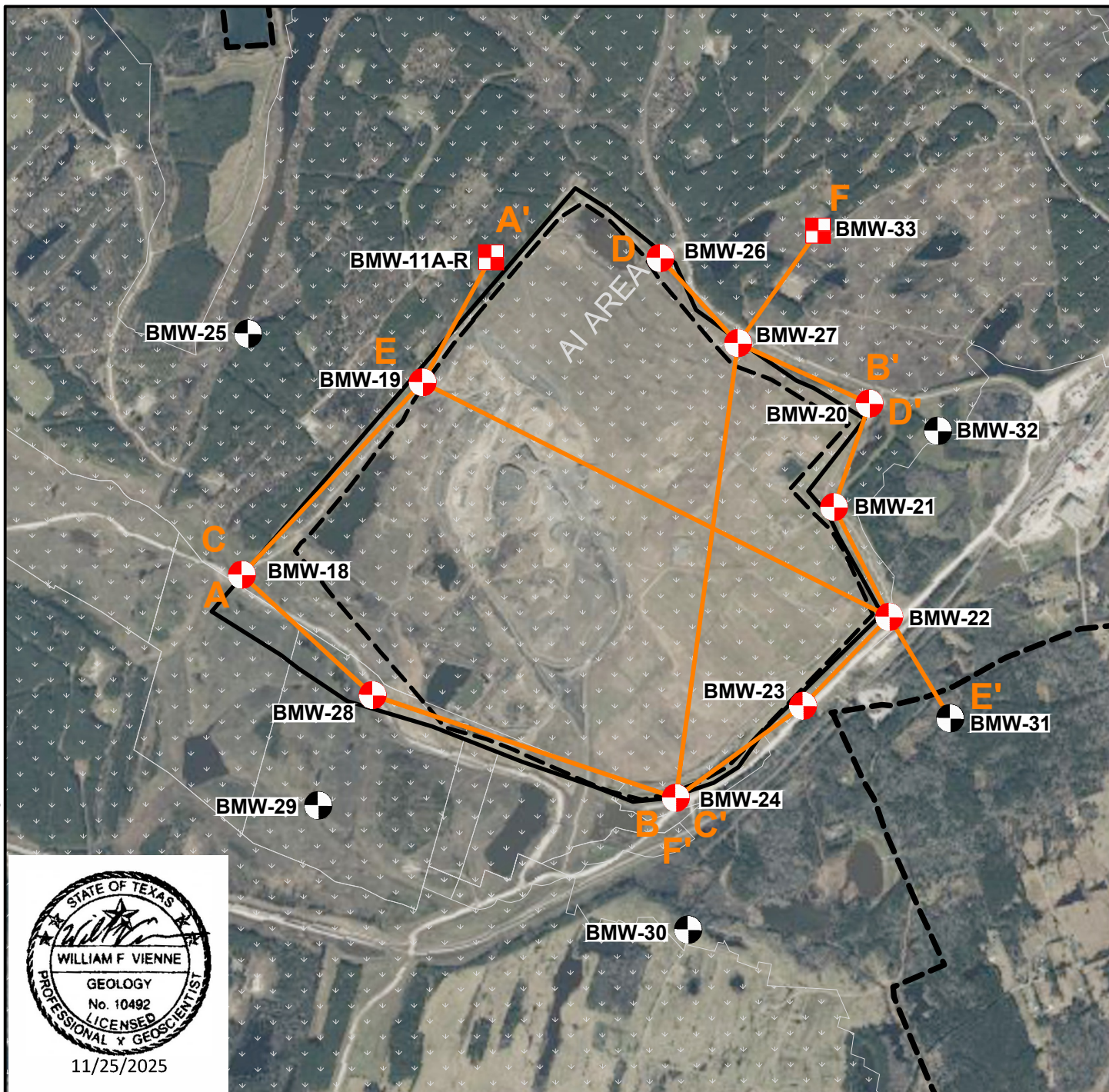
## Figure 2 DETAILED SITE PLAN A1 AREA LANDFILL

PROJECT: 23643V-32 | BY: HLS | DATE: NOV. 2025 | CHECKED: WV

**Bullock, Bennett & Associates, LLC**  
Engineering and Geoscience  
Texas Registrations: Engineering F-8542, Geoscience 50127



Plot Date: 11/17/25 - 3:16pm, Plotted by: thigh  
Drawing Path: C:\Users\thigh\OneDrive\Drawings\25\06\130\, Drawing Name: Martin Lake Steam Electric sections 25-1117.dwg



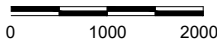
#### LEGEND

- MINED OUT AREA
- MARTIN LAKE LIGNITE MINE PERMIT BOUNDARY
- DEED RESTRICTION BOUNDARY
- WASTE BOUNDARY
- DOWNGRADIENT CCR MONITORING WELL
- UPGRADIENT CCR MONITORING WELL
- CCR DELINEATION WELL
- CROSS SECTION LOCATION

#### NOTE(S):

1. EXTENT OF MINED OUT AREAS WAS TAKEN FROM THE 1993 MINING PERMIT FOR THE BECKVILLE MINE AND SHOULD BE CONSIDERED APPROXIMATE.

Scale in Feet



#### Aerial Source:

2025 Microsoft Corporation; 2025 Maxar; CNES 2025 Distribution  
Airbus DS; 2025 TMAP Mobility Earthstar Geographics SIO

### MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

### Figure 3 A1 AREA LANDFILL CROSS SECTION LOCATION MAP

PROJECT: 23643V-32 | BY: HLS | DATE: NOV. 2025 | CHECKED: WV

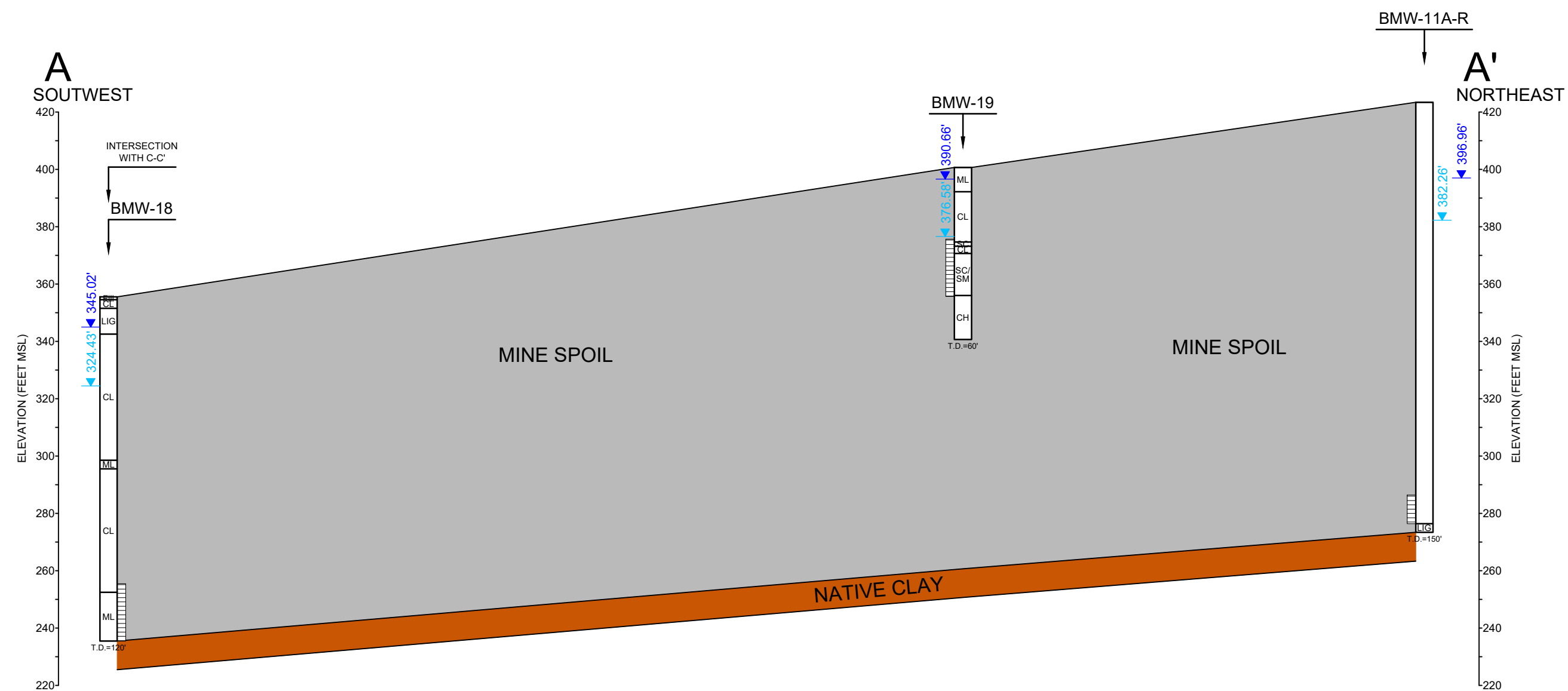
**Bullock, Bennett & Associates, LLC**  
Engineering and Geoscience  
Texas Registrations: Engineering F-8542, Geoscience 50127



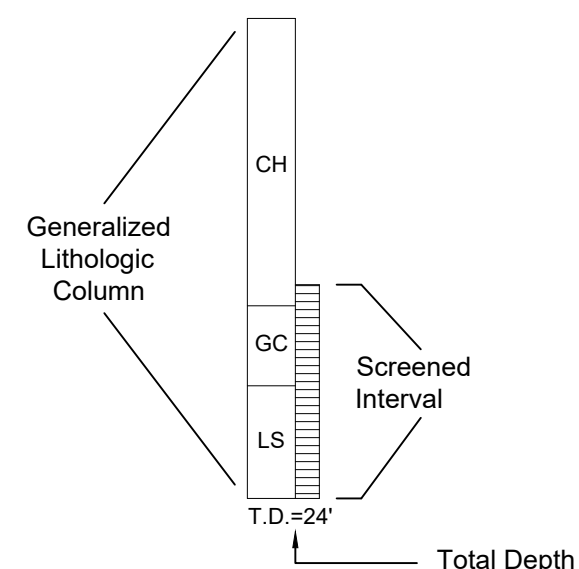
Plot Date: 11/17/25 - 3:17pm, Plotted by: thgh  
Drawing Path: C:\Users\thgh\OneDrive\Documents\25061301, Drawing Name: Martin Lake Steam Electric sections 25-1117.dwg

NOTES:

1. NOT FOR CONSTRUCTION.
2. MINE SPOIL/NATIVE CLAY CONTACTS ARE ESTIMATED BASED ON SOIL BORING INFORMATION.



MONITORING WELL CONSTRUCTION

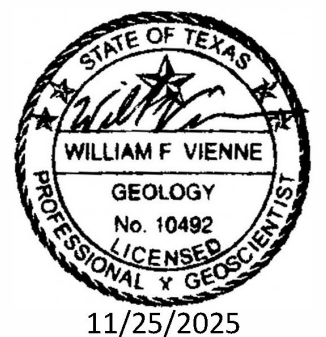
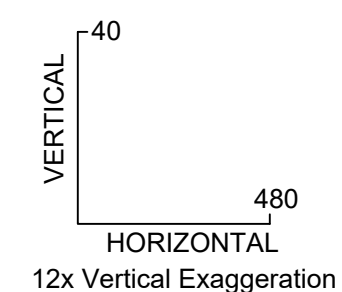


- ▼ Max. Observed Historical Water Level (Ft MSL)
- ▲ Min. Observed Historical Water Level (Ft MSL)

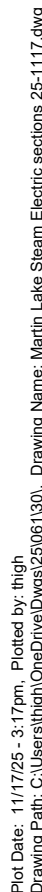
EXPLANATION

- SAND
- CLAY
- SILT
- SPOIL

SCALE IN FEET



| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| Figure 4                                                  |         |                 |             |
| AREA LANDFILL<br>GEOLOGIC CROSS SECTION A-A'              |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |



Generalized  
Lithologic  
Column

CH

GC

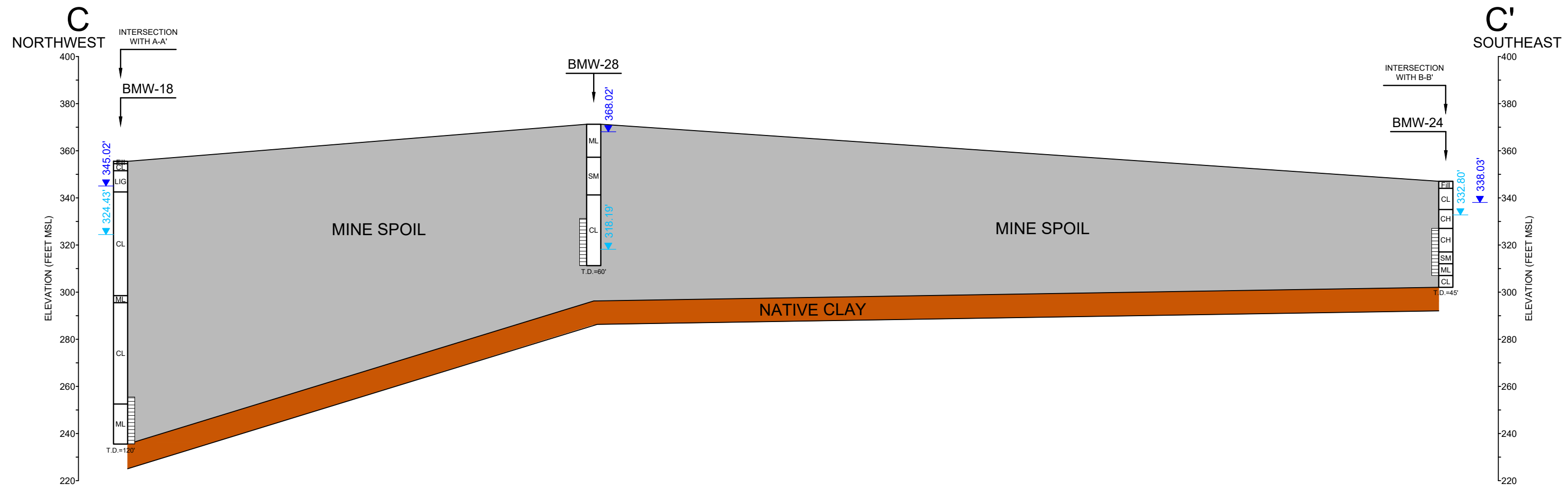
LS

Screened  
Interval

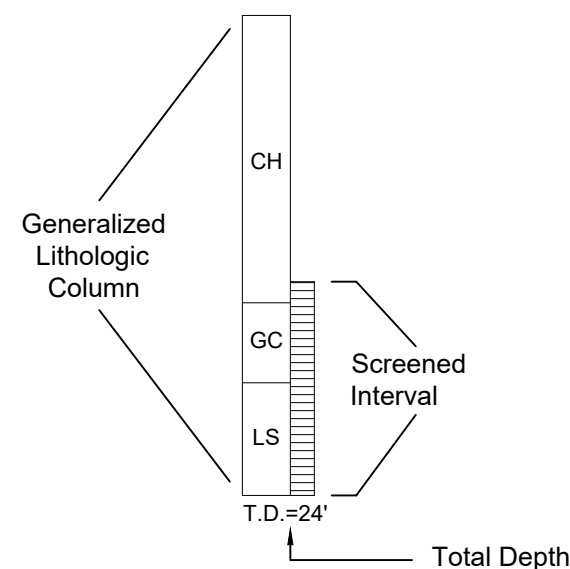
T.D.=24'

Total Depth

|                                                                                                                                                         |         |                 |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|-------------|
| <b>MARTIN LAKE STEAM ELECTRIC STATION</b>                                                                                                               |         |                 |             |
| <b>TATUM, TEXAS</b>                                                                                                                                     |         |                 |             |
| <p>Figure 5</p> <p><b>AREA LANDFILL</b></p> <p><b>GEOLOGIC CROSS SECTION B-B'</b></p>                                                                   |         |                 |             |
| PROJECT: 23643V-32                                                                                                                                      | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| <p><b>Bullock, Bennett &amp; Associates, LLC</b></p> <p>Engineering and Geoscience</p> <p>Texas Registrations: Engineering F-8542, Geoscience 50127</p> |         |                 |             |



#### MONITORING WELL CONSTRUCTION



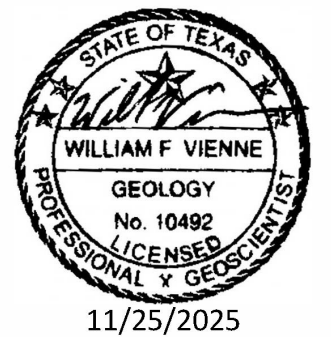
▼ Max. Observed Historical Water Level (Ft MSL)  
 ▲ Min. Observed Historical Water Level (Ft MSL)

#### EXPLANATION

SAND  
 CLAY  
 SILT  
 SPOIL

#### SCALE IN FEET

VERTICAL  
 HORIZONTAL  
 12x Vertical Exaggeration



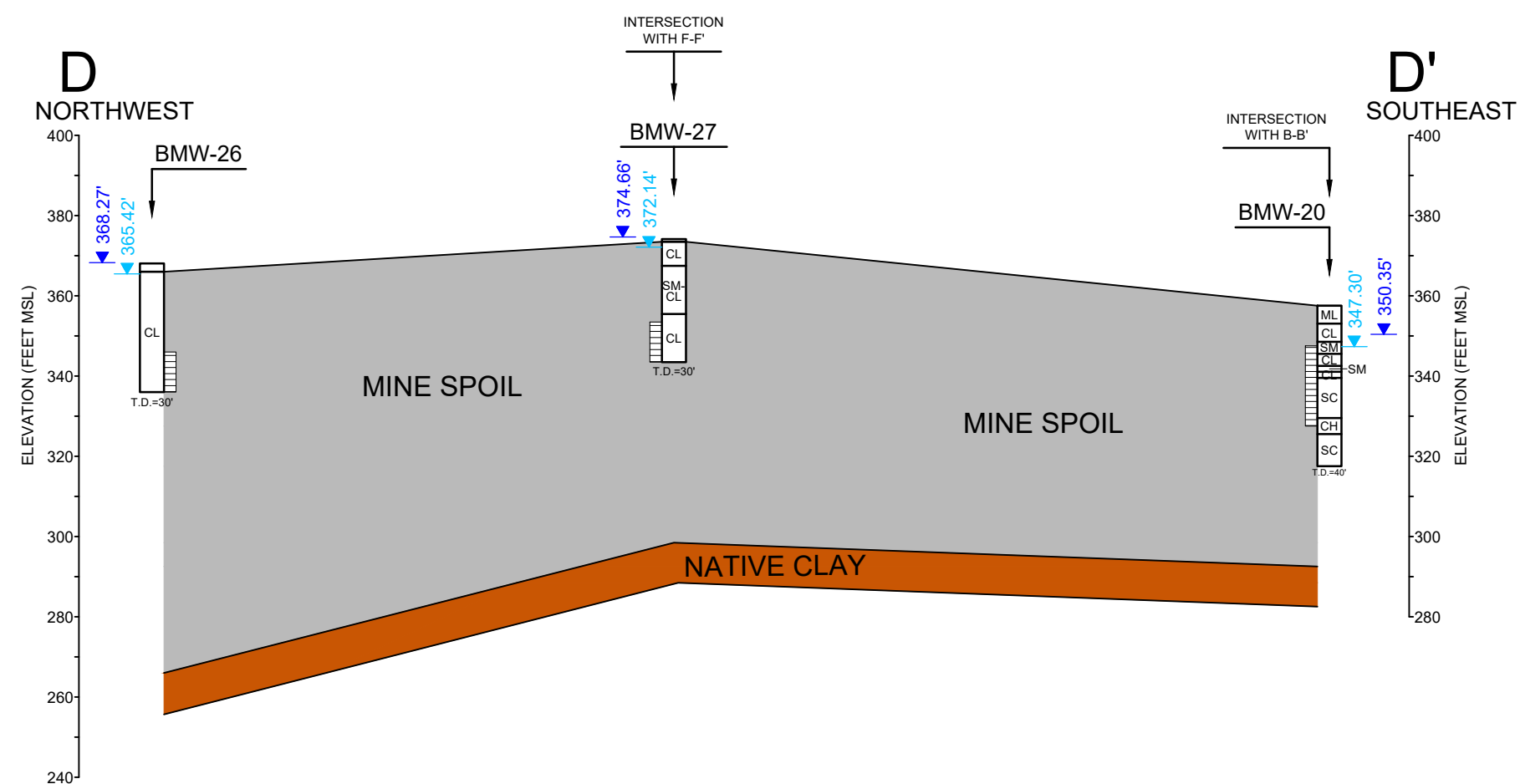
#### NOTES:

1. NOT FOR CONSTRUCTION.
2. MINE SPOIL/NATIVE CLAY CONTACTS ARE ESTIMATED BASED ON SOIL BORING INFORMATION.

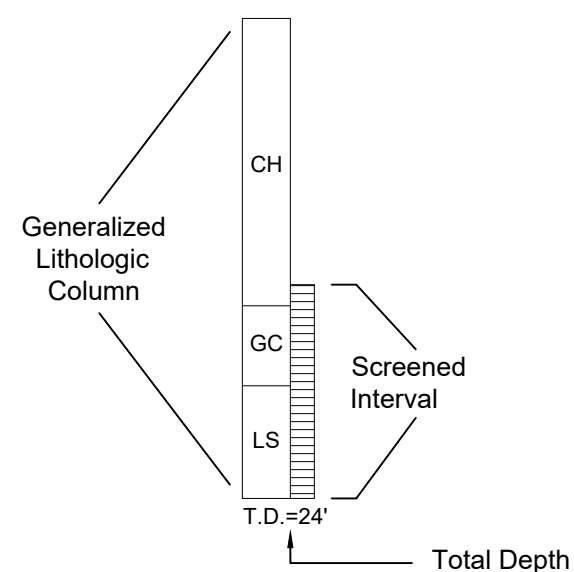
| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| Figure 6                                                  |         |                 |             |
| AREA LANDFILL<br>GEOLOGIC CROSS SECTION C-C'              |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |



Plot Date: 11/17/25 - 3:17pm, Plotted by: thgh  
Drawing Path: C:\Users\thgh\OneDrive\Documents\25061930, Drawing Name: Martin Lake Steam Electric sections 25-1117.dwg



#### MONITORING WELL CONSTRUCTION

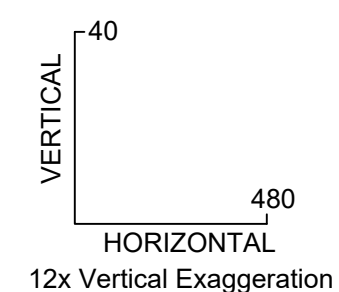


▼ Max. Observed Historical Water Level (Ft MSL)  
▲ Min. Observed Historical Water Level (Ft MSL)

#### EXPLANATION

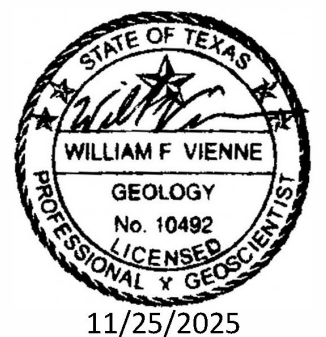
|  |       |
|--|-------|
|  | SAND  |
|  | CLAY  |
|  | SILT  |
|  | SPOIL |

#### SCALE IN FEET



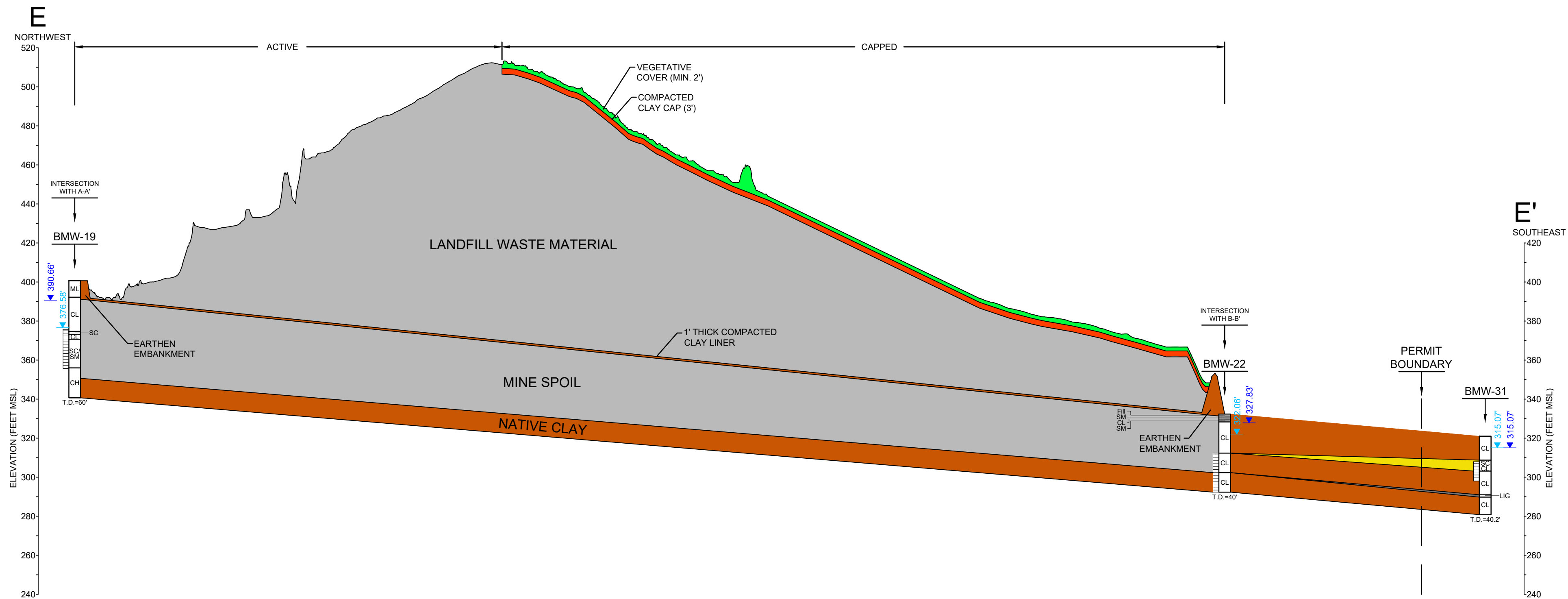
#### NOTES:

- NOT FOR CONSTRUCTION.
- MINE SPOIL/NATIVE CLAY CONTACTS ARE ESTIMATED BASED ON SOIL BORING INFORMATION.

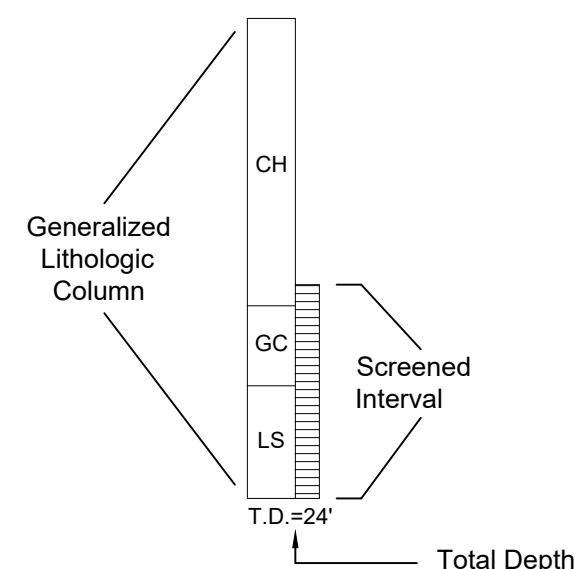


|                                                           |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
| Figure 7                                                  |         |                 |             |
| AREA LANDFILL<br>GEOLOGIC CROSS SECTION D-D'              |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |

Plot Date: 11/20/25 - 1:02pm, Plotted by: thgh  
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#### MONITORING WELL CONSTRUCTION



#### NOTES:

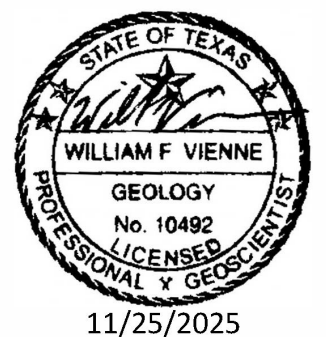
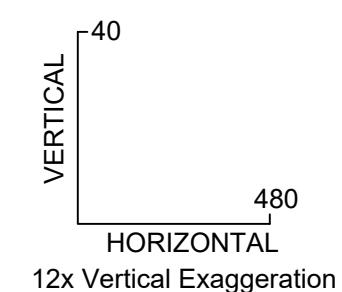
1. THE WATER LEVEL IN BMW-31 WAS ONLY MEASURED ONCE, DURING ASSESSMENT OF CORRECTIVE MEASURES (GOLDER, 2019.)
2. LANDFILL TOPOGRAPHY IS BASED ON 2021 AND 2025 SURVEYS PERFORMED BY SCS.
3. NOT FOR CONSTRUCTION.
4. LANDFILL/MINE SPOIL/NATIVE CLAY CONTACTS ARE ESTIMATED BASED ON SOIL BORING INFORMATION.
5. VEGETATIVE COVER, CLAY LINER, AND CLAY CAP ARE APPROXIMATE.

- ▼ Max. Observed Historical Water Level (Ft MSL)
- ▲ Min. Observed Historical Water Level (Ft MSL)

#### EXPLANATION

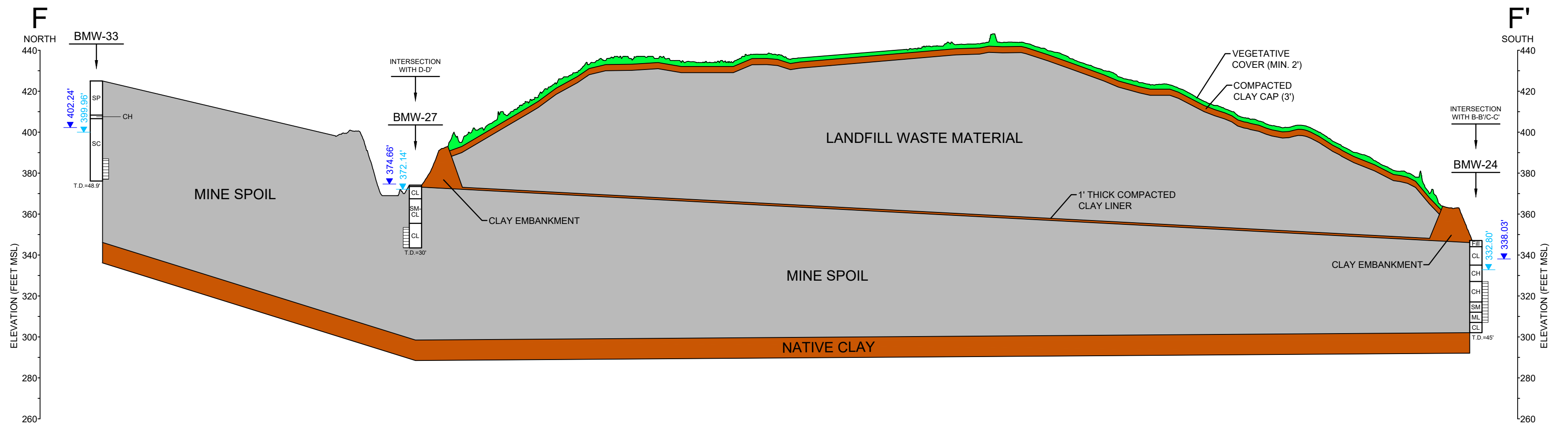
- SAND
- CLAY
- SILT
- SPOIL/WASTE

#### SCALE IN FEET

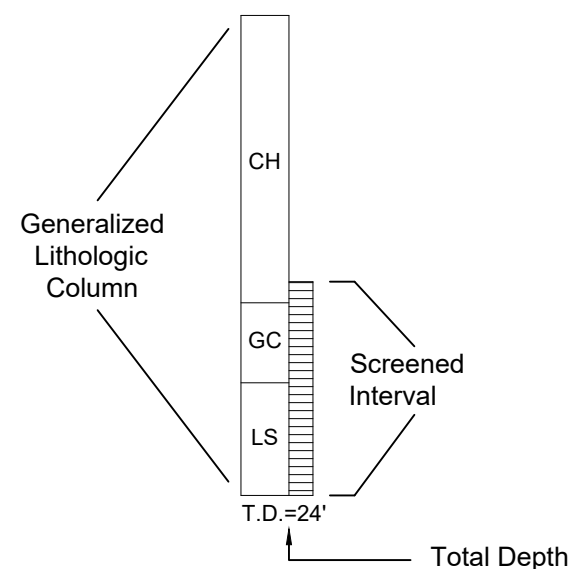


| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| Figure 8                                                  |         |                 |             |
| AREA LANDFILL<br>GEOLOGIC CROSS SECTION E-E'              |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |

Plot Date: 11/20/25 - 1:02pm, Plotted by: thgh  
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#### MONITORING WELL CONSTRUCTION

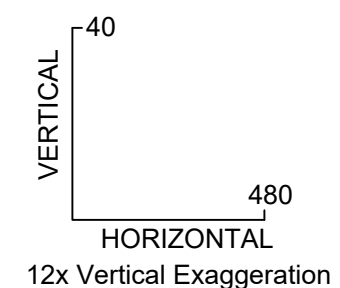


- ▼ Max. Observed Historical Water Level (Ft MSL)  
▲ Min. Observed Historical Water Level (Ft MSL)

#### EXPLANATION

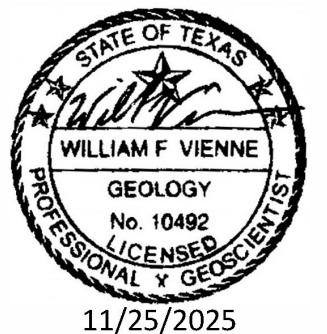
- SAND  
CLAY  
SILT  
SPOIL/WASTE

#### SCALE IN FEET



#### NOTES:

1. LANDFILL TOPOGRAPHY IS BASED ON 2021 AND 2025 SURVEYS PERFORMED BY SCS.
2. NOT FOR CONSTRUCTION.
3. LANDFILL/MINE SPOIL/NATIVE CLAY CONTACTS ARE ESTIMATED BASED ON SOIL BORING INFORMATION.
4. VEGETATIVE COVER, CLAY LINER, AND CLAY CAP ARE APPROXIMATE.

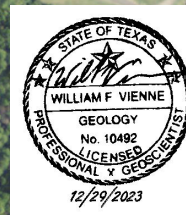


| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| Figure 9                                                  |         |                 |             |
| AREA LANDFILL<br>GEOLOGIC CROSS SECTION F-F'              |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |



**ATTACHMENT 3**

**PDP-5 Groundwater Potentiometric Surface Maps - Background Period**



## EXPLANATION



CCR Monitoring Well Location



Non-CCR Monitoring Well  
Used to Further Evaluate  
Groundwater Flow Direction

(374.34) Groundwater Potentiometric  
Surface (ft. MSL)

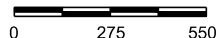
— 360 — Groundwater Potentiometric  
Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet



SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 1

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP OCTOBER 20, 2015

PROJECT: 5164B

BY: AJD

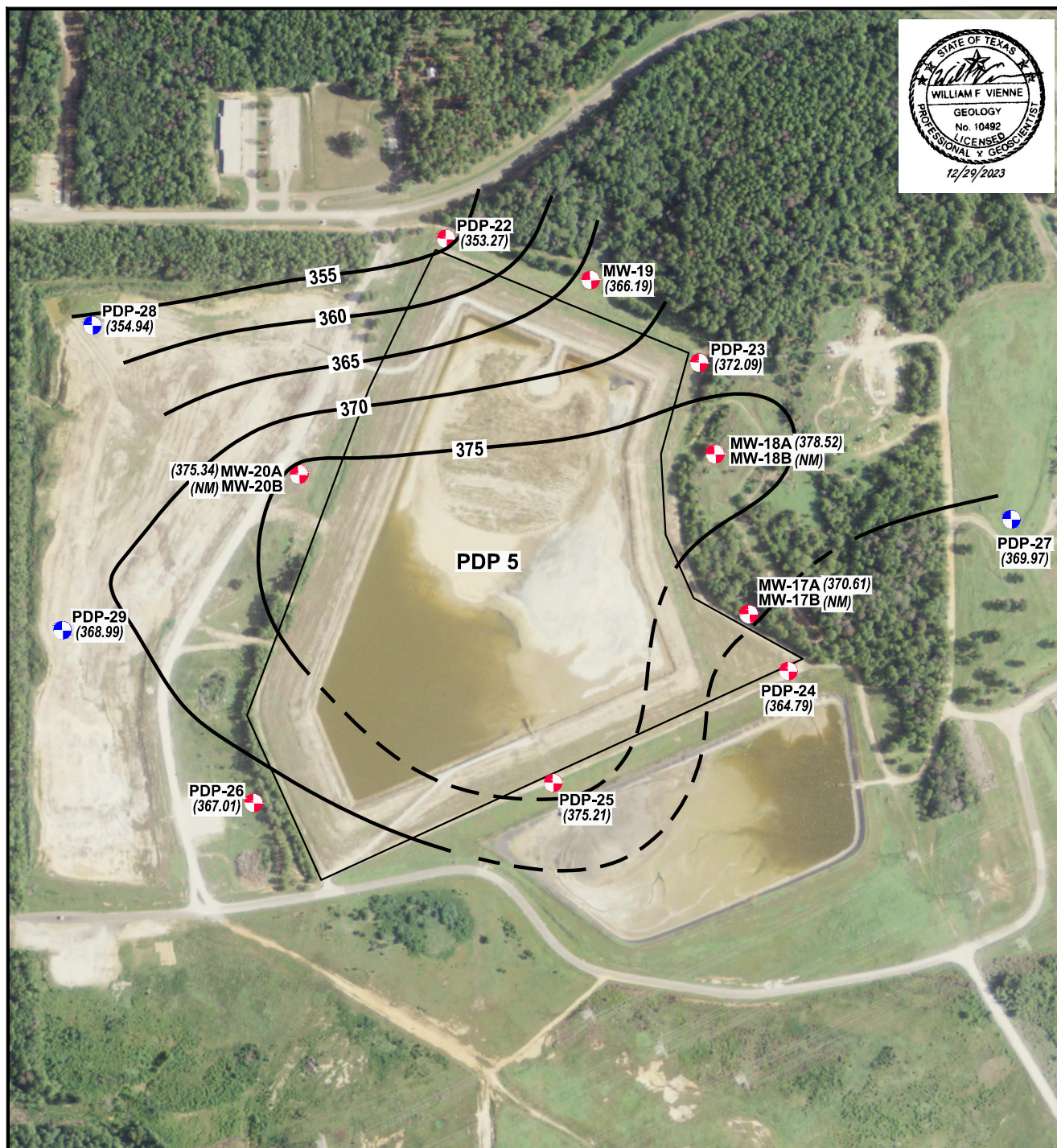
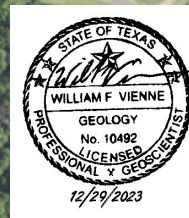
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION

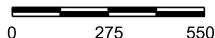
-  CCR Monitoring Well Location
-  Non-CCR Monitoring Well Used to Further Evaluate Groundwater Flow Direction
- (374.34)** Groundwater Potentiometric Surface (ft. MSL)
- 360 —** Groundwater Potentiometric Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet



SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 2

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - DEC. 14, 2015

PROJECT: 5164B

BY: AJD

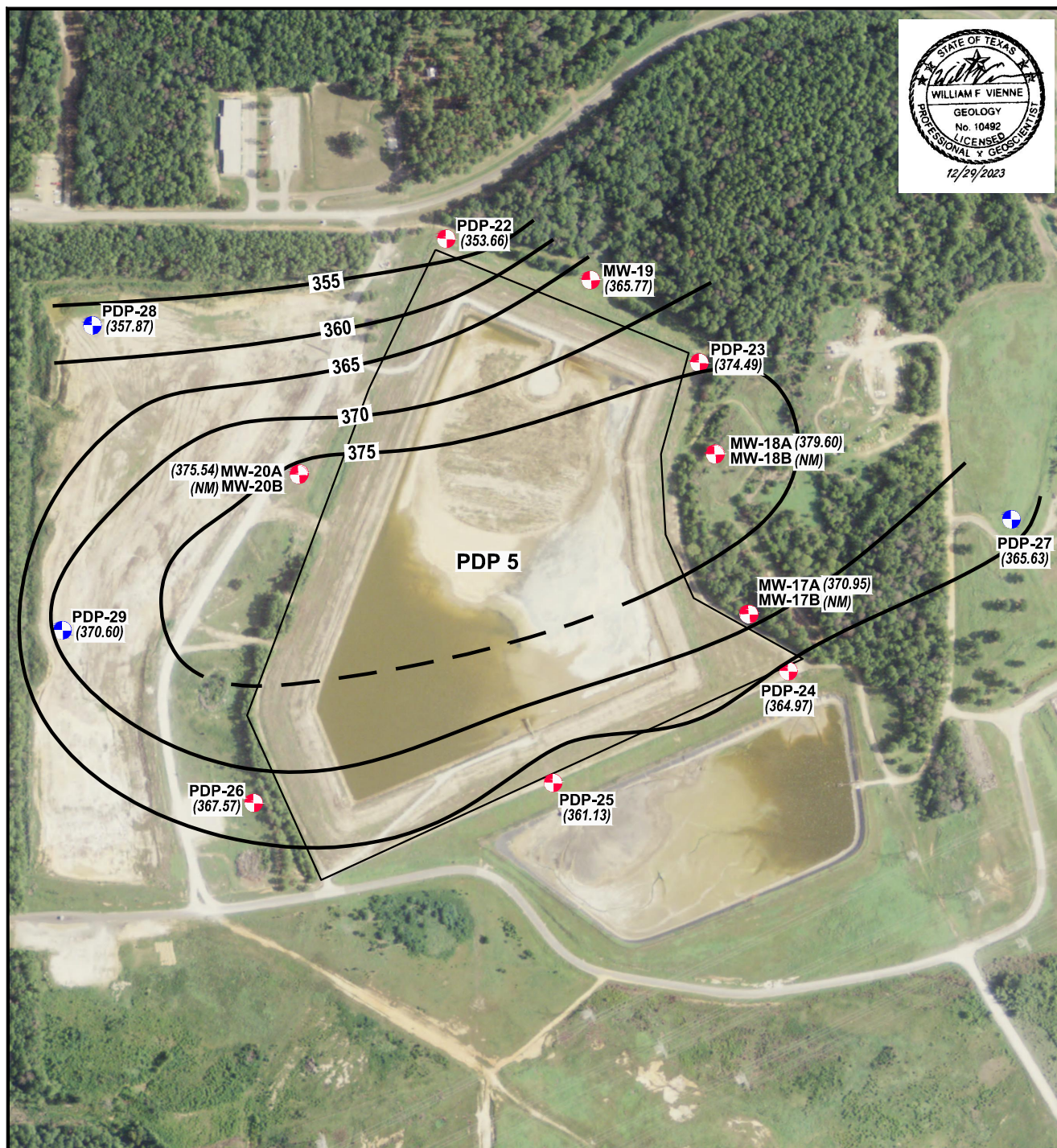
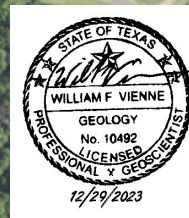
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION



CCR Monitoring Well Location



Non-CCR Monitoring Well  
Used to Further Evaluate  
Groundwater Flow Direction

(374.34) Groundwater Potentiometric  
Surface (ft. MSL)

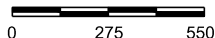
— 360 — Groundwater Potentiometric  
Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet



SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 3

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - FEB. 24, 2016

PROJECT: 5164B

BY: AJD

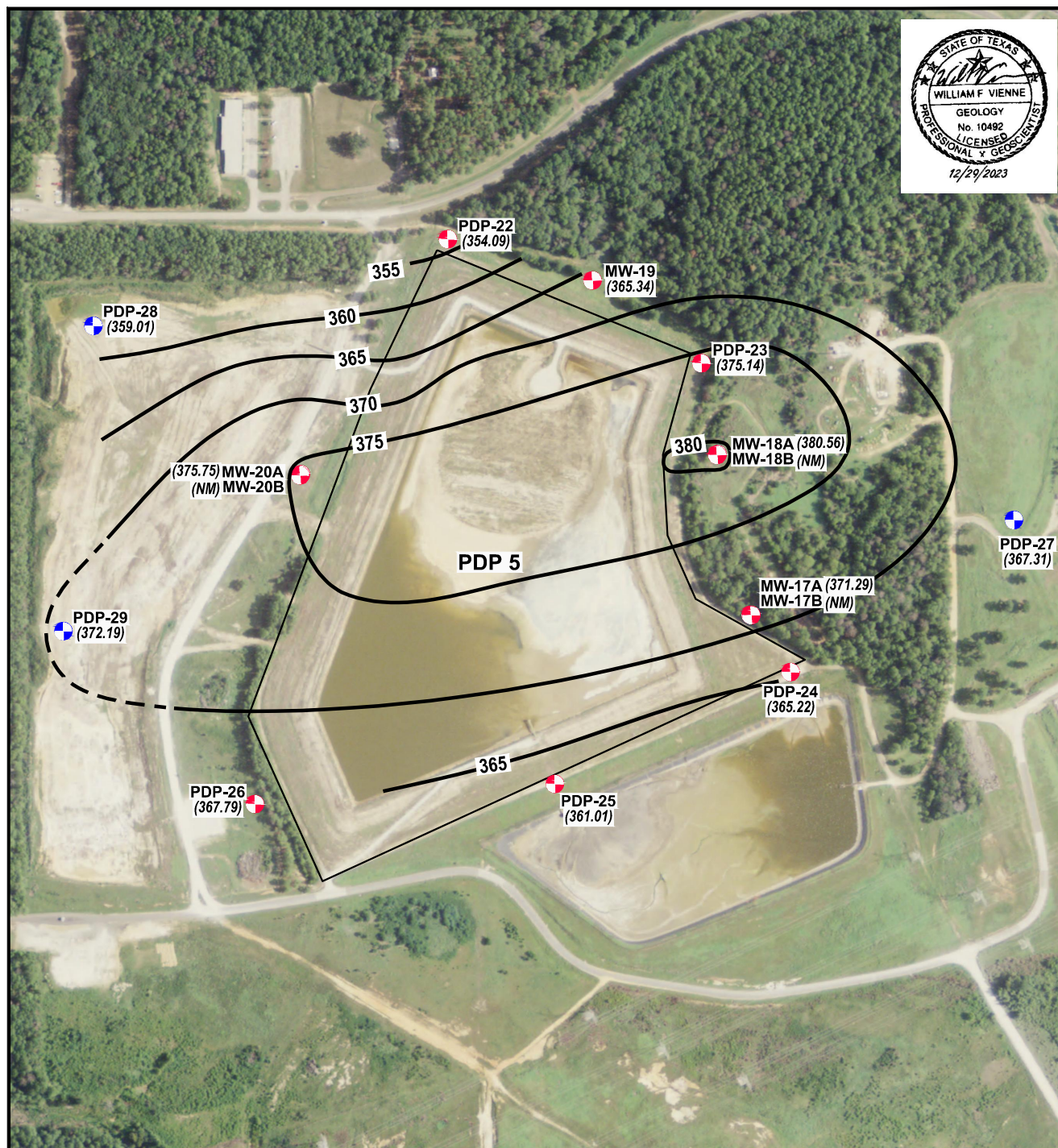
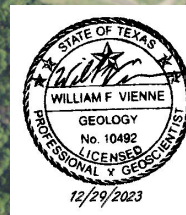
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION



CCR Monitoring Well Location



Non-CCR Monitoring Well  
Used to Further Evaluate  
Groundwater Flow Direction

(374.34) Groundwater Potentiometric  
Surface (ft. MSL)

— 360 — Groundwater Potentiometric  
Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet

0 275 550

SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 4

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - APRIL 5, 2016

PROJECT: 5164B

BY: AJD

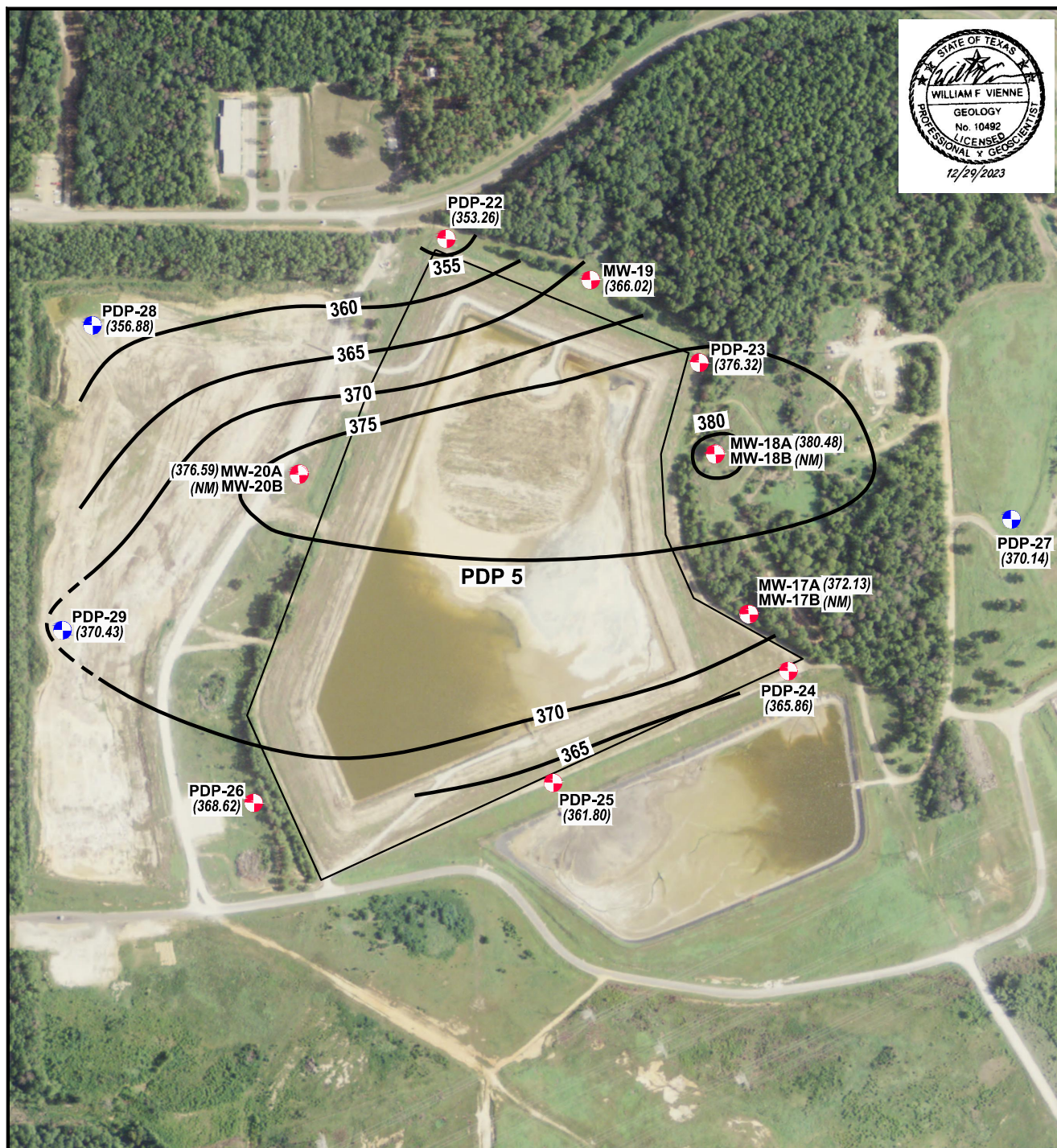
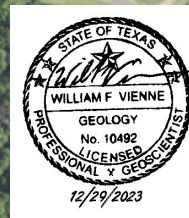
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION

-  CCR Monitoring Well Location
-  Non-CCR Monitoring Well Used to Further Evaluate Groundwater Flow Direction
- (374.34) Groundwater Potentiometric Surface (ft. MSL)
- 360 — Groundwater Potentiometric Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet

0 275 550

SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 5

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - JUNE 6, 2016

PROJECT: 5164B

BY: AJD

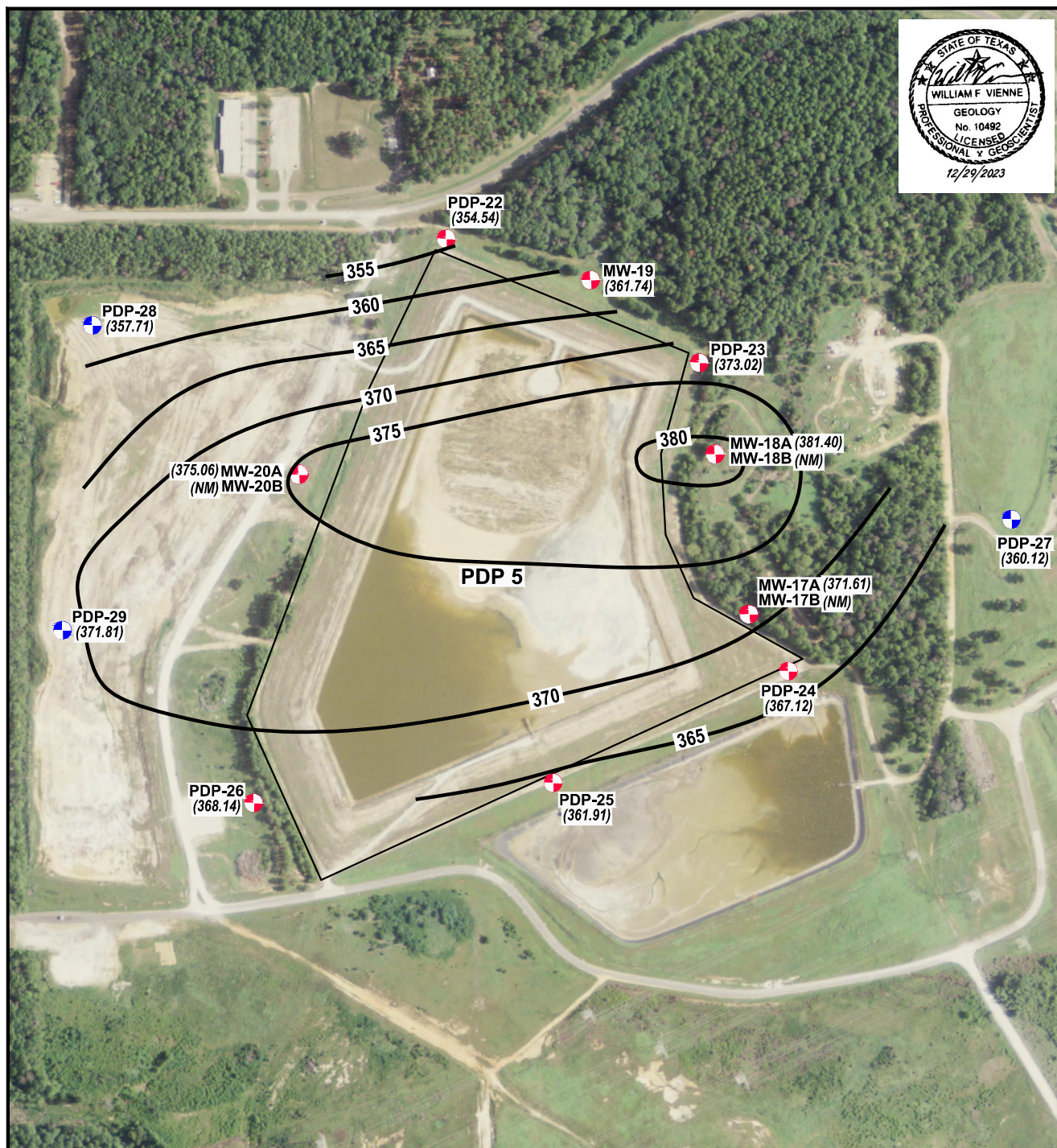
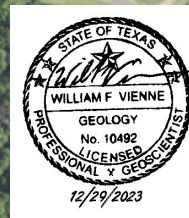
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION

-  CCR Monitoring Well Location
-  Non-CCR Monitoring Well Used to Further Evaluate Groundwater Flow Direction
- (374.34) Groundwater Potentiometric Surface (ft. MSL)
- 360 — Groundwater Potentiometric Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet

0 275 550

SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 6

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - AUGUST 9, 2016

PROJECT: 5164B

BY: AJD

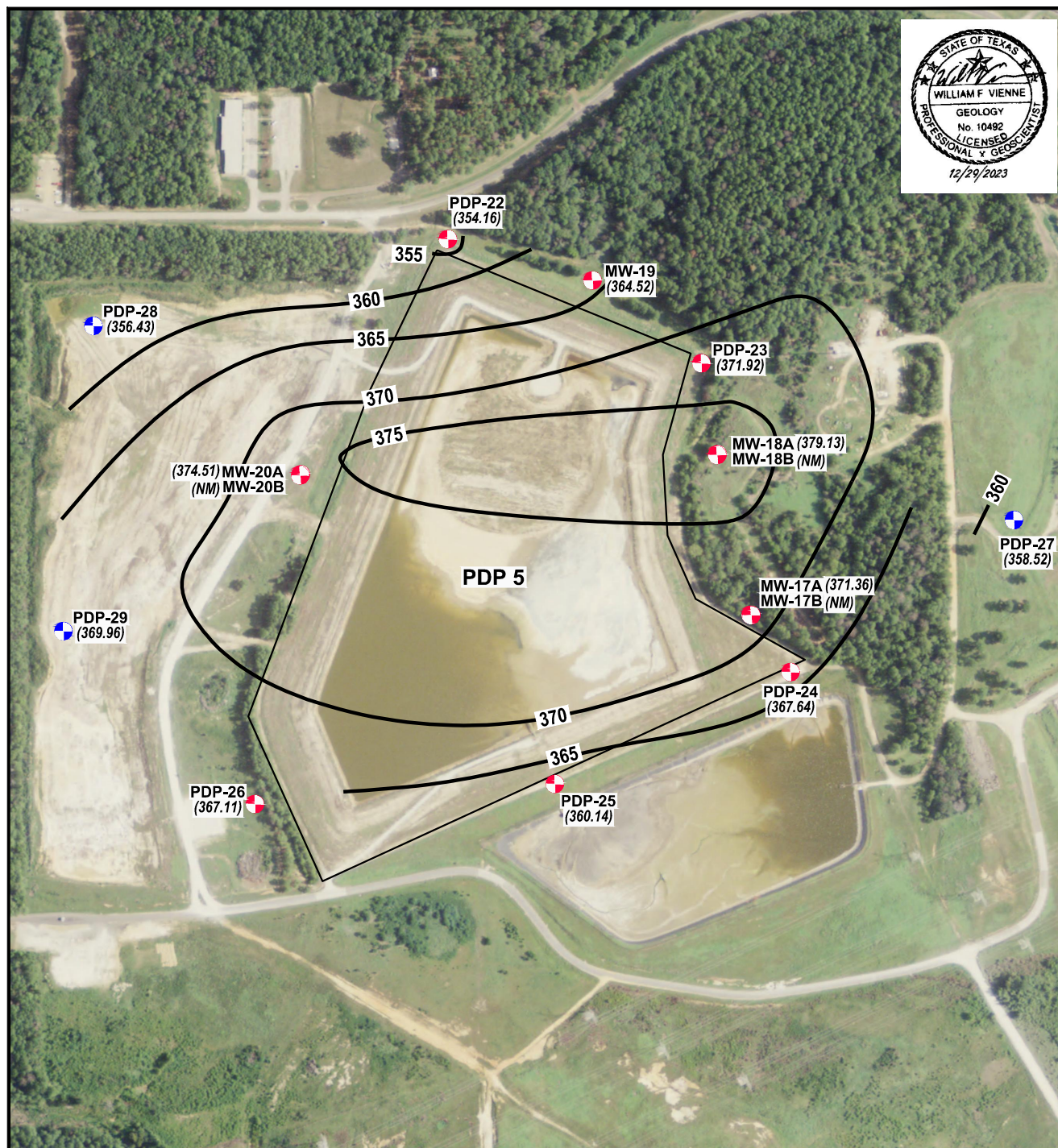
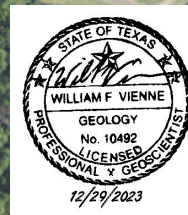
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION



CCR Monitoring Well Location



Non-CCR Monitoring Well  
Used to Further Evaluate  
Groundwater Flow Direction

(374.34) Groundwater Potentiometric  
Surface (ft. MSL)

— 360 — Groundwater Potentiometric  
Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet

0 275 550

SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 7

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - OCTOBER 17, 2016

PROJECT: 5164B

BY: AJD

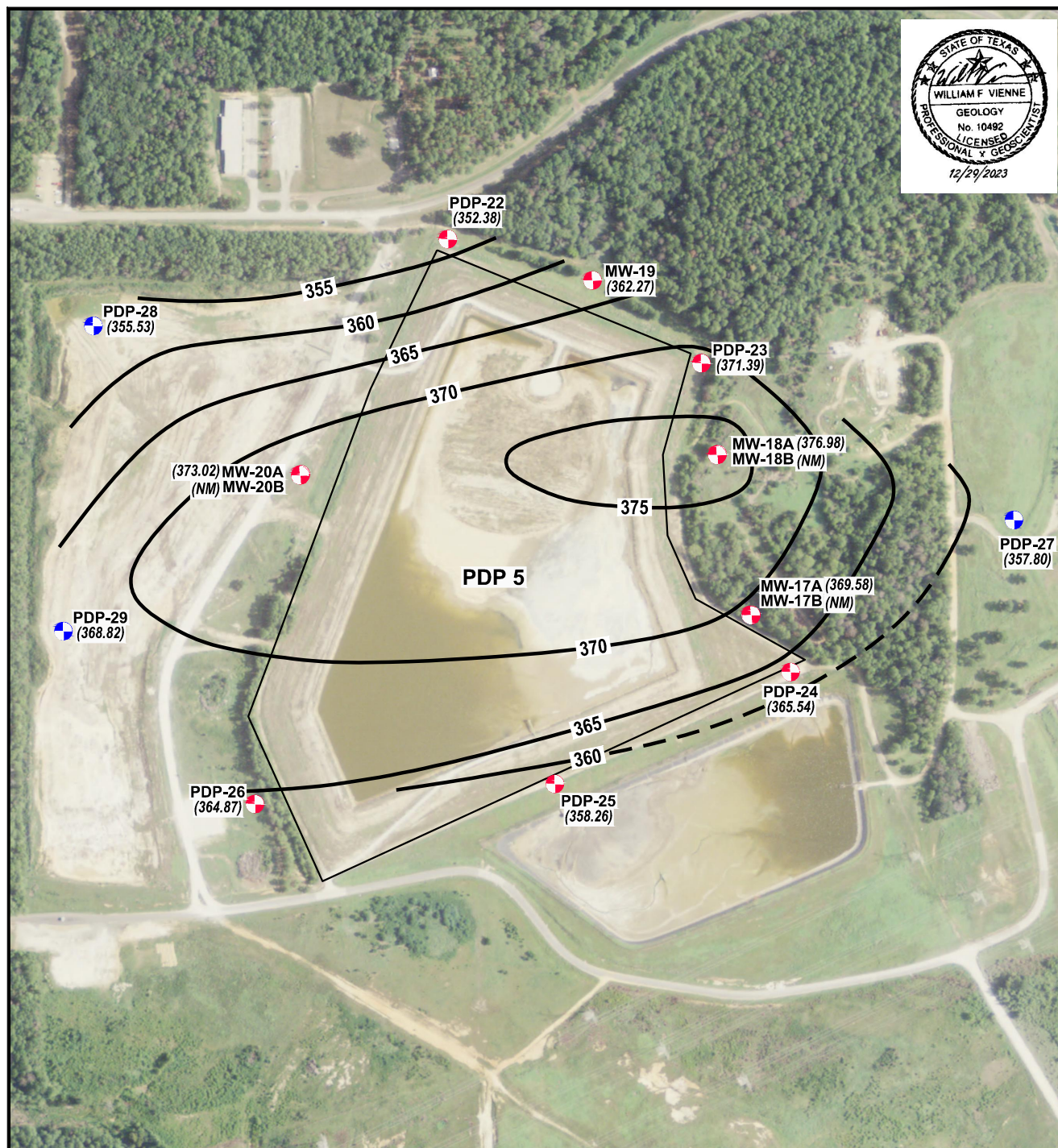
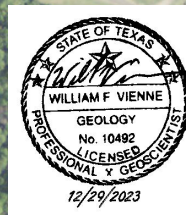
REVISIONS

DATE: SEPT., 2017

CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS





## EXPLANATION

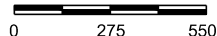
- CCR Monitoring Well Location
- Non-CCR Monitoring Well Used to Further Evaluate Groundwater Flow Direction
- (374.34) Groundwater Potentiometric Surface (ft. MSL)
- 360 — Groundwater Potentiometric Surface Contour (C.I. = 5 ft.)

### Notes:

1. Only Zone A wells were used to construct potentiometric surface contours.



Scale in Feet



SOURCE:  
Imagery from www.tnris.gov, Rusk County, aerial photographs, 2012.

## MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 8

## PDP 5 - GROUNDWATER ZONE A POTENTIOMETRIC SURFACE MAP - DECEMBER 11, 2016

PROJECT: 5164B

BY: AJD

REVISIONS

DATE: SEPT., 2017

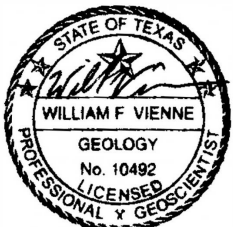
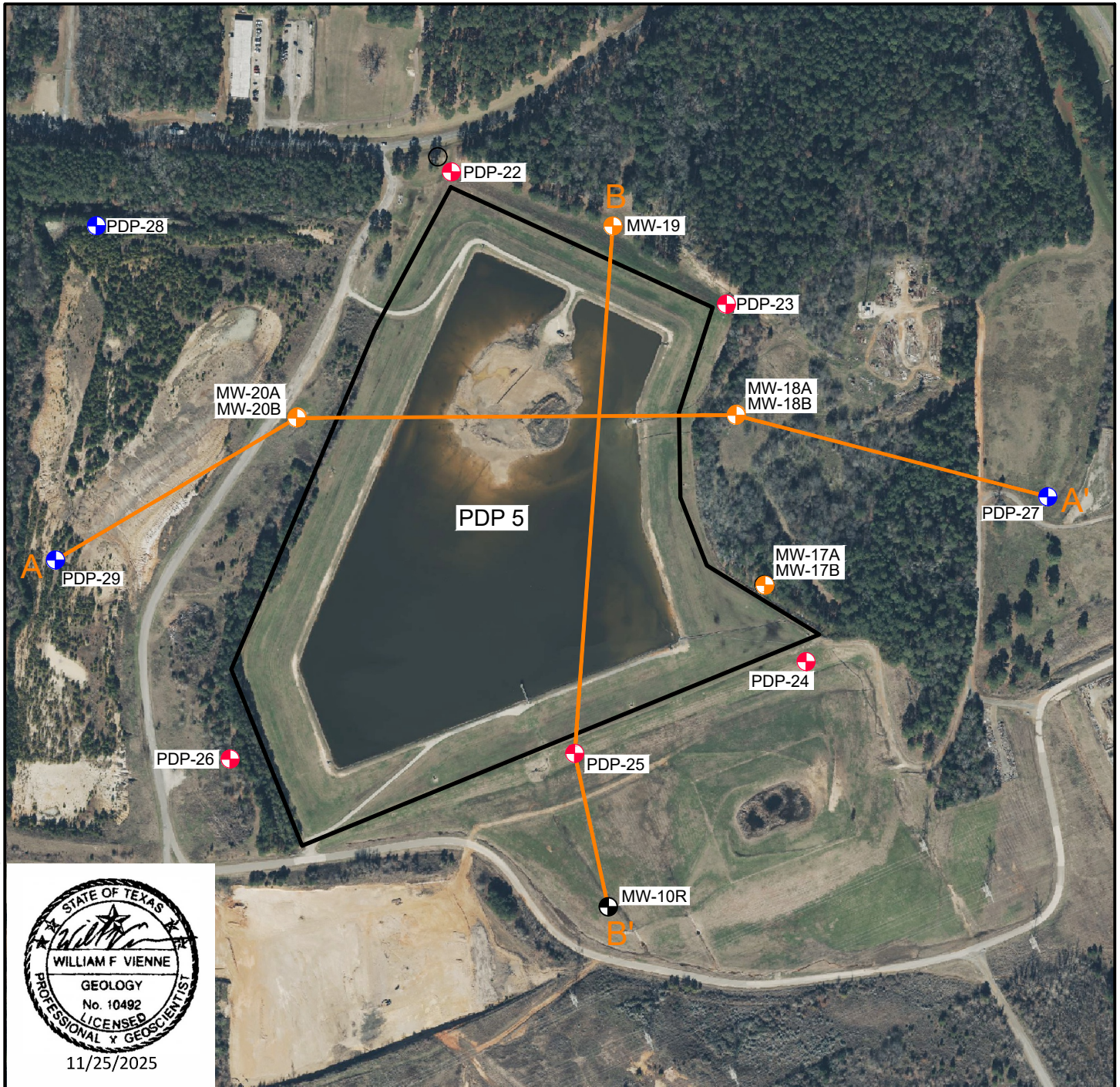
CHECKED: PJB

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**ATTACHMENT 4**

**PDP-5 Cross Sections and Associated Figures**

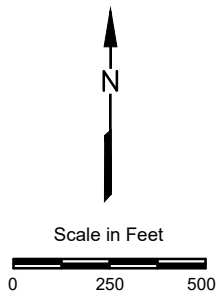




11/25/2025

## EXPLANATION

-  Pre-Existing Well Used as CCR Monitoring
-  Non-CCR Monitoring Well
-  CCR Monitoring Well Location Installed in 2015
-  Non-CCR Monitoring Well Used to Evaluate Groundwater Flow Direction
-  Geologic Cross Section Location Lines



**MARTIN LAKE STEAM ELECTRIC STATION**  
TATUM, TEXAS

## Figure 2 CROSS SECTION LOCATION MAP

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

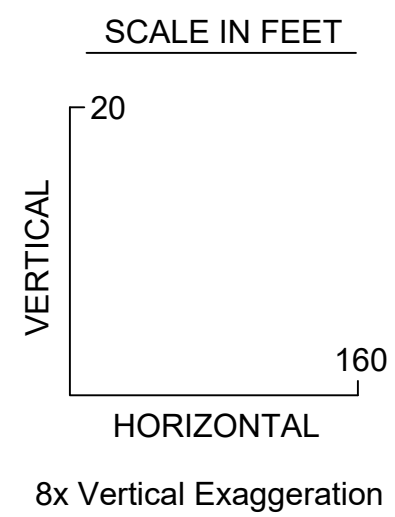
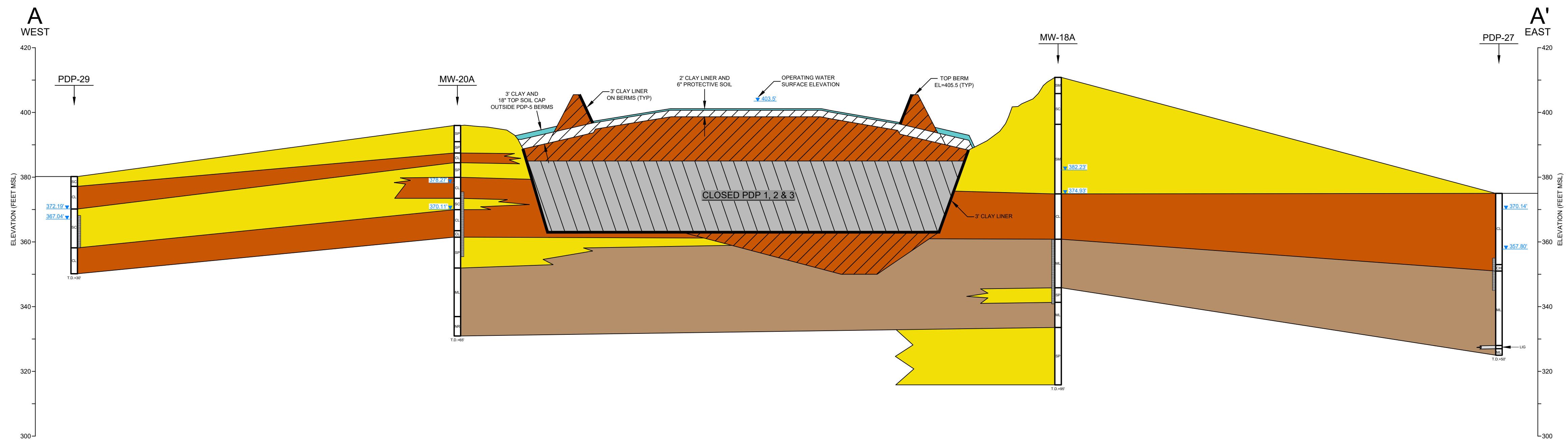
**Bullock, Bennett & Associates, LLC**

Engineering and Geoscience

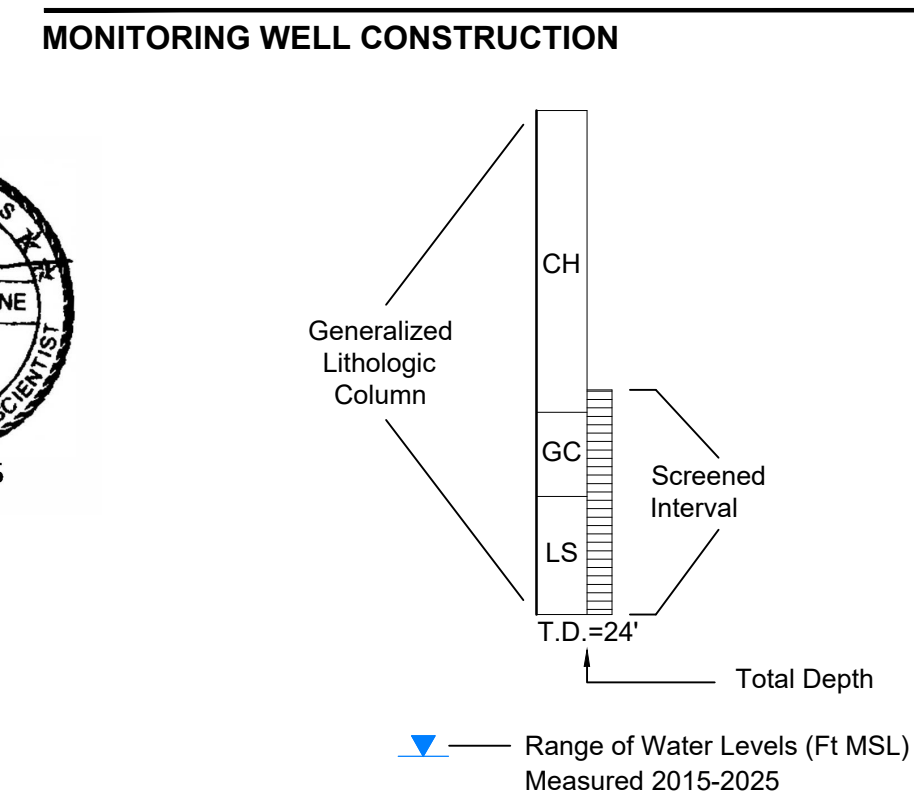
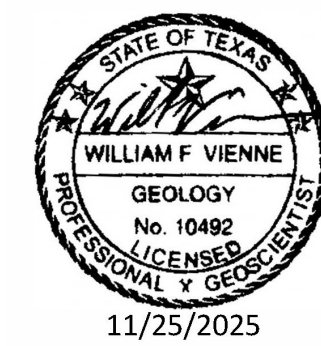
Texas Registrations: Engineering F-8542, Geoscience 50127

Aerial Source:  
2025 Microsoft Corporation; 2025 Maxar; CNES 2025 Distribution Airbus DS;  
2025 TMAP Mobility Earthstar Geographics SIO



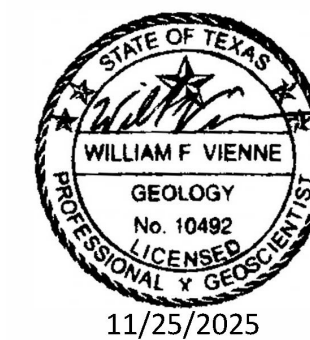
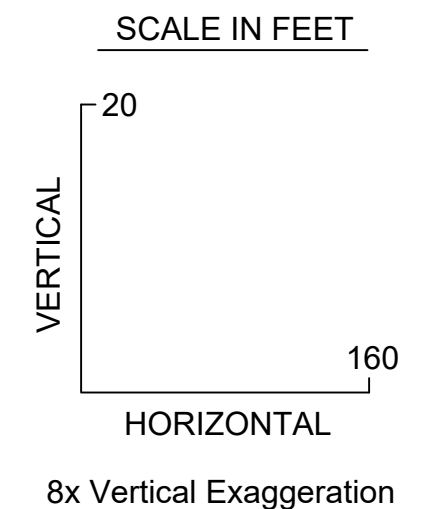
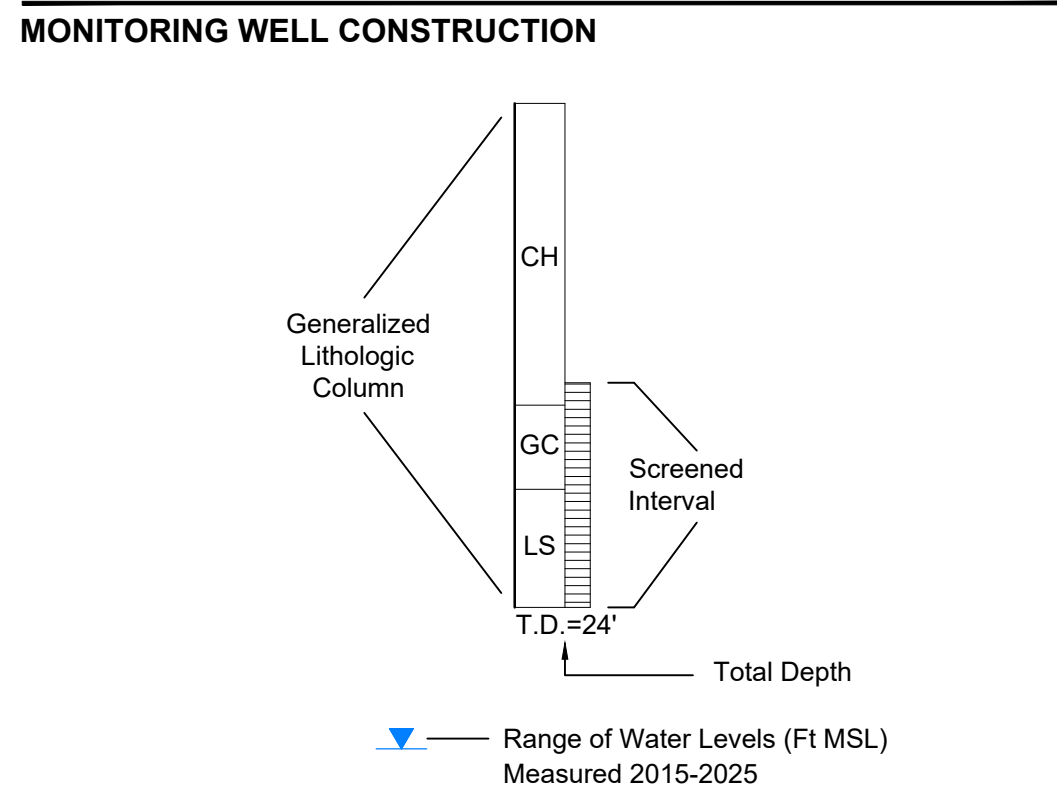
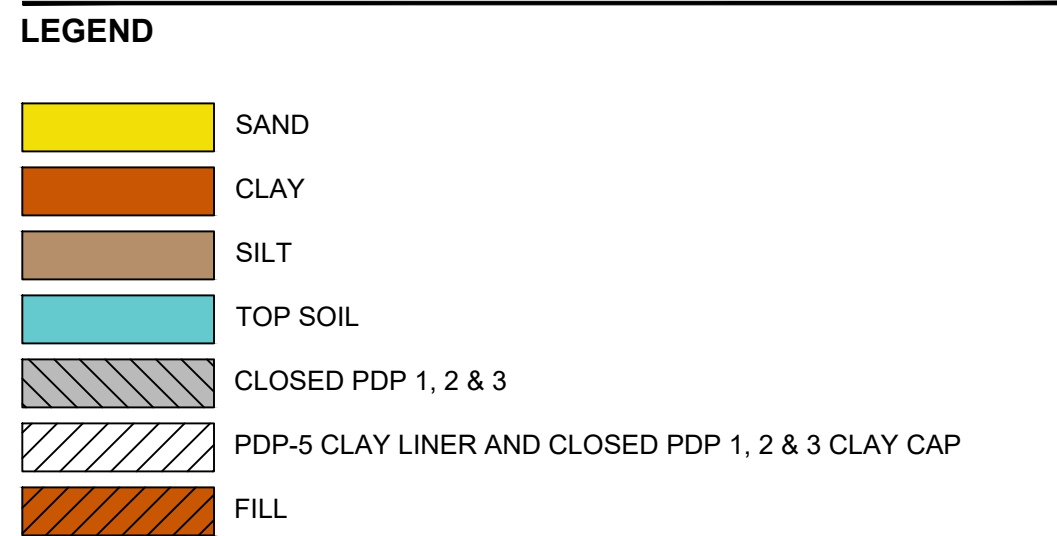
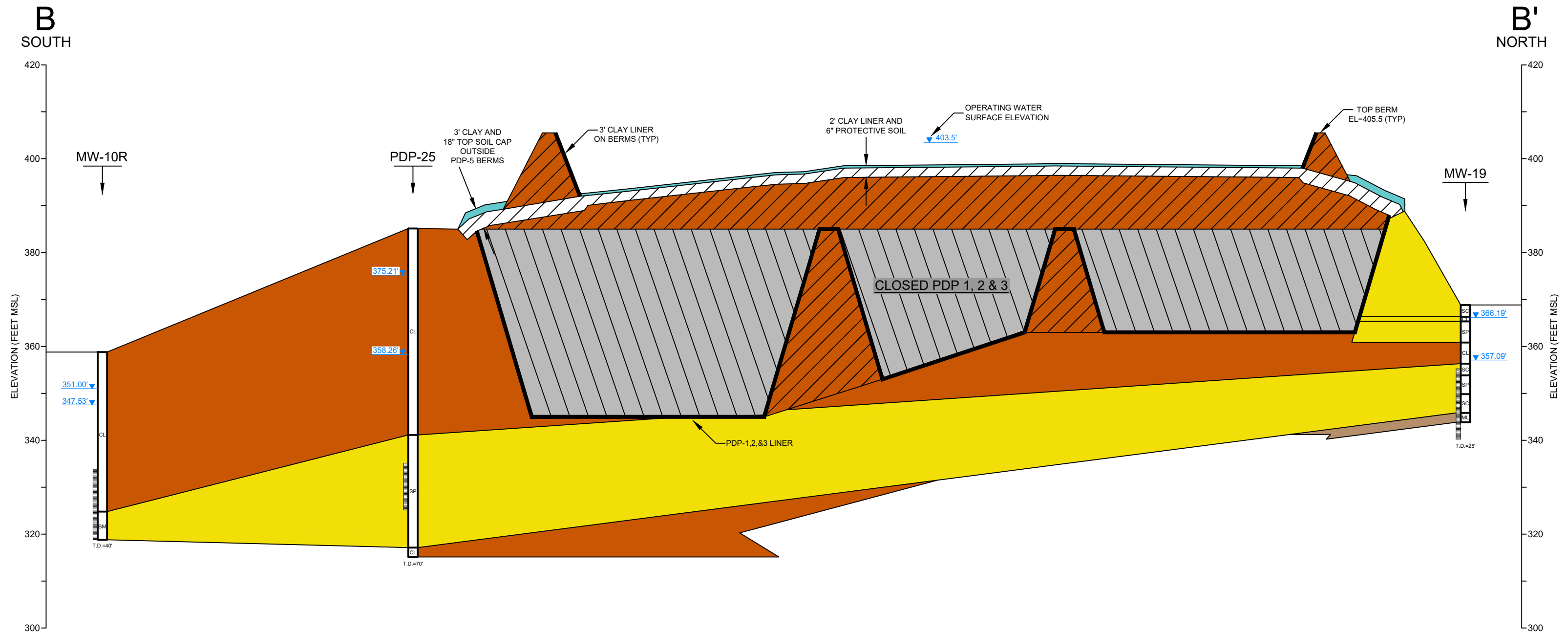


- LEGEND**
- SAND
  - CLAY
  - SILT
  - TOP SOIL
  - CLOSED PDP 1, 2 & 3
  - PDP-5 CLAY LINER AND CLOSED PDP 1, 2 & 3 CLAY CAP
  - FILL



| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| GEOLOGIC CROSS SECTION A-A'                               |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |





|                                                           |         |                 |             |
|-----------------------------------------------------------|---------|-----------------|-------------|
| MARTIN LAKE STEAM ELECTRIC STATION<br>TATUM, TEXAS        |         |                 |             |
| GEOLOGIC CROSS SECTION B-B'                               |         |                 |             |
| PROJECT: 23643V-32                                        | BY: HLS | DATE: NOV. 2025 | CHECKED: WV |
| Bullock, Bennett & Associates, LLC                        |         |                 |             |
| Engineering and Geoscience                                |         |                 |             |
| Texas Registrations: Engineering F-8542, Geoscience 50127 |         |                 |             |

**ATTACHMENT 5**

**TCEQ Closure Approval Letter for PDP-1, PDP-2, and PDP-3**



Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

March 12, 2015

Mr. David P. Duncan  
Director Environmental Generation  
Luminant Power  
1601 Bryan Street (EP-27)  
Dallas, Texas 75201

Re: Approval  
*Closure Report, Waste Management Unit(s) 004,005, 006, dated December 5, 2014*  
Luminant Power, Martin Lake Steam Electric Station, 8850 FM 2658 North,  
TCEQ SWR No. 31277, CN603256413, RN102583093  
EPA ID No. TXD000821306

Dear Mr. Duncan:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above referenced submittal, dated December 5, 2014. Non-hazardous Waste Management Units (WMUs) 004, 005, and 006 are closed landfills containing residual combustion by-products that border each other at the subject facility. An Affected Property Assessment Report (APAR) dated May 13, 2014 subsequently approved by the TCEQ on August 29, 2014 indicated that all potential site chemical of concern (COCs) in soils and groundwater were reported below their respective Tier 1 Residential Protective Concentration Levels (PCLs). No groundwater wells are located within 0.5 miles of the site. Therefore, Luminant Power has pursued closure of the above referenced WMUs in accordance with TCEQ Guidance Document RG-366/TRRP-2A. In accordance with this guidance document, for WMUs where evidence of a release to the environment has not occurred, the subject WMUs were closed in accordance with 30 Texas Administrative Code Chapter 350.2(h).

These units were closed in-place with a two-foot thick compacted clay cap. The construction documentation and other historical records indicate that the non-hazardous wastes present in the closed units have been capped with two feet of compacted clay and three feet of fill soil. Irrespective of the findings of the APAR referenced above, Luminant will voluntarily continue semi-annual monitoring of the existing groundwater monitoring well network in conjunction with monitoring the active impoundment, PDP5 (WMU 024). The closed subject WMUs will be deeded recorded to prevent future use of groundwater in the footprint of the WMUs. Please submit your proof of filing your institutional controls in accordance with 30 TAC Chapter 350.111 within 90 days from the date of this letter.

Ms. David Duncan  
Page 2  
March 12, 2015  
SWR No. 31277

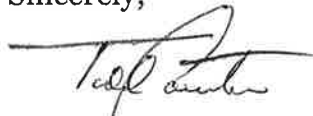
Based on the information contained in the subject report and other information available to staff, the TCEQ accepts the closure of the above referenced waste management unit. With the exception being the deed notice information requested above, no further action is required under 30 Texas Administrative Code (TAC) §335.8.

A copy of this letter has been forwarded to the TCEQ Registration and Reporting Section to update your Notice of Registration (NOR). For questions regarding the NOR, please contact the Registration and Reporting Section at (512) 239-6413

Please be aware that it is the continuing obligation of persons associated with a site to ensure that municipal hazardous waste and industrial solid waste are managed in a manner which does not cause the discharge or imminent threat of discharge of waste into or adjacent to waters in the state, a nuisance, or the endangerment of the public health and welfare as required by 30 TAC §335.4. If the actual response action fails to comply with these requirements, please take any necessary and authorized action to correct such conditions. A TCEQ field inspector may conduct an inspection of your site to determine compliance with the subject closure report.

Questions concerning this letter should be directed to me at (512) 239-2591. When responding by mail, please submit an original and one copy of all correspondence and reports to the TCEQ Remediation Division at Mail Code MC-127. An additional copy should be submitted to the local TCEQ Region Office. Please note that the Remediation Division has instituted a policy of sending letters via Portable Document Format (PDF) and email when appropriate. Therefore, current email addresses and the site identification information in the reference block should be included in all future submittals.

Sincerely,



C. Todd Counter, Project Manager  
Team 1, VCP-CA Section  
Remediation Division  
Texas Commission on Environmental Quality

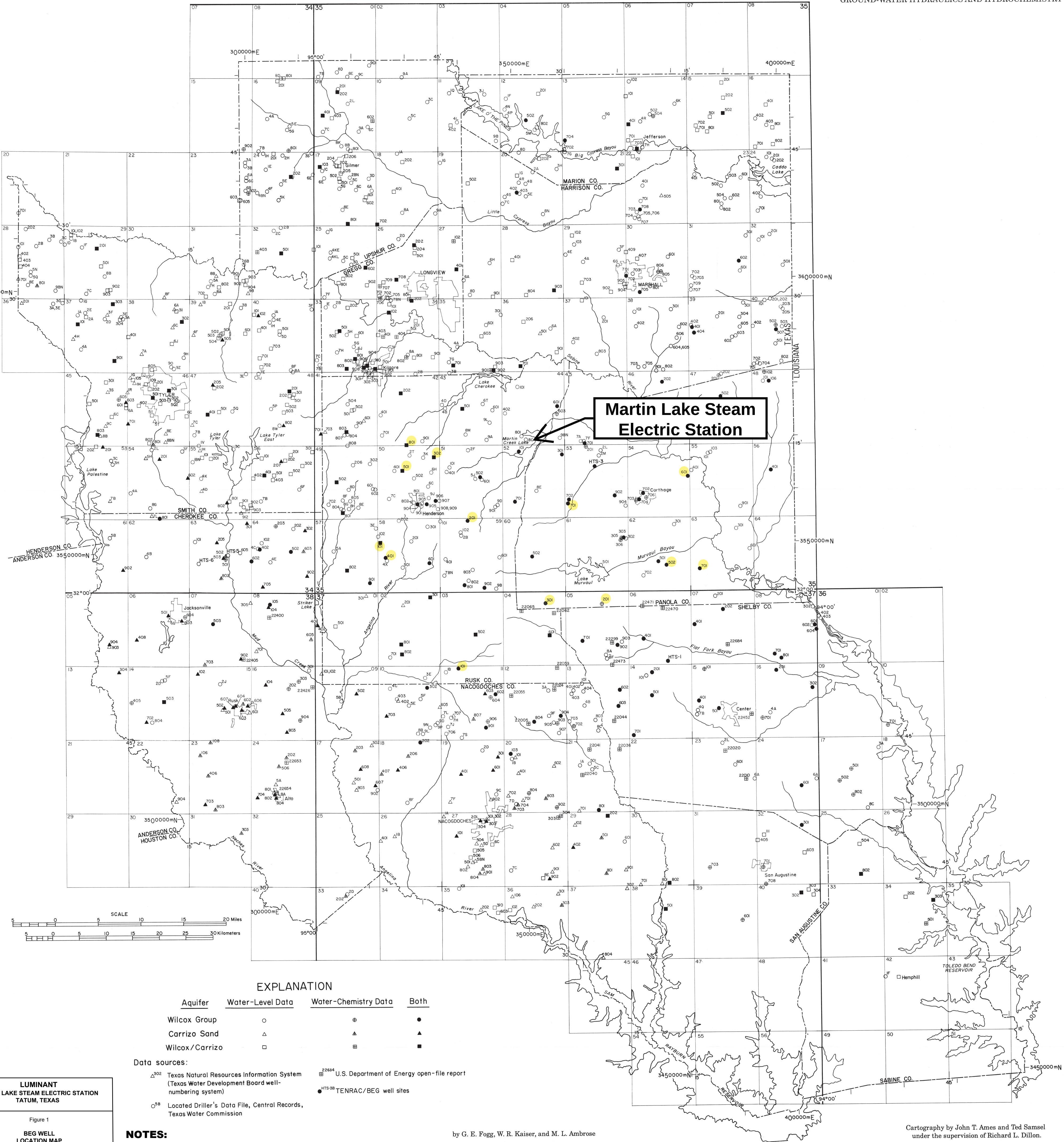
CTC/mdh

cc: Mr. Brian Thomas, Pastor, Behling & Wheeler, LLC, 5416 Plaza Drive, Texarkana, ✓  
Texas 75503-1607  
Mr. Michael Brashear, Waste Section Manager, TCEQ Region 5 Office, Tyler

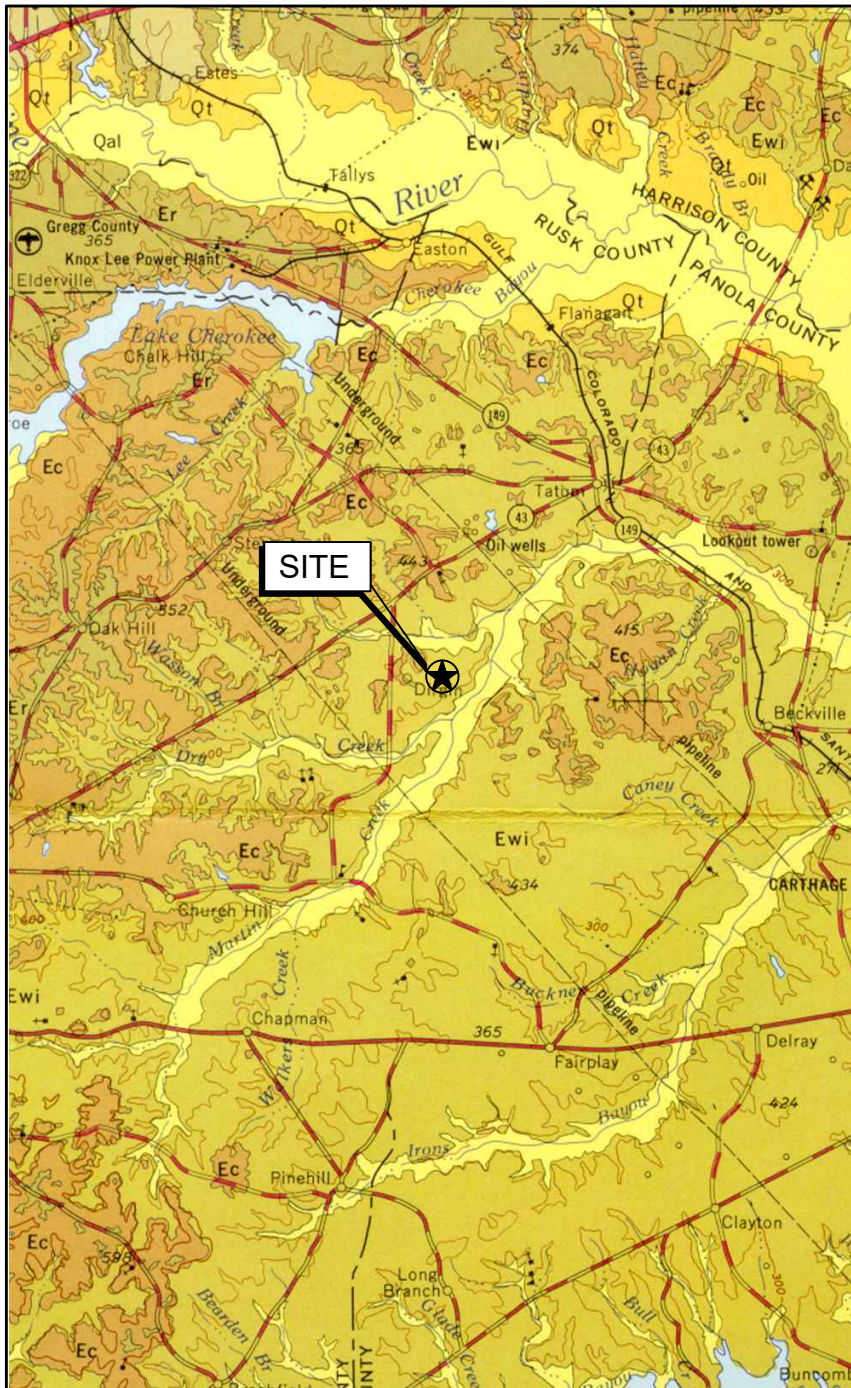
**ATTACHMENT 6**

**BEG Study Data Summary**

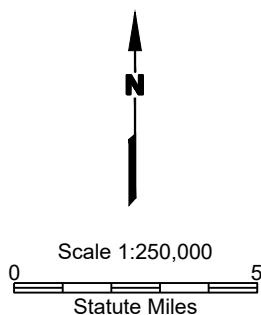








— Approximate Property Boundary

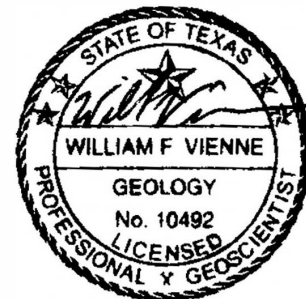


Source: Geologic Atlas of Texas, Tyler Sheet, 1:75.

#### EXPLANATION

(Formations Described in Separate Table)

|             |     |                                       |            |
|-------------|-----|---------------------------------------|------------|
| Recent      | Qal | Alluvium                              | QUATERNARY |
|             |     |                                       |            |
| Pleistocene | Qt  | Fluviatile terrace deposits undivided |            |
|             |     |                                       |            |
| Eocene      | Er  | Reklaw Formation                      | TERTIARY   |
|             | Ec  | Carriño Sand                          |            |
|             | Ewi | Wilco Group undivided                 |            |



11/25/2025

**LUMINANT**  
MARTIN LAKE STEAM ELECTRIC STATION  
TATUM, TEXAS

Figure 2

### REGIONAL GEOLOGIC MAP

PROJECT: 23643

BY: SLB

REVISIONS

DATE: Nov. 2025

CHECKED: WV

**Bullock, Bennett & Associates, LLC**  
Engineering and Geoscience

**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| County   | Well No. | Data Source | Unit  | Interval | Date Collected | Depth (ft) | pH (s.u.) | Ca (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) |
|----------|----------|-------------|-------|----------|----------------|------------|-----------|-----------|-----------|------------|------------|
| Cherokee | 22400    | DOE         | WX/CZ | A        | 11/8/1978      | 610        | 6.3       | 12.9      | 25.0      | 121        | 463.31     |
| Cherokee | 22405    | DOE         | WX/CZ | A        | 11/8/1978      | 400        | 6.1       | 11.8      | 14.0      | 43.0       | 191.52     |
| Cherokee | 22426    | DOE         | WX/CZ | A        | 11/11/1978     | 151        | 5.6       | 7.7       | 14.6      | 15.6       | 161.29     |
| Cherokee | 22653    | DOE         | WX/CZ | A        | 11/14/1978     | 650        | 8.9       | 0.1       | 19.0      | 13.0       | 444.78     |
| Cherokee | 22654    | DOE         | WX/CZ | A        | 11/14/1978     | 499        | 8.8       | 0.4       | 71.0      | 5.0        | 853.97     |
| Cherokee | 3454801  | TNRIS       | WX    | A        | 3/9/1971       | 1097       | 8.3       | 2.0       | 9.0       | 4.0        | 633.00     |
| Cherokee | 3461902  | TNRIS       | CZ    | A        | 3/9/1971       | 668        | 7.5       | 4.0       | 12.0      | 14.0       | 196.00     |
| Cherokee | 3463205  | TNRIS       | CZ    | A        | 3/8/1971       | 300        | 7.7       | 5.0       | 12.0      | 36.0       | 383.00     |
| Cherokee | 3463301  | TNRIS       | CZ    | A        | 9/22/1976      | 283        | 8.3       | 41.0      | 24.0      | 216.0      | 495.34     |
| Cherokee | 3463501  | TNRIS       | WX    | A        | 3/4/1971       | 300        | 8.3       | 3.0       | 20.0      | 4.0        | 782.00     |
| Cherokee | 3463502  | TNRIS       | CZ    | A        | 3/4/1971       | 200        | 7.3       | 5.0       | 13.0      | 117.0      | 352.00     |
| Cherokee | 3453503  | TNRIS       | CZ    | A        | 9/22/1976      | 300        | 7.6       | 3.0       | 11.0      | 96.0       | 338.09     |
| Cherokee | 3453602  | TNRIS       | WX    | A        | 3/1/1971       | 540        | 8.5       | 2.0       | 16.0      | 4.0        | 757.00     |
| Cherokee | 3463802  | TNRIS       | CZ    | A        | 3/5/1971       | 210        | 7.9       | 6.0       | 16.0      | 80.0       | 351.00     |
| Cherokee | 3463802  | TNRIS       | WX    | A        | 3/3/1971       | 250        | 7.2       | 2.0       | 26.0      | 185.0      | 472.00     |
| Cherokee | 3464203  | TNRIS       | CZ    | A        | 3/4/1971       | 97         | 5.7       | 2.0       | 4.0       | 4.0        | 39.00      |
| Cherokee | 3464402  | TNRIS       | WX    | A        | 3/8/1971       | 425        | 8.5       | 3.0       | 13.0      | 7.0        | 577.00     |
| Cherokee | 3464502  | TNRIS       | WX    | A        | 3/3/1971       | 419        | 8.7       | 3.0       | 11.0      | 37.0       | 688.00     |
| Cherokee | 3464603  | TNRIS       | CZ    | A        | 3/3/1971       | 118        | 6.4       | 2.0       | 2.0       | 5.0        | 44.00      |
| Cherokee | 3464705  | TNRIS       | CZ    | A        | 9/22/1976      | 205        | 7.9       | 32.0      | 23.0      | 177.0      | 482.91     |
| Cherokee | 3464902  | TNRIS       | CZ    | A        | 3/4/1971       | 78         | 7         | 53.0      | 6.0       | 24.0       | 220.00     |
| Cherokee | 3761402  | TNRIS       | CZ    | A        | 9/23/1976      | 460        | 7.5       | 15.0      | 28.0      | 203.0      | 474.88     |
| Cherokee | 3733202  | TNRIS       | CZ    | A        | 10/6/1970      | 960        | 8.5       | 1.0       | 21.0      | 55.0       | 393.00     |
| Cherokee | 3805904  | TNRIS       | CZ    | A        | 2/25/1971      | 340        | 7.4       | 1.0       | 8.0       | 10.0       | 193.00     |
| Cherokee | 3886408  | TNRIS       | CZ    | A        | 6/29/1977      | 707        | 8.3       | 4.0       | 36.0      | 53.0       | 308.96     |
| Cherokee | 3806501  | TNRIS       | CZ    | A        | 1/13/1955      | 752        | 8.3       | 2.0       | 18.0      | 41.0       | 470.00     |
| Cherokee | 38906603 | TNRIS       | CZ    | A        | 6/29/1977      | 685        | 8.6       | 1.0       | 13.0      | 5.0        | 414.71     |
| Cherokee | 3806604  | TNRIS       | WX    | A        | 4/5/1952       | 720        | 8.2       | 6.0       | 25.0      | 15.0       | 460.40     |
| Cherokee | 3807503  | TNRIS       | WX    | B        | 2/18/1971      | 1215       | 8.6       | 2.0       | 40.0      | 4.0        | 896.00     |
| Cherokee | 3807703  | TNRIS       | CZ    | A        | 3/11/1971      | 400        | 8.4       | 3.0       | 13.0      | 4.0        | 341.00     |
| Cherokee | 3807902  | TNRIS       | CZ    | A        | 2/16/1971      | 370        | 5.5       | 12.0      | 14.0      | 79.0       | 162.05     |
| Cherokee | 3808104  | TNRIS       | CZ    | A        | 12/1/1962      | 555        | 6.1       | 19.0      | 14.0      | 208.0      | 511.11     |
| Cherokee | 3808105  | TNRIS       | WX    | A        | 9/23/1976      | 993        | 8.6       | 1.0       | 60.0      | 4.0        | 921.24     |
| Cherokee | 3808005  | TNRIS       | CZ    | A        | 2/17/1971      | 150        | 5.6       | 1.0       | 4.0       | 4.0        | 52.00      |
| Cherokee | 3613304  | TNRIS       | CZ    | A        | 1/13/1971      | 648        | 7.8       | 2.0       | 11.0      | 9.0        | 205.00     |
| Cherokee | 3814405  | TNRIS       | WX    | A        | 1/13/1971      | 500        | 8.2       | 2.0       | 17.0      | 4.0        | 670.00     |
| Cherokee | 3814503  | TNRIS       | WC/CZ | A        | 1/6/1971       | 448        | 8.2       | 1.0       | 30.0      | 36.0       | 311.00     |
| Cherokee | 3814702  | TNRIS       | CZ    | A        | 1/8/1971       | 180        | 8.4       | 10.0      | 24.0      | 94.0       | 475.00     |
| Cherokee | 3815102  | TNRIS       | CZ    | A        | 1/6/1971       | 670        | 8.4       | 1.0       | 13.0      | 17.0       | 297.00     |
| Cherokee | 3815502  | TNRIS       | CZ    | A        | 1/13/1971      | 429        | 7.8       | 1.0       | 18.0      | 56.0       | 4464.00    |
| Cherokee | 3815602  | TNRIS       | CZ    | A        | 10/27/1970     | 718        | 7.7       | 2.0       | 19.0      | 48.0       | 469.00     |
| Cherokee | 3815603  | TNRIS       | CZ    | A        | 10/27/1970     | 450        | 8.0       | 2.0       | 21.0      | 42.0       | 477.00     |
| Cherokee | 3815604  | TNRIS       | CZ    | A        | 1/15/1971      | 550        | 8.5       | 1.0       | 18.0      | 48.0       | 453.00     |
| Cherokee | 3715606  | TNRIS       | CZ    | A        | 1/6/1971       | 520        | 8.6       | 1.0       | 16.0      | 50.0       | 454.00     |
| Cherokee | 3815607  | TNRIS       | CZ    | A        | 1/15/1971      | 675        | 8.6       | 1.0       | 18.0      | 50.0       | 459.00     |
| Cherokee | 3816104  | TNRIS       | CZ    | A        | 1/11/1971      | 295        | 7.8       | 2.0       | 21.0      | 6.0        | 511.00     |
| Cherokee | 3816202  | TNRIS       | WX    | A        | 1/11/1971      | 501        | 8.5       | 3.0       | 218.0     | 4.0        | 1238.00    |
| Cherokee | 3816303  | TNRIS       | WX    | A        | 1/6/1971       | 211        | 6.8       | 56.0      | 14.0      | 53.0       | 243.00     |
| Cherokee | 3816505  | TNRIS       | CZ    | A        | 1/12/1971      | 250        | 8.3       | 2.0       | 40.0      | 9.0        | 570.00     |
| Cherokee | 3816803  | TNRIS       | CZ    | A        | 6/28/1977      | 333        | 8.3       | 1.0       | 23.0      | 26.0       | 459.67     |
| Cherokee | 3816904  | TNRIS       | WX    | A        | 12/16/1970     | 135        | 6.4       | 23.0      | 33.0      | 109.0      | 309.00     |
| Cherokee | 3823106  | TNRIS       | CZ    | A        | 10/28/1970     | 294        | 7.9       | 4.0       | 23.0      | 70.0       | 481.00     |
| Cherokee | 3823108  | TNRIS       | CZ    | A        | 1/14/1971      | 390        | 8.0       | 2.0       | 19.0      | 53.0       | 476.00     |
| Cherokee | 3823406  | TNRIS       | CZ    | A        | 12/8/1977      | 254        | 8.2       | 1.0       | 24.0      | 5.0        | 509.33     |
| Cherokee | 3823703  | TNRIS       | CZ    | A        | 10/28/1970     | 303        | 7.8       | 2.0       | 24.0      | 58.0       | 503.00     |
| Cherokee | 2823803  | TNRIS       | CZ    | A        | 10/26/1970     | 340        | 7.8       | 2.0       | 21.0      | 31.0       | 490.00     |
| Cherokee | 3824202  | TNRIS       | CZ    | A        | 10/21/1970     | 500        | 8.3       | 1.0       | 12.0      | 22.0       | 282.00     |

**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| <b>County</b> | <b>Well No.</b> | <b>Data Source</b> | <b>Unit</b> | <b>Interval</b> | <b>Date Collected</b> | <b>Depth (ft)</b> | <b>pH (s.u.)</b> | <b>Ca (mg/L)</b> | <b>Cl (mg/L)</b> | <b>SO4 (mg/L)</b> | <b>TDS (mg/L)</b> |
|---------------|-----------------|--------------------|-------------|-----------------|-----------------------|-------------------|------------------|------------------|------------------|-------------------|-------------------|
| Cherokee      | 3824566         | TNRIS              | CZ          | A               | 10/21/1970            | 510               | 8.3              | 2.0              | 65.0             | 4.0               | 651.00            |
| Cherokee      | 3824704         | TNRIS              | CZ          | A               | 10/21/1970            | 420               | 7.9              | 3.0              | 13.0             | 5.0               | 723.00            |
| Cherokee      | 3824802         | TNRIS              | CZ          | A               | 10/20/1970            | 545               | 8.1              | 2.0              | 62.0             | 5.0               | 533.00            |
| Cherokee      | 3824804         | TNRIS              | CZ          | A               | 10/20/1970            | 614               | 8.0              | 2.0              | 65.0             | 5.0               | 639.00            |
| Cherokee      | 3931303         | TNRIS              | CZ          | A               | 10/30/1970            | 425               | 7.8              | 1.0              | 46.0             | 30.0              | 604.00            |
|               |                 |                    |             |                 |                       |                   |                  |                  |                  |                   |                   |
| Gregg         | 3525602         | TNRIS              | WX/CZ       | B               | 12/9/1966             | 536               | 6.9              | 18.0             | 19.0             | 27.0              | 187.00            |
| Gregg         | 3526202         | TNRIS              | WX/CZ       | A               | 5/30/1961             | 398               | 7.4              | 9.0              | 382.0            | 23.0              | 886.00            |
| Gregg         | 3526702         | TNRIS              | WX/CZ       | B               | 12/9/1966             | 533               | 7.9              | 2.0              | 73.0             | 16.0              | 529.00            |
| Gregg         | 3526707         | TNRIS              | WX/CZ       | A               | 12/9/1966             | 404               | 8.3              | 4.0              | 121.0            | 19.0              | 684.00            |
| Gregg         | 3526708         | TNRIS              | WX/CZ       | B               | 5/28/1975             | 540               | 7.7              | 7.0              | 480.0            | 3.0               | 1260.78           |
| Gregg         | 3526801         | TNRIS              | WX/CZ       | A               | 12/9/1966             | 299               | 8.0              | 6.0              | 500.0            | 24.0              | 1181.00           |
| Gregg         | 3527102         | TNRIS              | WX/CZ       | B               | 12/12/1966            | 500               | 8.0              | 9.0              | 455.0            | 7.0               | 1018.00           |
| Gregg         | 3527401         | TNRIS              | WX/CZ       | A               | 12/16/1966            | 505               | 7.1              | 5.0              | 435.0            | 9.0               | 979.00            |
| Gregg         | 3533501         | TNRIS              | WX/CZ       | B               | 5/25/1975             | 762               | 8.5              | 2.0              | 92.0             | 4.0               | 763.13            |
| Gregg         | 3533001         | TNRIS              | WX/CZ       | A               | 2/23/1971             | 507               | 8.6              | 1.0              | 10.0             | 12.0              | 406.42            |
| Gregg         | 3533803         | TNRIS              | WX/CZ       | A               | 5/27/1972             | 388               | 8.5              | 1.0              | 9.0              | 13.0              | 375.41            |
| Gregg         | 3533901         | TNRIS              | WX/CZ       | B               | 4/12/1951             | 875               | --               | 12.0             | 699.0            | 23.0              | 1738.00           |
| Gregg         | 3533904         | TNRIS              | WX/CZ       | A               | 5/27/1975             | 528               | 8.5              | 1.0              | 9.0              | 23.0              | 414.34            |
| Gregg         | 3533908         | TNRIS              | WX/CZ       | A               | 5/27/1975             | 527               | 8.5              | 1.0              | 8.0              | 21.0              | 443.70            |
| Gregg         | 3534182         | TNRIS              | WX/CZ       | A               | 5/29/1975             | 389               | 8.5              | 2.0              | 104.0            | 4.0               | 757.70            |
| Gregg         | 3534202         | TNRIS              | WX/CZ       | A               | 5/29/1961             | 281               | 7.7              | 6.0              | 422.0            | 24.0              | 1064.00           |
| Gregg         | 3534401         | TNRIS              | WX/CZ       | A               | 12/2/1965             | 190               | 8                | 5.0              | 16.0             | 31.0              | 549.00            |
| Gregg         | 35354404        | TNRIS              | WX/CZ       | B               | 12/8/1966             | 911               | 8.8              | 4.0              | 960.0            | 86.0              | 2244.00           |
| Gregg         | 3534602         | TNRIS              | WX/CZ       | A               | 12/2/1966             | 300               | 7.7              | 12.0             | 27.0             | 150.0             | 514.00            |
| Gregg         | 3535701         | TNRIS              | WX/CZ       | B               | 5/27/1975             | 464               | 8.8              | 2.0              | 65.0             | 32.0              | 665.55            |
| Gregg         | 3535901         | TNRIS              | WX/CZ       | A               | 5/30/1981             | 183               | 7.9              | 5.0              | 23.0             | 9.0               | 400.00            |
| Gregg         | 3535902         | TNRIS              | WX/CZ       | A               | 12/1/1966             | 183               | 8                | 5.0              | 23.0             | 15.0              | 413.00            |
| Gregg         | 3536701         | TNRIS              | WX/CZ       | A               | 7/24/1970             | 39                | 7.2              | 65.0             | 20.0             | 11.0              | 276.00            |
|               |                 |                    |             |                 |                       |                   |                  |                  |                  |                   |                   |
| Harrison      | 3528402         | TNRIS              | WX          | B               | 7/2/1964              | 850               | 7.4              | 6.0              | 221.0            | 11.0              | 633.64            |
| Harrison      | 3522708         | TNRIS              | WX          | B               | 7/28/1976             | 400               | 8.2              | 3.0              | 45.0             | 24.0              | 537.69            |
| Harrison      | 3528983         | TNRIS              | WX          | A               | 2/10/1972             | 272               | 6.8              | 12.0             | 21.0             | 80.8              | 240               |
| Harrison      | 3538702         | TNRIS              | WX          | B               | 6/26/1973             | 351               | 7.1              | 12.0             | 22.0             | 4.0               | 65.87             |
| Harrison      | 3536705         | TNRIS              | WX          | B               | 6/14/1977             | 225               | 7.6              | 10.0             | 33.0             | 13.0              | 248.57            |
| Harrison      | 3530805         | TNRIS              | WX          | A               | 2/8/1977              | 24                | 5.8              | 2.0              | 8.0              | 4.6               | 35.05             |
| Harrison      | 3530806         | TNRIS              | WX          | A               | 2/8/1977              | 45                | 6.2              | 9.0              | 15.0             | 4.0               | 28.28             |
| Harrison      | 3531602         | TNRIS              | WX          | B               | 7/28/1976             | 185               | 7.6              | 56.0             | 37.0             | 15.0              | 373.99            |
| Harrison      | 3539401         | TNRIS              | WX          | A               | 6/15/1970             | 35                | 7.4              | 41.6             | 64.0             | 30.3              | 293               |
| Harrison      | 3539404         | TNRIS              | WX          | B               | 7/29/1976             | 494               | 8.3              | 7.0              | 22.0             | 12.0              | 416.83            |
| Harrison      | 3540502         | TNRIS              | WX          | B               | 10/20/1954            | 158               | 8.8              | 10.0             | 585.0            | 0.0               | 458.13            |
| Harrison      | 3540507         | TNRIS              | WX          | B               | 6/14/1977             | 145               | 7.6              | 34.0             | 44.0             | 64.0              | 394.86            |
| Harrison      | 3516202         | TNRIS              | WX          | B               | 6/15/1970             | 147               | 8.1              | 8.0              | 11.0             | 6.0               | 314               |
| Harrison      | 3517201         | TNRIS              | WX          | B               | 8/11/1964             | 310               | 7.8              | 2.0              | 24.0             | 0.0               | 286.55            |
|               |                 |                    |             |                 |                       |                   |                  |                  |                  |                   |                   |
| Marion        | 3512502         | TNRIS              | WX          | B               | 7/21/1977             | 832               | 8.4              | 4.0              | 309.0            | 4.0               | 983.98            |
| Marion        | 3513704         | TNRIS              | WX/CZ       | A               | 4/11/1968             | 720               | 8.5              | 2.0              | 212.0            | 0.0               | 849.58            |
| Marion        | 3514401         | TNRIS              | WX/CZ       | B               | 6/4/1968              | 485               | 8.4              | 2.0              | 245.0            | 0.0               | 927.83            |
| Marion        | 3514504         | TNRIS              | WX          | B               | 5/31/1968             | 840               | 8.4              | 5.0              | 700.0            | 0.0               | 1639.63           |
| Marion        | 3514703         | TNRIS              | WX/CZ       | B               | 2/5/1973              | 797               | 7.5              | 13.0             | 36.0             | 40.0              | 168.16            |
| Marion        | 3515502         | TNRIS              | WX          | B               | 7/20/1977             | 285               | 8.2              | 13.0             | 37.0             | 138.0             | 584.79            |
| Marion        | 3516403         | TNRIS              | WX          | B               | 4/18/1988             | 509               | 8.1              | 4.0              | 325.0            | 0.0               | 1075.12           |
| Marion        | 3521301         | TNRIS              | WX/CZ       | A               | 7/20/1977             | 348               | 8.1              | 2.0              | 336.0            | 4.0               | 1008.95           |
|               |                 |                    |             |                 |                       |                   |                  |                  |                  |                   |                   |

**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| County      | Well No. | Data Source | Unit  | Interval | Date Collected | Depth (ft) | pH (s.u.) | Ca (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) |
|-------------|----------|-------------|-------|----------|----------------|------------|-----------|-----------|-----------|------------|------------|
| Nacogdoches | 22005    | DOE         | WX/CZ | A        | 10/27/1978     | 43         | 6.6       | 13.5      | 10.0      | 5.0        | 106.32     |
| Nacogdoches | 22024    | DOE         | WX/CZ | A        | 10/27/1978     | 52         | 8.3       | 1.5       | 10.0      | 5.0        | 544.82     |
| Nacogdoches | 22040    | DOE         | WX/CZ | A        | 11/3/1978      | 348        | 8.4       | 0.5       | 10.0      | 5.0        | 616.27     |
| Nacogdoches | 22041    | DOE         | WX/CZ | A        | 11/3/1978      | 23         | 7.0       | 34.6      | 37.0      | 5.0        | 238.65     |
| Nacogdoches | 22055    | DOE         | WX/CZ | A        | 11/4/1978      | 66         | 5.9       | 10.2      | 10.0      | 5.0        | 74.56      |
| Nacogdoches | 3709502  | TNRIS       | CZ    | A        | 8/13/1975      | 285        | 7.8       | 23.0      | 11.0      | 23.0       | 140.36     |
| Nacogdoches | 3710302  | TNRIS       | WX    | A        | 8/12/1975      | 91         | 7.6       | 111.0     | 186.0     | 254.0      | 802.91     |
| Nacogdoches | 3710703  | TNRIS       | CZ    | A        | 1/10/1969      | 242        | 7.0       | 9.0       | 12.0      | 29.0       | 169.23     |
| Nacogdoches | 3711682  | TNRIS       | WX    | A        | 12/6/1968      | 294        | 6.7       | 7.0       | 5.0       | 4.0        | 62.01      |
| Nacogdoches | 3711603  | TNRIS       | CZ    | A        | 8/13/1975      | 42         | 6.3       | 19.0      | 15.0      | 4.0        | 185.91     |
| Nacogdoches | 3711604  | TNRIS       | WX    | A        | 12/6/1968      | 345        | 7.4       | 49.0      | 16.0      | 46.0       | 278.42     |
| Nacogdoches | 3711807  | TNRIS       | CZ    | A        | 1/9/1969       | 100        | 7.8       | 4.0       | 10.0      | 30.3       | 293.06     |
| Nacogdoches | 3711901  | TNRIS       | WX    | A        | 8/13/1975      | 463        | 8.1       | 3.0       | 9.0       | 27.0       | 294.52     |
| Nacogdoches | 3711906  | TNRIS       | WX    | A        | 12/13/1968     | 565        | 8.0       | 4.0       | 6.0       | 19.0       | 353.39     |
| Nacogdoches | 9712804  | TNRIS       | WX    | A        | 1/8/1969       | 373        | 8.6       | 2.0       | 4.0       | 11.0       | 336.13     |
| Nacogdoches | 3712903  | TNRIS       | WX    | A        | 12/9/1968      | 170        | 7.1       | 43.0      | 6.0       | 56.0       | 247.26     |
| Nacogdoches | 3712904  | TNRIS       | WX    | A        | 12/9/1968      | 237        | 8.2       | 2.0       | 15.0      | 52.0       | 335.08     |
| Nacogdoches | 3713702  | TNRIS       | WX    | A        | 12/4/1968      | 200        | 8.1       | 19.0      | 31.0      | 172.0      | 557.45     |
| Nacogdoches | 3717203  | TNRIS       | CZ    | A        | 1/9/1969       | 397        | 6.1       | 38.0      | 47.0      | 30.0       | 442.80     |
| Nacogdoches | 3717607  | TNRIS       | CZ    | A        | 9/27/1964      | 460        | 6.4       | 18.0      | 18.0      | 122.0      | 292.37     |
| Nacogdoches | 3717608  | TNRIS       | CZ    | A        | 1/13/1969      | 267        | 8.1       | 5.0       | 9.0       | 52.0       | 493.62     |
| Nacogdoches | 3718202  | TNRIS       | WX    | A        | 12/19/1968     | 540        | 8.3       | 3.0       | 3.0       | 5.0        | 476.08     |
| Nacogdoches | 3718206  | TNRIS       | CZ    | A        | 1/4/1969       | 408        | 6.5       | 21.0      | 20.0      | 72.0       | 194.35     |
| Nacogdoches | 3718406  | TNRIS       | CZ    | A        | 1/10/1969      | 438        | 6.9       | 34.0      | 16.0      | 143.0      | 356.28     |
| Nacogdoches | 3718407  | TNRIS       | CZ    | A        | 1/13/1969      | 500        | 8.0       | 4.0       | 11.0      | 66.0       | 308.64     |
| Nacogdoches | 3719301  | TNRIS       | CZ    | A        | 8/12/1975      | 340        | 7.6       | 56.0      | 16.0      | 55.0       | 230.81     |
| Nacogdoches | 3719401  | TNRIS       | CZ    | A        | 8/13/1975      | 580        | 7.1       | 11.0      | 12.0      | 30.0       | 149.99     |
| Nacogdoches | 3719601  | TNRIS       | CZ    | A        | 1/7/1968       | 400        | 6.5       | 11.0      | 8.0       | 26.0       | 109.00     |
| Nacogdoches | 3720103  | TNRIS       | WX    | A        | 12/31/1968     | 500        | 8.5       | 4.0       | 10.0      | 12.0       | 205.22     |
| Nacogdoches | 3720703  | TNRIS       | CZ    | A        | 1/15/1969      | 425        | 7.1       | 15.0      | 16.0      | 65.0       | 177.17     |
| Nacogdoches | 3720704  | TNRIS       | CZ    | A        | 1/15/1969      | 400        | 7.1       | 17.0      | 15.0      | 65.0       | 174.62     |
| Nacogdoches | 3720803  | TNRIS       | CZ    | A        | 1/15/1969      | 500        | 8.1       | 6.0       | 18.0      | 55.0       | 439.88     |
| Nacogdoches | 3720804  | TNRIS       | WX    | A        | 1/21/1969      | 425        | 7.5       | 3.0       | 4.0       | 12.0       | 285.45     |
| Nacogdoches | 3720902  | TNRIS       | WX    | A        | 8/12/1975      | 630        | 8.2       | 3.0       | 6.0       | 13.0       | 402.93     |
| Nacogdoches | 3721801  | TNRIS       | WX    | A        | 1/9/1969       | 392        | 8.0       | 7.0       | 16.0      | 111.0      | 389.29     |
| Nacogdoches | 3727101  | TNRIS       | CZ    | A        | 2/3/1969       | 444        | 7.0       | 1.0       | 10.0      | 20.0       | 168.00     |
| Nacogdoches | 3727201  | TNRIS       | CZ    | A        | 8/12/1975      | 502        | 7.4       | 1.0       | 9.0       | 17.0       | 160.45     |
| Nacogdoches | 3727303  | TNRIS       | CZ    | A        | 6/25/1947      | 518        | 6.8       | 2.0       | 52.0      | 22.0       | 237.94     |
| Nacogdoches | 3727803  | TNRIS       | CZ    | A        | 12/12/1968     | 660        | 8.7       | 2.0       | 6.0       | 26.0       | 575.68     |
| Nacogdoches | 3727804  | TNRIS       | CZ    | A        | 12/12/1988     | 600        | 8.7       | 2.0       | 6.0       | 25.0       | 573.48     |
| Nacogdoches | 3728303  | TNRIS       | WX/CZ | A        | 7/8/1966       | 300        | 7.2       | 7.0       | 11.0      | 16.0       | 197.15     |
| Nacogdoches | 3728304  | TNRIS       | WX/CZ | A        | 6/8/1966       | 347        | 7.4       | 7.0       | 11.0      | 38.0       | 163.65     |
| Nacogdoches | 3728902  | TNRIS       | CZ    | A        | 8/12/1975      | 500        | 7.6       | 2.0       | 11.0      | 47.0       | 242.83     |
| Nacogdoches | 3729202  | TNRIS       | WX/CZ | A        | 7/5/1961       | 274        | 7.1       | 12.0      | 11.0      | 48.0       | 341.53     |
| Nacogdoches | 3729402  | TNRIS       | CZ    | A        | 8/12/1975      | 352        | 7.8       | 1.0       | 12.0      | 20.0       | 173.53     |
| Nacogdoches | 3729501  | TNRIS       | CZ    | A        | 1/9/1969       | 448        | 7.8       | 2.0       | 11.0      | 64.0       | 253.45     |
| Nacogdoches | 3729801  | TNRIS       | CZ    | A        | 1/8/1969       | 450        | 8.3       | 2.0       | 5.0       | 25.0       | 227.09     |
| Nacogdoches | 3736303  | TNRIS       | CZ    | A        | 12/11/1968     | 590        | 8.3       | 1.0       | 5.0       | 14.0       | 224.94     |
|             |          |             |       |          |                |            |           |           |           |            |            |



**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| <b>County</b> | <b>Well No.</b> | <b>Data Source</b> | <b>Unit</b> | <b>Interval</b> | <b>Date Collected</b> | <b>Depth (ft)</b> | <b>pH (s.u.)</b> | <b>Ca (mg/L)</b> | <b>Cl (mg/L)</b> | <b>SO4 (mg/L)</b> | <b>TDS (mg/L)</b> |
|---------------|-----------------|--------------------|-------------|-----------------|-----------------------|-------------------|------------------|------------------|------------------|-------------------|-------------------|
| Panola        | HTS-3B          | BEG                | WX          | B               | 8/23/1983             | 190               | 8.5              | 3.6              | 19.2             | 14.0              | 560.00            |
| Panola        | 3544603         | TNRIS              | WX          | B               | 6/23/1977             | 567               | 8.5              | 2.0              | 239.0            | 4.0               | 1038.3            |
| Panola        | 3545701         | TNRIS              | WX          | B               | 5/23/1977             | 396               | 8.5              | 2.0              | 147.0            | 4.0               | 818.27            |
| Panola        | 3548702         | TNRIS              | WX          | B               | 7/25/1972             | 226               | 6.3              | 5.0              | 13.0             | 3.0               | 127.00            |
| Panola        | 3547502         | TNRIS              | WX          | B               | 6/21/1977             | 304               | 8.0              | 9.0              | 39.0             | 4.0               | 275.26            |
| Panola        | 3547502         | TNRIS              | WX          | B               | 5/11/1961             | 182               | 7.0              | 21.0             | 40.0             | 5.0               | 267.00            |
| Panola        | 3548106         | TNRIS              | WX          | B               | 6/21/1977             | 162               | 7.6              | 29.0             | 35.0             | 4.0               | 282.40            |
| Panola        | 3552301         | TNRIS              | WX          | B               | 6/24/1977             | 320               | 8.2              | 3.0              | 118.0            | 10.0              | 751.53            |
| Panola        | 3553201         | TNRIS              | WX          | B               | 11/00/45              | 280               | 8.5              | 2.0              | 89.0             | 0.0               | 912.00            |
| Panola        | 3553701         | TNRIS              | WX          | B               | 6/23/1977             | 33                | 6.7              | 9.0              | 47.0             | 28.0              | 238.70            |
| Panola        | 3553702         | TNRIS              | WX          | B               | 6/24/1977             | 389               | 8.3              | 5.0              | 8.0              | 12.0              | 250.73            |
| Panola        | 3553902         | TNRIS              | WX          | B               | 6/23/1977             | 337               | 7.7              | 18.0             | 15.0             | 4.0               | 236.14            |
| Panola        | 3554601         | TNRIS              | WX          | B               | 8/3/1972              | 40                | 6.6              | 9.0              | 21.0             | 4.0               | 107.81            |
| Panola        | 3554702         | TNRIS              | WX          | B               | 7/24/1972             | 257               | 7.4              | 7.0              | 27.0             | 4.0               | 247.00            |
| Panola        | 3554703         | TNRIS              | WX          | B               | 6/22/1977             | 320               | 8.0              | 9.0              | 26.0             | 4.0               | 261.64            |
| Panola        | 3554704         | TNRIS              | WX          | B               | 5/20/1951             | 242               | 8.0              | 8.0              | 31.0             | 0.0               | 273.63            |
| Panola        | 3554706         | TNRIS              | WX          | B               | 4/00/1958             | 265               | 6.6              | 40.0             | 37.0             | 7.0               | 279.67            |
| Panola        | 3556401         | TNRIS              | WX          | B               | 6/21/1977             | 220               | 8.1              | 6.0              | 30.0             | 4.0               | 287.96            |
| Panola        | 3560502         | TNRIS              | WX          | A               | 6/23/1977             | 190               | 7.8              | 4.0              | 18.0             | 26.0              | 323.40            |
| Panola        | 3561303         | TNRIS              | WX          | B               | 6/24/1977             | 290               | 8.4              | 5.0              | 122.0            | 5.0               | 645.80            |
| Panola        | 3561305         | TNRIS              | WX          | B               | 6/24/1977             | 327               | 8.6              | 2.0              | 328.0            | 4.0               | 1096.93           |
| Panola        | 3561306         | TNRIS              | WX          | B               | 6/24/1977             | 285               | 8.3              | 2.0              | 193.0            | 10.0              | 881.45            |
| Panola        | 3562501         | TNRIS              | WX          | B               | 6/20/1977             | 292               | 8.0              | 6.0              | 357.0            | 4.0               | 1195.25           |
| Panola        | 3562502         | TNRIS              | WX          | B               | 6/20/1977             | 40                | 7.0              | 21.0             | 6.0              | 6.0               | 90.46             |
| Panola        | 3563701         | TNRIS              | WX          | A               | 6/22/1977             | 40                | 7.1              | 29.0             | 93.0             | 25.0              | 350.57            |
| Panola        | 3704301         | TNRIS              | WX          | A               | 8/2/1972              | 80                | 7.6              | 157.0            | 212.0            | 284.0             | 1033.13           |
| Panola        | 3705201         | TNRIS              | WX          | A               | 6/20/1977             | 45                | 6.7              | 48.0             | 129.0            | 178.0             | 616.31            |
|               |                 |                    |             |                 |                       |                   |                  |                  |                  |                   |                   |
| Rusk          | 22059           | DOE                | WX/CZ       | A               | 11/4/1978             | 348               | 7.4              | 32.3             | 29.0             | 9.0               | 408.23            |
| Rusk          | 22062           | DOE                | WX/CZ       | A               | 11/5/1978             | 299               | 7.7              | 33.9             | 24.0             | 12.0              | 344.20            |
| Rusk          | 22065           |                    | WX/CZ       | A               | 11/5/1978             | 33                | 6.9              | 6.5              | 20.0             | 18.0              | 174.03            |
| Rusk          | 3541803         | TNRIS              | WX          | B               | 8/26/1977             | 599               | 8.2              | 2.0              | 5.0              | 19.0              | 337.98            |
| Rusk          | 3542202         | TNRIS              | WX/CZ       | B               | 10/1/1976             | 750               | 8.2              | 4.0              | 8.0              | 4.0               | 526.98            |
| Rusk          | 3542801         | TNRIS              | WX          | A               | 9/21/1972             | 67                | 6.5              | 16.0             | 6.0              | 12.0              | 95.26             |
| Rusk          | 3543501         | TNRIS              | WX/CZ       | A               | 10/1/1976             | 220               | 7.9              | 23.0             | 9.0              | 34.0              | 200.14            |
| Rusk          | 3544601         | TNRIS              | WX          | B               | 7/29/1977             | 427               | 8.0              | 1.0              | 216.0            | 4.0               | 982.83            |
| Rusk          | 3549502         | TNRIS              | WX/CZ       | B               | 9/20/1972             | 585               | 7.8              | 2.0              | 7.0              | 32.0              | 482.73            |
| Rusk          | 3549801         | TNRIS              | WX          | A               | 9/18/1972             | 291               | 7.7              | 1.0              | 12.0             | 5.0               | 494.08            |
| Rusk          | 3550302         | TNRIS              | WX          | A               | 7/29/1977             | 49                | 6.6              | 26.0             | 90.0             | 16.0              | 287.96            |
| Rusk          | 3550501         | TNRIS              | WX          | A               | 9/21/1972             | 48                | 7.0              | 19.0             | 9.0              | 4.0               | 42.64             |
| Rusk          | 3550801         | TNRIS              | WX/CZ       | B               | 6/30/1977             | 624               | 8.3              | 2.0              | 18.0             | 8.0               | 274.72            |
| Rusk          | 3550905         | TNRIS              | WX          | B               | 2/19/1955             | 668               | 8.0              | 3.0              | 16.0             | 21.0              | 262.00            |
| Rusk          | 3550966         | TNRIS              | WX          | B               | 6/30/1977             | 752               | 8.2              | 4.0              | 6.0              | 10.0              | 279.25            |
| Rusk          | 3551602         | TNRIS              | WX          | B               | 7/29/1977             | 810               | 7.8              | 31.0             | 23.0             | 38.0              | 307.69            |
| Rusk          | 3552101         | TNRIS              | WX          | A               | 6/30/1977             | 192               | 8.6              | 1.0              | 9.0              | 17.0              | 451.17            |
| Rusk          | 3552701         | TNRIS              | WX          | A               | 6/30/1977             | 392               | 7.8              | 47.0             | 37.0             | 152.0             | 450.89            |
| Rusk          | 3557602         | TNRIS              | WX/CZ       | B               | 9/30/1976             | 658               | 7.7              | 3.0              | 10.0             | 11.0              | 189.74            |
| Rusk          | 3557901         | TNRIS              | WX          | A               | 9/19/1972             | 315               | 8.4              | 4.0              | 17.0             | 29.0              | 453.41            |
| Rusk          | 3558101         | TNRIS              | WX/CZ       | A               | 6/30/1977             | 31                | 7.6              | 37.0             | 12.0             | 4.0               | 143.63            |
| Rusk          | 3558401         | TNRIS              | WX/CZ       | A               | 9/20/1972             | 82                | 7.2              | 43.0             | 7.0              | 58.0              | 181.49            |
| Rusk          | 3558601         | TNRIS              | WX          | A               | 7/1/1977              | 292               | 8.2              | 5.0              | 9.0              | 36.0              | 397.99            |
| Rusk          | 3559201         | TNRIS              | WX          | A               | 7/1/1977              | 36                | 7.5              | 33.0             | 5.0              | 4.0               | 155.17            |
| Rusk          | 3559801         | TNRIS              | WX          | A               | 7/6/1961              | 412               | 7.0              | 35.0             | 19.0             | 19.0              | 297.00            |
| Rusk          | 3559902         | TNRIS              | WX          | A               | 7/1/1977              | 480               | 8.3              | 3.9              | 5.0              | 12.0              | 299.62            |
| Rusk          | 3560101         | TNRIS              | WX          | A               | 7/29/1961             | 190               | 7.2              | 9.0              | 10.0             | 20.0              | 233.62            |
| Rusk          | 3702301         | TNRIS              | WX          | A               | 9/28/1976             | 280               | 8.7              | 3.0              | 5.0              | 11.0              | 219.89            |
| Rusk          | 3702801         | TNRIS              | WX/CZ       | A               | 9/27/1972             | 850               | 8.6              | 2.0              | 10.0             | 4.0               | 550.8             |

**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| County | Well No. | Data Source | Unit  | Interval | Date Collected | Depth (ft) | pH (s.u.) | Ca (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) |
|--------|----------|-------------|-------|----------|----------------|------------|-----------|-----------|-----------|------------|------------|
| Rusk   | 3702802  | TNRIS       | WX/CZ | A        | 7/1/1977       | 430        | 7.5       | 4.0       | 7.0       | 16.0       | 163.04     |
| Rusk   | 3703502  | TNRIS       | WX/CZ | A        | 7/1/1977       | 666        | 6.3       | 11.0      | 14.0      | 65.0       | 160.48     |
| Rusk   | 3704661  | TNRIS       | WX/CZ | A        | 7/1/1977       | 315        | 8.3       | 2.0       | 10.0      | 16.0       | 293.35     |
| Rusk   | 3711101  | TNRIS       | WX    | A        | 9/27/1976      | 59         | 7.2       | 42.0      | 9.0       | 4.0        | 134.48     |
|        |          |             |       |          |                |            |           |           |           |            |            |
| Sabine | 3625802  | TNRIS       | WX/CZ | A        | 7/17/1976      | 50         | 6.2       | 8.0       | 8.0       | 4.0        | 99.72      |
| Sabine | 3634303  | TNRIS       | WX/CZ | A        | 7/21/1971      | 30         | 6.3       | 9.0       | 6.0       | 3.0        | 73.00      |
| Sabine | 3634501  | TNRIS       | WX/CZ | A        | 5/9/1942       | 881        | --        | 1.0       | 22.0      | 0.0        | 542.90     |
| Sabine | 3738502  | TNRIS       | WX/CZ | A        | 7/12/1976      | 285        | 8.1       | 7.0       | 243.0     | 4.0        | 114.88     |
| Sabine | 3731703  | TNRIS       | WX    | A        | 7/12/1976      | 315        | 7.3       | 9.0       | 11.0      | 55.0       | 211.52     |
| Sabine | 3732701  | TNRIS       | WX    | A        | 5/6/1942       | 600        | --        | 1.0       | 7.0       | 6.0        | 865.00     |
| Sabine | 3732708  | TNRIS       | WX    | A        | 5/17/1942      | 512        | --        | 3.0       | 8.0       | 43.0       | 444.00     |
| Sabine | 3738501  | TNRIS       | WX/CZ | A        | 2/8/1972       | 510        | 8.2       | 3.0       | 108.0     | 4.0        | 880.82     |
| Sabine | 3739061  | TNRIS       | WX    | A        | 7/13/1976      | 420        | 7.9       | 5.0       | 10.0      | 4.0        | 485.78     |
| Sabine | 3740302  | TNRIS       | WX/CZ | A        | 7/13/1976      | 219        | 7.7       | 47.0      | 10.0      | 104.0      | 355.73     |
|        |          |             |       |          |                |            |           |           |           |            |            |
| Shelby | HTS-1-SA | BEG         | WX/CZ | B        | 8/17/1983      | 361        | 8.7       | 1.0       | 10.5      | 22.0       | 880.00     |
| Shelby | 22010    | DOE         | WX/CZ | A        | 10/25/1978     | 26         | 5.3       | 36.4      | 44.0      | 231.0      | 661.30     |
| Shelby | 22020    | DOE         | WX/CZ | A        | 10/28/1978     | 197        | 7.3       | 128.4     | 102.0     | 294.0      | 1171.71    |
| Shelby | 22036    | DOE         | WX/CZ | A        | 10/31/1978     | 299        | 8.4       | 0.8       | 25.0      | 61.0       | 846.82     |
| Shelby | 22044    | DOE         | WX/CZ | A        | 11/3/1978      | 246        | 8.2       | 3.6       | 15.0      | 44.0       | 513.33     |
| Shelby | 22299    | DOE         | WX/CZ | A        | 11/7/1978      | 43         | 7.0       | 922.0     | 354.0     | 344.0      | 1671.12    |
| Shelby | 22452    | DOE         | WX/CZ | A        | 11/28/1978     | 33         | 5.5       | 13.2      | 10.0      | 31.0       | 251.11     |
| Shelby | 22470    | DOE         | WX/CZ | B        | 11/10/1978     | 292        | 7.1       | 34.0      | 27.0      | 5.0        | 523.00     |
| Shelby | 22471    | DOE         | WX/CZ | A        | 11/11/1978     | 75         | 5.9       | 44.8      | 100.8     | 300.0      | 943.07     |
| Shelby | 22473    | DOE         | WX/CZ | A        | 11/11/1978     | 23         | 4.5       | 22.0      | 49.5      | 14.0       | 363.12     |
| Shelby | 22684    | DOE         | WX/CZ | B        | 12/2/1978      | 492        | 7.8       | 5.9       | 10.8      | 7.0        | 524.19     |
| Shelby | 3616701  | TNRIS       | WX    | A        | 7/28/1977      | 206        | 7.6       | 21.0      | 41.0      | 34.0       | 196.00     |
| Shelby | 3617501  | TNRIS       | WX    | A        | 5/11/1961      | 200        | 8.0       | 3.0       | 46.0      | 17.0       | 404.00     |
| Shelby | 3617502  | TNRIS       | WX    | A        | 9/1/1972       | 31         | 7.2       | 13.0      | 8.0       | 6.0        | 161.16     |
| Shelby | 3617002  | TNRIS       | WX    | B        | 7/28/1977      | 50         | 7.0       | 13.0      | 12.0      | 5.0        | 169.16     |
| Shelby | 3705701  | TNRIS       | WX    | B        | 7/29/1977      | 59         | 7.3       | 37.0      | 91.0      | 47.0       | 431.05     |
| Shelby | 3765902  | TNRIS       | WX    | B        | 2/8/1973       | 430        | 7.4       | 3.0       | 32.0      | 4.0        | 287.60     |
| Shelby | 3786401  | TNRIS       | WX    | B        | 8/30/1972      | 170        | 8.4       | 5.0       | 11.0      | 15.0       | 414.75     |
| Shelby | 3707202  | TNRIS       | WX    | B        | 8/30/1972      | 150        | 8.0       | 48.0      | 45.0      | 30.0       | 466.93     |
| Shelby | 3707401  | TNRIS       | WX    | B        | 7/29/1977      | 519        | 8.4       | 1.0       | 207.0     | 4.0        | 966.19     |
| Shelby | 3708601  | TNRIS       | WX    | A        | 8/31/1972      | 330        | 8.2       | 3.0       | 720.0     | 4.0        | 1942.37    |
| Shelby | 3708604  | TNRIS       | WX    | A        | 9/1/1972       | 39         | 7.2       | 22.0      | 6.0       | 4.0        | 131.42     |
| Shelby | 3708701  | TNRIS       | WX    | A        | 7/28/1977      | 139        | 8.2       | 1.0       | 11.0      | 4.0        | 499.61     |
| Shelby | 3708801  | TNRIS       | WX    | A        | 8/29/1972      | 39         | 7.5       | 26.0      | 11.0      | 4.0        | 124.32     |
| Shelby | 3713602  | TNRIS       | WX    | A        | 8/30/1972      | 51         | 7.2       | 159.0     | 134.0     | 1570.0     | 2536.81    |
| Shelby | 3713603  | TNRIS       | WX    | B        | 7/29/1977      | 118        | 8.1       | 14.0      | 23.0      | 62.0       | 428.87     |
| Shelby | 3714201  | TNRIS       | WX    | A        | 7/29/1977      | 55         | 7.3       | 28.0      | 9.0       | 17.0       | 155.20     |
| Shelby | 3714501  | TNRIS       | WX    | A        | 7/29/1977      | 58         | 7.0       | 27.0      | 60.0      | 11.0       | 281.23     |
| Shelby | 3714701  | TNRIS       | WX    | A        | 7/29/1977      | 74         | 7.9       | 54.0      | 127.0     | 27.0       | 677.03     |
| Shelby | 3715101  | TNRIS       | WX    | A        | 4/5/1960       | 474        | 8.6       | 5.0       | 34.0      | 51.0       | 711.00     |
| Shelby | 3715461  | TNRIS       | WX    | A        | 8/29/1972      | 48         | 6.3       | 10.0      | 47.0      | 41.0       | 286.50     |
| Shelby | 3715501  | TNRIS       | WX    | A        | 7/28/1977      | 35         | 6.7       | 8.0       | 13.0      | 16.0       | 162.31     |
| Shelby | 3716201  | TNRIS       | WX    | A        | 7/28/1977      | 59         | 7.6       | 19.0      | 12.0      | 17.0       | 159.65     |
| Shelby | 3716302  | TNRIS       | WX    | A        | 7/28/1977      | 25         | 7.4       | 22.0      | 71.0      | 22.0       | 267.46     |
| Shelby | 3716701  | TNRIS       | WX    | A        | 7/28/1977      | 42         | 6.6       | 21.0      | 53.0      | 13.0       | 250.52     |
| Shelby | 3724681  | TNRIS       | WX    | A        | 7/28/1977      | 60         | 7.4       | 48.0      | 21.0      | 108.0      | 401.33     |
| Shelby | 3732301  | TNRIS       | WX    | A        | 7/28/1977      | 50         | 7.5       | 38.0      | 32.0      | 32.0       | 295.65     |
|        |          |             |       |          |                |            |           |           |           |            |            |

**TABLE 1**  
**WATER WELL RECORDS FROM FOGG ET AL. (1991)**

| County                    | Well No. | Data Source | Unit  | Interval | Date Collected | Depth (ft) | pH (s.u.) | Ca (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) |
|---------------------------|----------|-------------|-------|----------|----------------|------------|-----------|-----------|-----------|------------|------------|
| Smith                     | 3428801  | TNRIS       | CZ    | A        | 3/16/1960      | 415        | 6.7       | 28.0      | 26.0      | 65.0       | 252.00     |
| Smith                     | 3429201  | TNRIS       | WX    | A        | 6/21/1976      | 774        | 7.9       | 3.0       | 16.0      | 24.0       | 343.16     |
| Smith                     | 3437101  | TNRIS       | WX/CZ | A        | 4/5/1962       | 800        | 7.4       | 10.0      | 16.0      | 28.0       | 274.00     |
| Smith                     | 3        | TNRIS       | WX    | B        | 5/16/1962      | 990        | 8.1       | 4374.1    | 13.0      | 21.0       | 266.00     |
| Smith                     | 3737901  | TNRIS       | CZ    | A        | 4/9/1962       | 747        | 6.9       | 12.0      | 4.0       | 10.0       | 114.00     |
| Smith                     | 3438302  | TNRIS       | WX    | B        | 10/7/1971      | 1269       | 8.1       | 3.0       | 362.0     | 4.0        | 1219.00    |
| Smith                     | 3439505  | TNRIS       | CZ    | A        | 6/29/1976      | 584        | 8.1       | 5.0       | 11.0      | 17.0       | 194.76     |
| Smith                     | 3440102  | TNRIS       | CZ    | A        | 6/29/1976      | 420        | 7.9       | 6.0       | 10.0      | 20.0       | 189.30     |
| Smith                     | 3445603  | TNRIS       | CZ    | A        | 6/24/1976      | 750        | 7.7       | 15.0      | 3.0       | 8.0        | 111.63     |
| Smith                     | 3445685  | TNRIS       | WX    | A        | 2/22/1961      | 940        | 8.0       | 2.0       | 25.0      | 25.0       | 374.00     |
| Smith                     | 3445803  | TNRIS       | WX    | A        | 6/24/1976      | 780        | 7.9       | 7.0       | 8.0       | 15.0       | 159.99     |
| Smith                     | 3446301  | TNRIS       | WX/CZ | A        | 8/6/1958       | 1078       | 7.2       | 83.0      | 167.0     | 202.0      | 679.03     |
| Smith                     | 3446501  | TNRIS       | WX/CZ | A        | 8/25/1954      | 1144       | --        | 4.0       | 18.0      | 10.0       | 250.00     |
| Smith                     | 3446701  | TNRIS       | CZ    | A        | 4/9/1952       | 913        | 7.2       | 8.0       | 4.0       | 8.0        | 110.00     |
| Smith                     | 3448801  | TNRIS       | CZ    | A        | 6/29/1976      | 715        | 7.7       | 12.0      | 18.0      | 24.0       | 199.79     |
| Smith                     | 3447205  | TNRIS       | CZ    | A        | 6/30/1976      | 707        | 8.0       | 2.0       | 7.0       | 7.0        | 241.70     |
| Smith                     | 3447401  | TNRIS       | CZ    | A        | 6/30/1976      | 673        | 8.2       | 5.0       | 3.0       | 10.0       | 157.37     |
| Smith                     | 3448201  | TNRIS       | WX/CZ | A        | 10/7/1952      | 738        | 8.4       | 5.0       | 10.0      | 19.0       | 261.00     |
| Smith                     | 3448802  | TNRIS       | CZ    | A        | 7/1/1976       | 531        | 8.5       | 1.0       | 5.0       | 13.0       | 324.87     |
| Smith                     | 3453201  | TNRIS       | CZ    | A        | 4/9/1962       | 992        | 7.5       | 8.0       | 8.0       | 16.0       | 183.00     |
| Smith                     | 3454201  | TNRIS       | CZ    | A        | 7/26/1976      | 990        | 8.5       | 7.0       | 6.0       | 10.0       | 168.47     |
| Smith                     | 3454602  | TNRIS       | CZ    | A        | 7/26/1976      | 818        | 8.7       | 2.0       | 10.0      | 12.0       | 325.11     |
| Smith                     | 3455802  | TNRIS       | CZ    | A        | 4/9/1962       | 200        | 7.8       | 1.0       | 10.0      | 61.0       | 267.00     |
| Smith                     | 3456207  | TNRIS       | CZ    | A        | 7/1/1976       | 505        | 8.3       | 1.0       | 18.0      | 99.0       | 394.04     |
| Smith                     | 3456401  | TNRIS       | WX    | B        | 6/2/1960       | 105        | 8.3       | 4.0       | 820.0     | 52.0       | 1958.00    |
| Smith                     | 3541701  | TNRIS       | CZ    | A        | 10/4/1971      | 290        | 6.5       | 7.0       | 20.0      | 43.0       | 142.00     |
|                           |          |             |       |          |                |            |           |           |           |            |            |
| Upshur                    | 3415902  | TNRIS       | WX    | A        | 1/16/1967      | 412        | 7.4       | 6.0       | 2.0       | 7.0        | 128.00     |
| Upshur                    | 3416801  | TNRIS       | WX    | B        | 8/25/1977      | 637        | 8.1       | 5.0       | 256.0     | 14.0       | 801.50     |
| Upshur                    | 3423602  | TNRIS       | WX    | B        | 1/6/1967       | 900        | 8.0       | 4.0       | 23.0      | 28.0       | 387.22     |
| Upshur                    | 3424202  | TNRIS       | WX/CZ | B        | 12/14/1977     | 460        | 8.1       | 5.0       | 25.0      | 30.0       | 319.98     |
| Upshur                    | 3432403  | TNRIS       | WX/CZ | A        | 4/28/1990      | 505        | 7.5       | 5.0       | 21.0      | 16.0       | 189.00     |
| Upshur                    | 3432501  | TNRIS       | WX/CZ | B        | 2/28/1961      | 607        | 6.9       | 16.0      | 1080.0    | 44.0       | 2018.00    |
| Upshur                    | 3509202  | TNRIS       | WX/CZ | A        | 8/25/1977      | 367        | 8.0       | 4.0       | 11.0      | 39.0       | 338.14     |
| Upshur                    | 3509401  | TNRIS       | WX/CZ | A        | 8/25/1977      | 330        | 7.9       | 4.0       | 18.0      | 34.0       | 286.05     |
| Upshur                    | 3509602  | TNRIS       | WX/CZ | A        | 3/29/1981      | 370        | 8.4       | 15.0      | 18.0      | 34.0       | 254.19     |
| Upshur                    | 3517103  | TNRIS       | WX/CZ | A        | 8/25/1977      | 400        | 8.3       | 3.0       | 18.0      | 36.0       | 280.29     |
| Upshur                    | 3517801  | TNRIS       | WX/CZ | A        | 1/31/1966      | 510        | 8.4       | 4.0       | 148.0     | 13.0       | 520.75     |
| Upshur                    | 3518702  | TNRIS       | WX/CZ | A        | 12/16/1933     | 610        | 7.7       | 8.0       | 340.0     | 26.0       | 838.00     |
| <b>Average:</b>           |          |             |       |          |                | 391        | 7.7       | 30.3      | 68.2      | 40.7       | 469        |
| <b>Standard Deviaton:</b> |          |             |       |          |                | 259        | 0.8       | 258       | 145       | 103        | 432        |
| <b>Maximum:</b>           |          |             |       |          |                | 1269       | 8.9       | 4374      | 1080      | 1570       | 4464       |
| <b>Minimum:</b>           |          |             |       |          |                | 23         | 4.5       | 0.10      | 2.0       | 0.00       | 28.3       |

**Notes:**

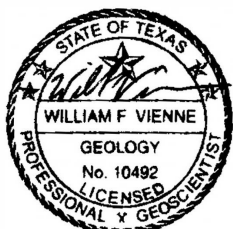
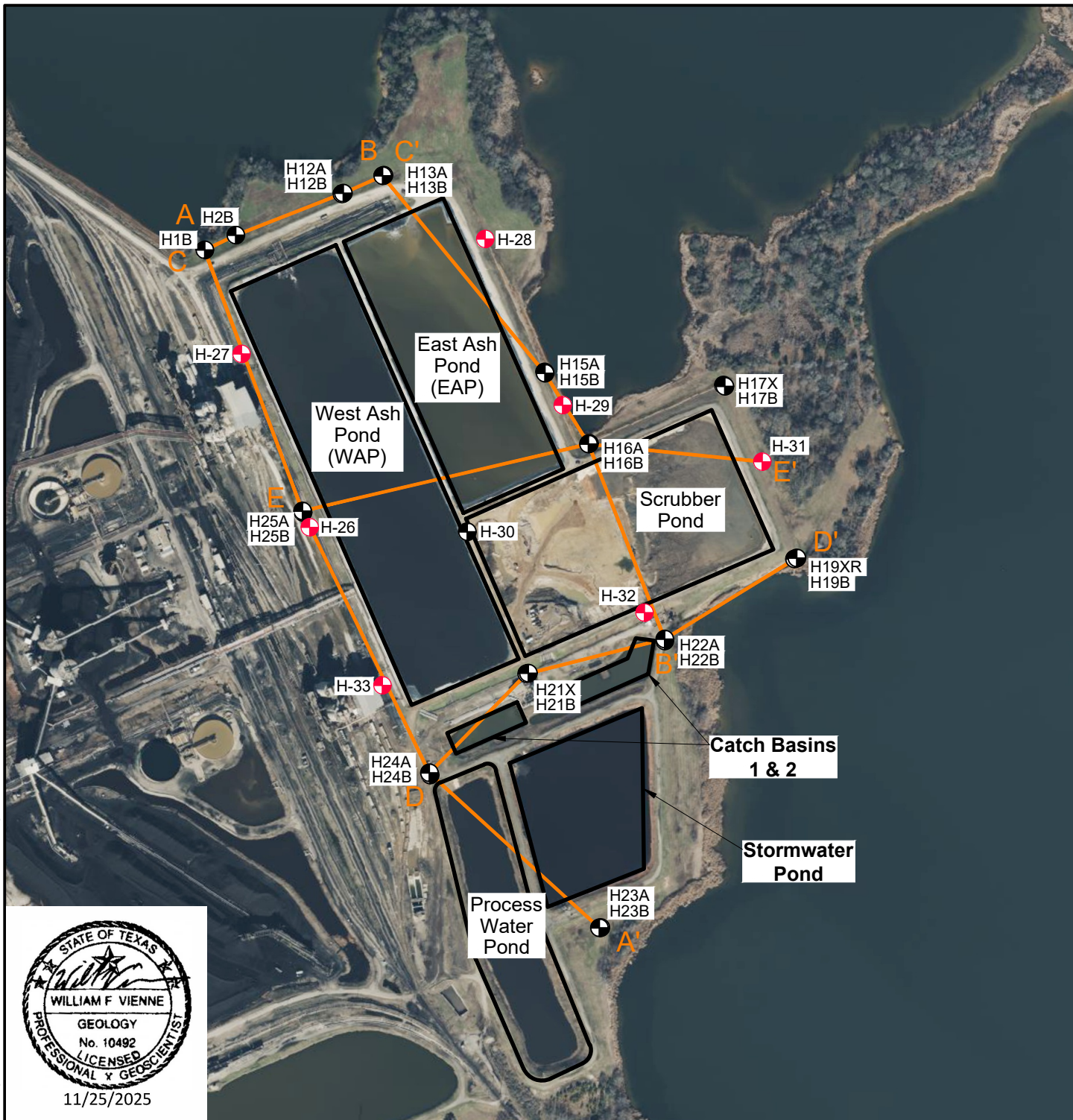
1. Wells in counties near Martin Lake SES with reported well depths < 100 feet are highlighted on this table and on the BEG Well Location Map (Figure 1).
2. Data is from Fogg et al. (1991). Data was sourced from Texas Natural Resources Information System/Texas Water Commission (TNRIS), U.S. Department of Energy (DOE), or TENRAC/BEG (BEG).
3. The DOE and BEG well IDs are assigned by those agencies. The TNRIS well IDs are state well numbers that use a grid-based location system:
  - First two digits identify the 1-degree quadrangle.
  - Next two digits identify the 7.5-minute quadrangle.
  - The fifth digit identifies the 2.5-minute quadrangle.
  - The last two digits are unique well identifiers.

**ATTACHMENT 7**

**Ash Pond Area Cross Sections and Associated Figures**



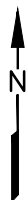
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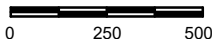
11/25/2025

### EXPLANATION

- Non-CCR Monitoring Well
- CCR Monitoring Well
- Geologic Cross Section Location Lines



Scale in Feet



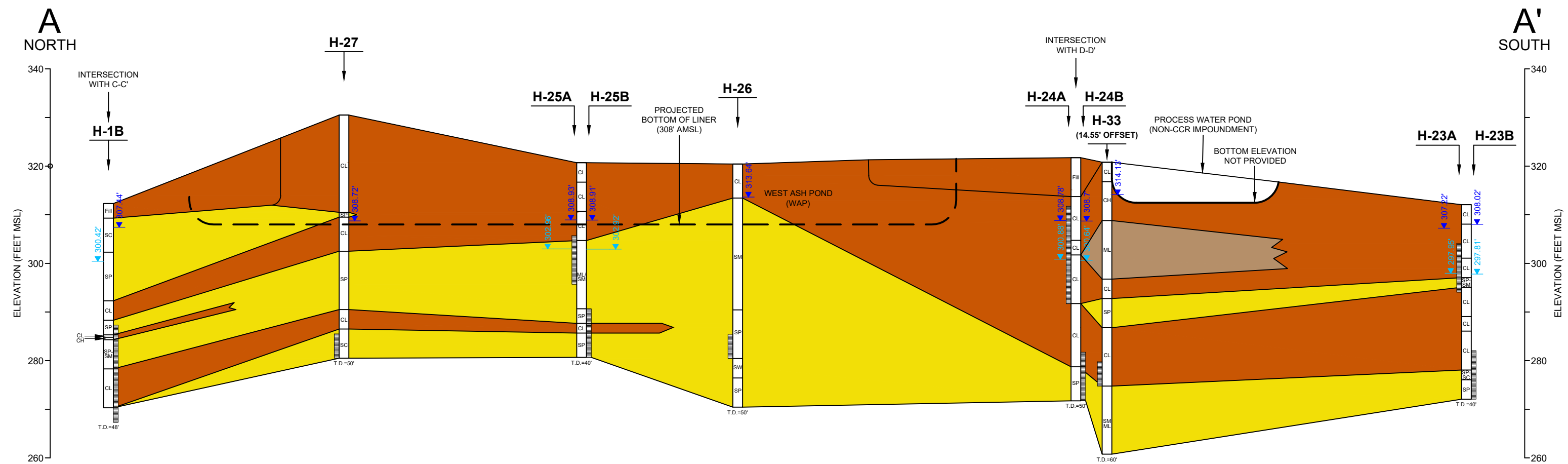
Aerial Source:  
2025 Microsoft Corporation; 2025 Maxar; CNES 2025 Distribution Airbus DS;  
2025 TMAP Mobility Earthstar Geographics SIO

**MARTIN LAKE STEAM ELECTRIC STATION**  
TATUM, TEXAS

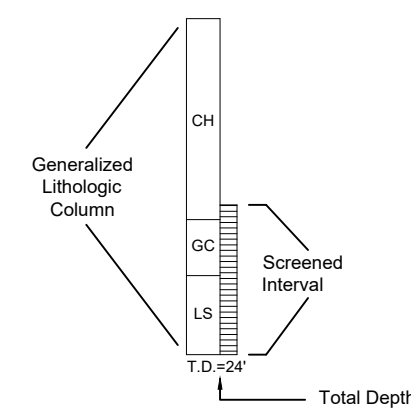
## Figure 2 ASH POND AREA GROUNDWATER MONITORING NETWORK

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

**Bullock, Bennett & Associates, LLC**  
Engineering and Geoscience  
Texas Registrations: Engineering F-8542, Geoscience 50127



#### MONITORING WELL CONSTRUCTION

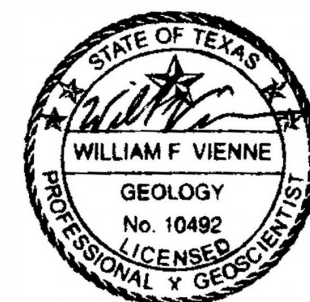
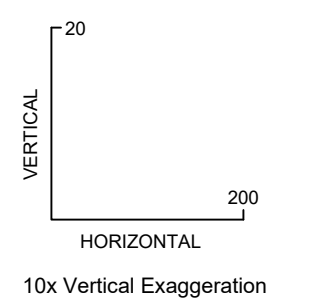


▲ Max. Observed Historical Water Level (Ft MSL)  
 ▼ Min. Observed Historical Water Level (Ft MSL)

#### EXPLANATION

SAND  
 CLAY  
 SILT

#### SCALE IN FEET



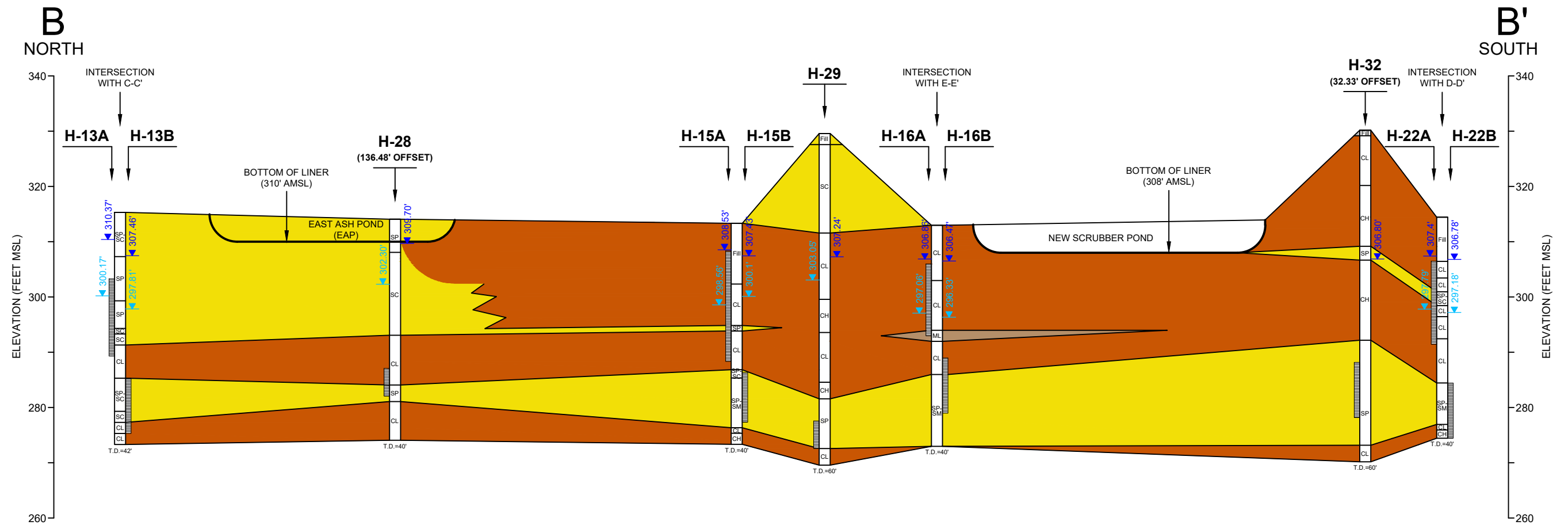
11/25/2025

#### MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

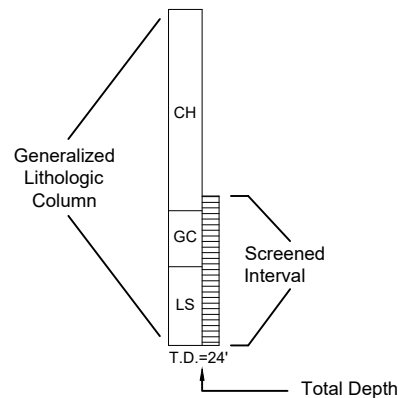
Figure 5  
 ASH POND AREA  
 GEOLOGIC CROSS SECTION A-A'  
 WEST SIDE OF WEST ASH POND  
 THROUGH PROCESS WATER POND

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV  
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 Texas Registrations: Engineering F-8542, Geoscience 50127

Plot Date: 11/05/25 - 1:17pm, Plotted by: thigh  
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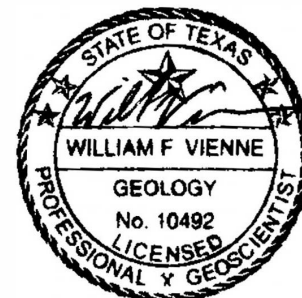
MONITORING WELL CONSTRUCTION



- ▼ Max. Observed Historical Water Level (Ft MSL)  
▲ Min. Observed Historical Water Level (Ft MSL)

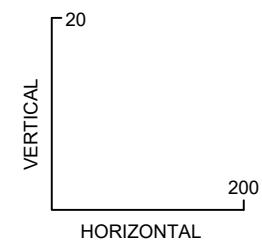
EXPLANATION

- SAND  
■ CLAY  
■ SILT



11/25/2025

SCALE IN FEET



10x Vertical Exaggeration

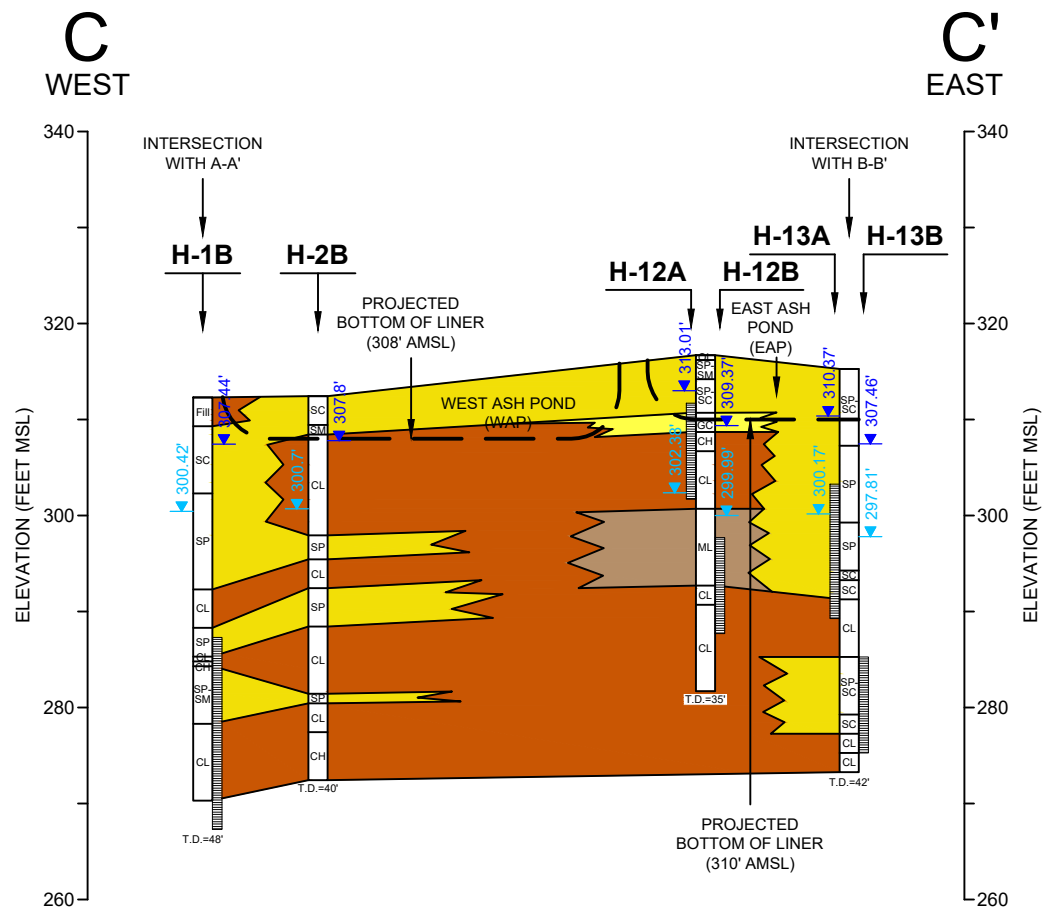
**MARTIN LAKE STEAM ELECTRIC STATION**  
TATUM, TEXAS

Figure 6  
**ASH POND AREA**  
**GEOLOGIC CROSS SECTION B-B'**  
**EAST SIDE OF ASH POND**  
**THROUGH SCRUBBER POND**

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

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Texas Registrations: Engineering F-8542, Geoscience 50127

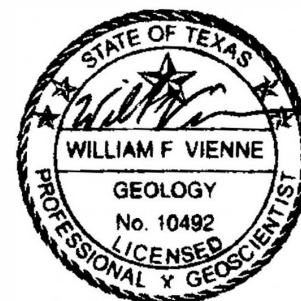
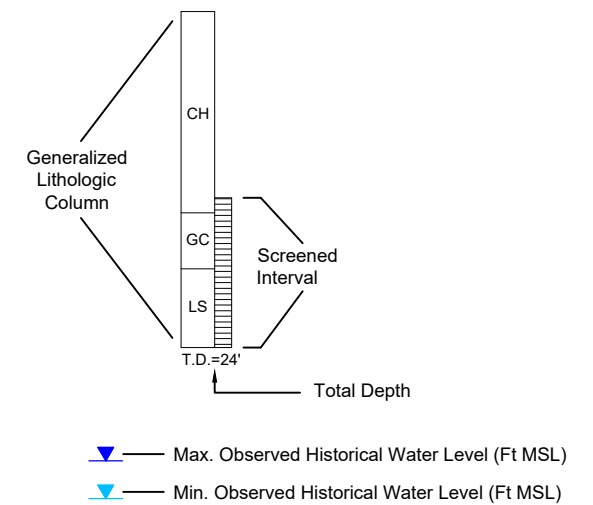
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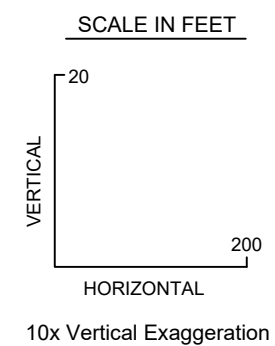
### EXPLANATION

- SAND
- CLAY
- SILT
- GRAVELY SAND

### MONITORING WELL CONSTRUCTION



11/25/2025



### MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

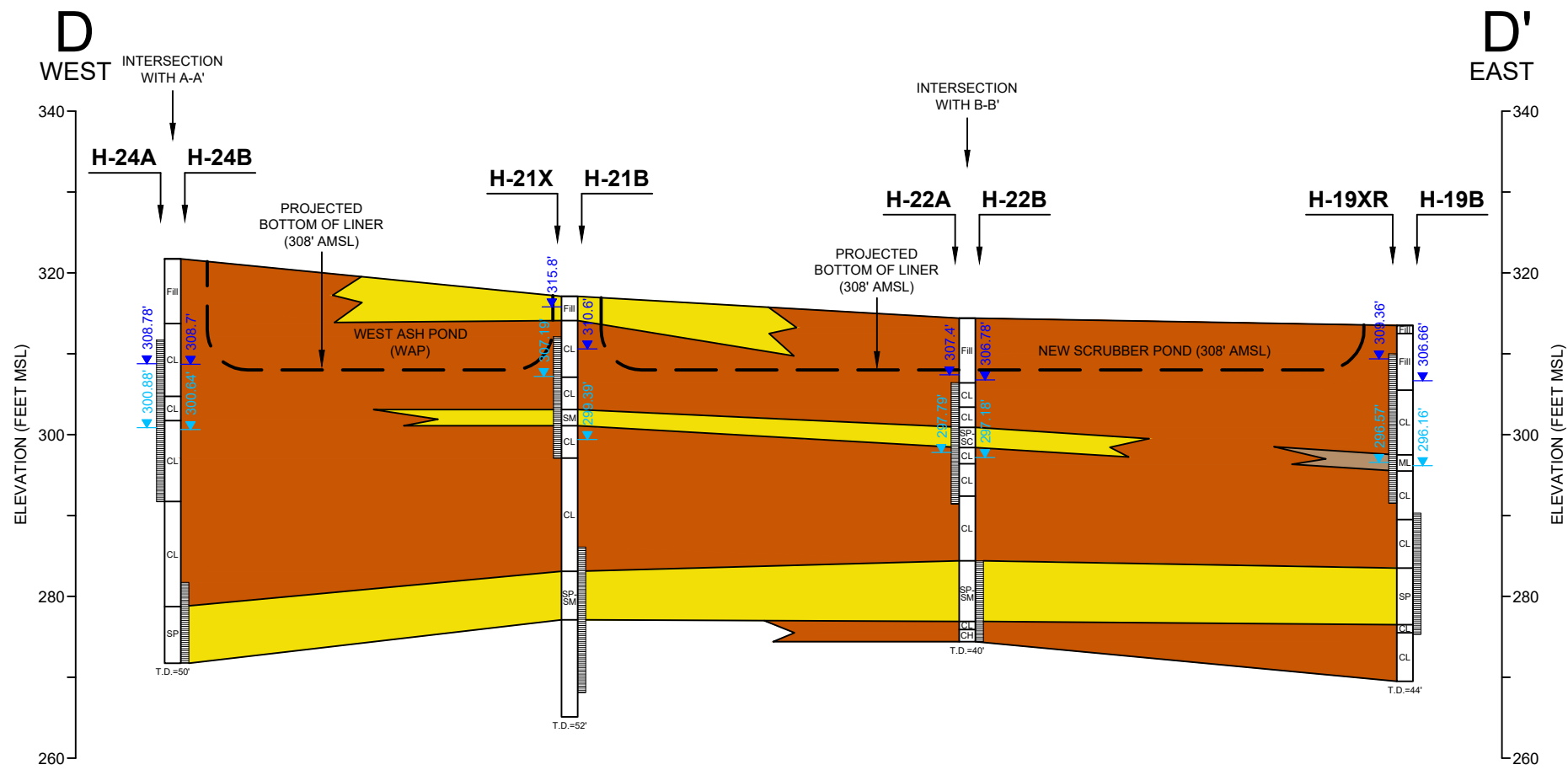
Figure 7  
ASH POND AREA  
GEOLOGIC CROSS SECTION C-C'  
NORTH SIDE OF WEST ASH POND  
AND EAST ASH POND

PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

Bullock, Bennett & Associates, LLC  
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Texas Registrations: Engineering F-8542, Geoscience 50127



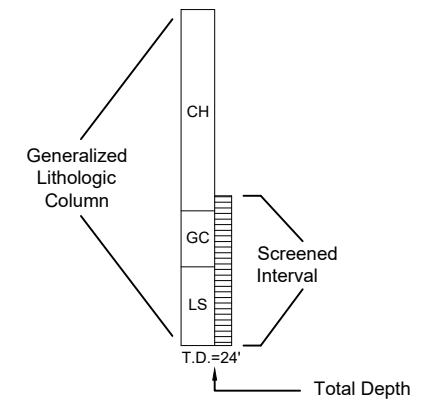
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### EXPLANATION

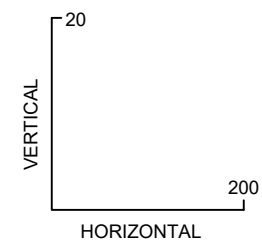
- SAND
- CLAY
- SILT

### MONITORING WELL CONSTRUCTION

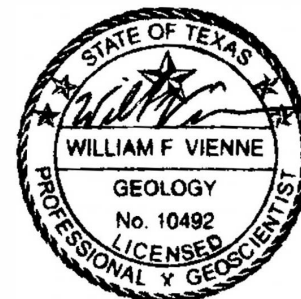


- Max. Observed Historical Water Level (Ft MSL)
- Min. Observed Historical Water Level (Ft MSL)

### SCALE IN FEET



10x Vertical Exaggeration



11/25/2025

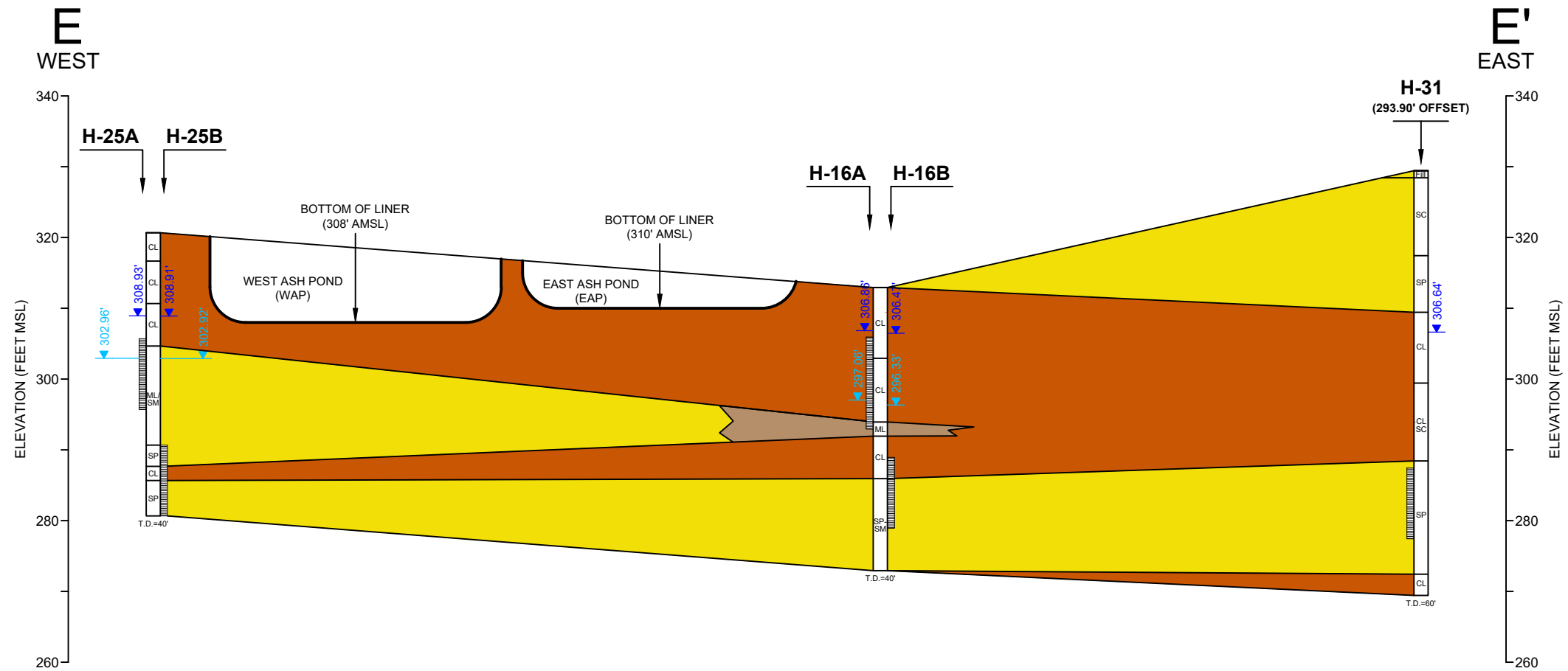
### MARTIN LAKE STEAM ELECTRIC STATION TATUM, TEXAS

Figure 8  
ASH POND AREA  
GEOLOGIC CROSS SECTION D-D'  
SOUTH SIDE OF WEST ASH POND  
AND SCRUBBER POND

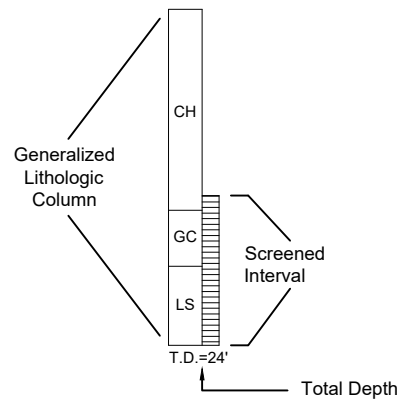
PROJECT: 23643V-32 BY: HLS DATE: NOV. 2025 CHECKED: WV

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Texas Registrations: Engineering F-8542, Geoscience 50127

Plot Date: 11/05/25 - 1:18pm, Plotted by: thigh  
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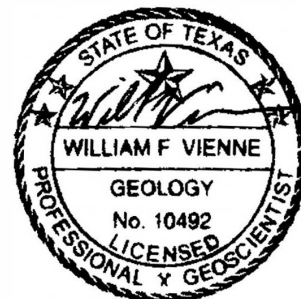
**MONITORING WELL CONSTRUCTION**



▼ — Max. Observed Historical Water Level (Ft MSL)  
▲ — Min. Observed Historical Water Level (Ft MSL)

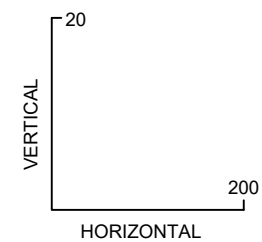
**EXPLANATION**

- SAND
- CLAY
- SILT



11/25/2025

**SCALE IN FEET**



**MARTIN LAKE STEAM ELECTRIC STATION**  
**TATUM, TEXAS**

Figure 9  
**ASH POND AREA**  
**GEOLOGIC CROSS SECTION E-E'**  
**THROUGH WEST ASH POND**  
**AND EAST ASH POND**

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Engineering and Geoscience  
Texas Registrations: Engineering F-8542, Geoscience 50127

## **APPENDIX H – FINANCIAL ASSURANCE**

### **Post-Closure Care Cost Estimate**



Bullock, Bennett & Associates, LLC \* 165 N. Lampasas Street \* Bertram, Texas 78605  
Telephone: 512.355.9198 \* Fax: 512.355.9197

**DATE:** November 25, 2025

**TO:** Mr. Eric Chavers, Luminant

**FROM:** Dan Bullock, PE / Will Vienne, PG

## **TECHNICAL MEMORANDUM**

BBA Project No. 23643V

### **MARTIN LAKE POWER PLANT PDP-5, ASH PONDS AND A1 AREA LANDFILL POST CLOSURE CARE COST ESTIMATES - REVISION 3**

---

Luminant Generation Company, LLC (Luminant) owns and operates the Martin Lake Steam Electric Station (MLSES) located approximately five miles southwest of Tatum in Rusk County, Texas. Coal Combustion Residuals (CCR) including fly ash, bottom ash, and gypsum are generated as part of MLSES unit operation and managed in Permanent Disposal Pond No. 5 (PDP-5), the Bottom Ash Ponds and New Scrubber Pond (referred to collectively as the Ash Ponds) and in the A1 Area Landfill (A1 LF).

These CCR Units are regulated under 40 CFR 257, Subpart D (the "Federal CCR Rule") and 30 Texas Administrative Code (TAC) Chapter 352 (The "TCEQ CCR Rule"). In accordance with 30 TAC §352.201, Luminant is required to submit an application to TCEQ to obtain a registration for each of these CCR Units. Bullock, Bennett & Associates, LLC (BBA) was retained by Luminant to assist with preparation of Post Closure Care Cost Estimates (PCCEs) for PDP-5, the Ash Ponds and the A1 LF in accordance with §352.1101. This technical memorandum presents the PCCEs estimated by BBA for these units. The PCCEs were prepared using TCEQ Technical Guidance Documents TG-30 and TG-31 and related documents.

#### **1.0 CCR Unit Closure Assumptions**

The PCCEs were prepared based on the following closure assumptions for the MLSES CCR Units:

- PDP-5:
  - CCR Unit Closure:
    - Closure in Place with low permeability cap
    - Cap Area: 40 acres
  - Groundwater Closure:
    - No evidence of a release to groundwater to date
    - Continuation of Detection Monitoring for Groundwater
    - Nine (9) monitoring wells sampled semi-annually
  - Existing Leachate Collection System operated throughout post closure care period
- Ash Ponds:
  - West Ash Pond (WAP), East Ash Pond (EAP) and New Scrubber Pond (NSP) managed as one CCR Unit
  - CCR Unit Closure:
    - Closure in Place with low permeability cap
    - Cap Areas:
      - WAP and EAP Cap Area: 25 acres



- NSP Cap Area: 13 acres
  - Total: 38 acres
- Groundwater Closure:
  - Monitored Natural Attenuation (MNA) with MNA Groundwater Monitoring
  - Continuation of Detection and Assessment Monitoring for Groundwater
  - Seven (7) monitoring wells sampled semi-annually
- A-1 Area Landfill:
  - CCR Unit Closure:
    - Closure in Place with low permeability cap
    - Cap Areas:
      - Existing Cap Area: 464 acres
      - Future Cap Area: 321 acres
      - Total: 785 acres
  - Groundwater Closure:
    - Monitored Natural Attenuation (MNA) with MNA Groundwater Monitoring
    - Continuation of Detection and Assessment Monitoring for Groundwater
    - Twelve (12) monitoring wells sampled semi-annually

## **2.0 Post Closure Care Cost Assumptions**

The following general assumptions were incorporated into the PCCEs:

- Post Closure Care Period. A post-closure care period of 30 years is assumed in accordance with 30 TAC §352.1241 and 40 CFR § 257.104(c).
- CCR Unit Inspections. Weekly and annual inspections of the CCR Units are required under §352.831 and §352.841. It is assumed that these inspections will continue throughout the Post Closure Care Period.
- Final Cover Maintenance. It is likely that some level of maintenance/repair will be required for the final cover systems used to close the CCR Units. The PCCEs include the following assumptions for final cover maintenance/repair:
  - Years 1-5 After Closure - it is assumed that erosion damage on 5% of the cap soil will be repaired each year. The thickness of each repair is assumed to average 6 inches of soil. In addition, the repaired areas will be revegetated.
  - Years 6-30 After Closure - it is assumed that erosion damage on 5% of the cap soil will be repaired three times during this period. The thickness of each repair is assumed to average 6 inches of soil. In addition, the repaired areas will be revegetated.
  - Estimated engineering/mobilization costs associated with the repairs/revegetation are included in the PCCEs.
  - Annual mowing costs for the final cover are included in the PCCEs.
- General Site Maintenance. Maintenance of run-off/drainage structures, access roads, fencing, signs, etc. are included in the PCCEs.
- Groundwater Monitoring. Semi-annual groundwater monitoring in accordance with the Federal/TCEQ CCR Rules (detection monitoring or assessment monitoring) is on-going for the units. It is assumed that the current groundwater monitoring program will continue throughout the Post Closure Care Period. It is

also likely that maintenance of the monitoring well system at the units will be required during the post closure care period. The PCCEs assume that one monitoring well will be replaced every 10 years at each CCR Unit.

In addition, the Ash Ponds and A1 LF incorporate MNA as a groundwater remedy as part of closure. For those CCR Units, it is assumed that MNA analyses will be included in the semi-annual groundwater monitoring events.

- One Time Post Closure Care Costs. The following one time activities associated with post closure care are included in the PCCEs:
  - Deed Notices/Surveys
  - Monitoring Well Plugging and Abandonment
- Leachate Collection – PDP-5. Martin Lake PDP-5 is constructed with a leachate collection system to remove leachate from the unit after closure. For the PDP-5 PCCE, it is assumed that all free liquids in PDP-5 will be removed during closure and the existing leachate collection system will be operated throughout the post closure care period to remove water that infiltrates through the low permeability cap. For the PCCE, the average annual volume of leachate generated following closure was estimated to be approximately 1,000 gallons per year using the Hydrologic Evaluation of Landfill Performance (HELP) Model (see Attachment A). Costs to dispose of this estimated volume of leachate as Class II Industrial Waste and maintain the leachate collection system through the post closure care period are included in the PCCE for PDP-5.
- Contingency. A 10% contingency factor is included in the PCCEs.
- All unit costs are in 2021 dollars. Cost increase from Year 2021 to Year 2025 is based on Consumer Price Index percentage increase of 20% over that period.

### 3.0 Post Closure Care Cost Estimate

Based on the assumptions listed above, the 30-Year post closure care cost estimates (in Year 2025 dollars) for the MLSES CCR Units are as follows (see Tables 1, 2 and 3 for details):

- PDP-5: \$2,432,144
- Ash Ponds: \$2,469,857
- A1 LF: \$9,927,675

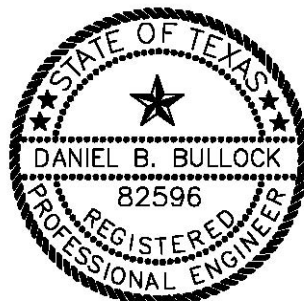
It should be noted that the PCCEs presented herein are considered Opinions of Probable Cost and represent BBA's best judgement based on the assumptions stated, information available at the time the estimates were prepared, and BBA's experience with similar sites. The PCCEs are susceptible to variations in future cost of materials, labor, and equipment and should not be considered guaranteed maximum prices for post closure care activities.

Please do not hesitate to contact us if you have any questions or comments.



Dan B. Bullock, P.E.  
Principal Engineer (TX PE 82596)

Bullock, Bennett & Associates, LLC



11/25/2025



Will Vienne, P.G.  
Senior Consultant (TX PG 10492)

Bullock, Bennett & Associates, LLC

## TABLES

Table 1

**Martin Lake Steam Electric Station - PDP-5  
Post Closure Care Cost Estimate - 30 TAC 352.1101**

| <b>Item</b>                                                              | <b>Unit</b> | <b>Rate</b> | <b>Quantity</b> | <b>Cost/Event</b> | <b>No. of Events</b> | <b>30-Year Cost</b> |
|--------------------------------------------------------------------------|-------------|-------------|-----------------|-------------------|----------------------|---------------------|
| <u>CCR Unit Inspections (Annually)</u>                                   | LS          | \$15,000    | 1               | \$15,000          | 30                   | \$450,000           |
| <u>Final Cover Maintenance</u>                                           |             |             |                 |                   |                      |                     |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap per year, Years 1-5   | CY          | \$5         | 1,613           | \$8,067           | 5                    | \$40,333            |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap, 3 times, Years 6-30  | CY          | \$5         | 1,613           | \$8,067           | 3                    | \$24,200            |
| - Revegetation, 5% of cap area per year, Years 1-5                       | AC          | \$1,500     | 2.0             | \$3,000           | 5                    | \$15,000            |
| - Revegetation, 5% of cap area, 3 times, Years 6-30                      | AC          | \$1,500     | 2.0             | \$3,000           | 3                    | \$9,000             |
| - Engineering/Mobilization for Final Cover Repairs/Revegetation Events   | LS          | \$5,000     | 1               | \$5,000           | 8                    | \$40,000            |
| - Mowing, per year                                                       | AC          | \$150       | 40              | \$6,000           | 30                   | \$180,000           |
| <u>General Site Maintenance (Annually)</u>                               |             |             |                 |                   |                      |                     |
| - Run-off/Drainage Structures                                            | LS          | \$2,000     | 1               | \$2,000           | 30                   | \$60,000            |
| - Access Roads, fencing, signs, etc.                                     | LS          | \$1,000     | 1               | \$1,000           | 30                   | \$30,000            |
| <u>Leachate Management (Annually)</u>                                    |             |             |                 |                   |                      |                     |
| - Leachate Disposal (Class II)                                           | Gal         | \$10        | 1,000           | \$10,000          | 30                   | \$300,000           |
| - Leachate System Maintenance                                            | LS          | \$2,000     | 1               | \$2,000           | 30                   | \$60,000            |
| <u>GW Monitoring (Annually)</u>                                          |             |             |                 |                   |                      |                     |
| - Detection Monitoring - Semi-annual Collection/Analysis, (9 MWs, 1 Dup) | EA          | \$500       | 10              | \$5,000           | 60                   | \$300,000           |
| - Annual Report                                                          | LS          | \$10,000    | 1               | \$10,000          | 30                   | \$300,000           |
| - Monitoring Well Maintenance (1 MW replaced every 10 years)             | EA          | \$5,000     | 1               | \$5,000           | 3                    | \$15,000            |
| <u>One Time Post Closure Care Costs</u>                                  |             |             |                 |                   |                      |                     |
| - Deed Notices/Surveys                                                   | LS          | \$10,000    | 1               | \$10,000          | 1                    | \$10,000            |
| - Monitoring Well Plugging and Abandonment                               | EA          | \$1,000     | 9               | \$9,000           | 1                    | \$9,000             |
| <b>Subtotal 30-Year Post Closure Care Costs:</b>                         |             |             |                 |                   |                      | <b>\$1,842,533</b>  |
| <b>Contingency (10%):</b>                                                |             |             |                 |                   |                      | <b>\$184,253</b>    |
| <b>Year 2021 30-Year Post Closure Cost Estimate:</b>                     |             |             |                 |                   |                      | <b>\$2,026,787</b>  |
| <b>Year 2025 CPI-Adjusted 30-Year Post Closure Cost Estimate:</b>        |             |             |                 |                   |                      | <b>\$2,432,144</b>  |

**Notes:**

1. LF - linear foot
2. SY - square yard
3. CY - cubic yard
4. EA - each
5. AC - acre
6. M - month
7. Gal - gallons
8. See Technical Memorandum for cost assumptions
9. Unit costs shown are based on 2021 dollars. Cost increase from Year 2021 to Year 2025 is based on Consumer Price Index percentage increase of approximately 20% over that period.



Table 2

**Martin Lake Steam Electric Station - Ash Ponds  
Post Closure Care Cost Estimate - 30 TAC 352.1101**

| Item                                                                     | Unit | Rate     | Quantity | Cost/Event | No. of Events | 30-Year Cost       |
|--------------------------------------------------------------------------|------|----------|----------|------------|---------------|--------------------|
| <u>CCR Unit Inspections (Annually)</u>                                   | LS   | \$15,000 | 1        | \$15,000   | 30            | \$450,000          |
| <u>Final Cover Maintenance</u>                                           |      |          |          |            |               |                    |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap per year, Years 1-5   | CY   | \$5      | 1,533    | \$7,663    | 5             | \$38,315           |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap, 3 times, Years 6-30  | CY   | \$5      | 1,533    | \$7,663    | 3             | \$22,989           |
| - Revegetation, 5% of cap area per year, Years 1-5                       | AC   | \$1,500  | 1.9      | \$2,850    | 5             | \$14,250           |
| - Revegetation, 5% of cap area, 3 times, Years 6-30                      | AC   | \$1,500  | 1.9      | \$2,850    | 3             | \$8,550            |
| - Engineering/Mobilization for Final Cover Repairs/Revegetation Events   | LS   | \$5,000  | 1        | \$5,000    | 8             | \$40,000           |
| - Mowing, per year                                                       | AC   | \$150    | 38       | \$5700     | 30            | \$171,000          |
| <u>General Site Maintenance (Annually)</u>                               |      |          |          |            |               |                    |
| - Run-off/Drainage Structures                                            | LS   | \$3,000  | 1        | \$3,000    | 30            | \$90,000           |
| - Access Roads, fencing, signs, etc.                                     | LS   | \$1,500  | 1        | \$1,500    | 30            | \$45,000           |
| <u>GW Monitoring (Annually)</u>                                          |      |          |          |            |               |                    |
| - Detection Monitoring - Semi-annual Collection/Analysis, (7 MWs, 1 Dup) | EA   | \$500    | 8        | \$4,000    | 60            | \$240,000          |
| - Assessment Monitoring - Semi-annual Analysis, (7 MWs, 1 Dup)           | EA   | \$350    | 8        | \$2,800    | 60            | \$168,000          |
| - MNA Monitoring - Semi-annual Analysis, (7 MWs, 1 Dup)                  | EA   | \$200    | 8        | \$1,600    | 60            | \$96,000           |
| - Annual Report (Including MNA)                                          | LS   | \$15,000 | 1        | \$15,000   | 30            | \$450,000          |
| - Monitoring Well Maintenance (1 MW replaced every 10 years)             | EA   | \$5,000  | 1        | \$5,000    | 3             | \$15,000           |
| <u>One Time Post Closure Care Costs</u>                                  |      |          |          |            |               |                    |
| - Deed Notices/Surveys                                                   | LS   | \$15,000 | 1        | \$15,000   | 1             | \$15,000           |
| - Monitoring Well Plugging and Abandonment                               | EA   | \$1,000  | 7        | \$7,000    | 1             | \$7,000            |
| Subtotal 30-Year Post Closure Care Costs:                                |      |          |          |            |               | \$1,871,104        |
| Contingency (10%):                                                       |      |          |          |            |               | \$187,110          |
| <b>Year 2021 30-Year Post Closure Cost Estimate:</b>                     |      |          |          |            |               | <b>\$2,058,214</b> |
| <b>Year 2025 CPI-Adjusted 30-Year Post Closure Cost Estimate:</b>        |      |          |          |            |               | <b>\$2,469,857</b> |

**Notes:**

1. LF - linear foot
2. SY - square yard
3. CY - cubic yard
4. EA - each
5. AC - acre
6. M - month
7. Gal - gallons
8. See Technical Memorandum for cost assumptions
9. Unit costs shown are based on 2021 dollars. Cost increase from Year 2021 to Year 2025 is based on Consumer Price Index percentage increase of approximately 20% over that period.

Table 3

**Martin Lake Steam Electric Station - A1 Area Landfill  
Post Closure Care Cost Estimate - 30 TAC 352.1101**

| Item                                                                      | Unit | Rate     | Quantity | Cost/Event | No. of Events | 30-Year Cost       |
|---------------------------------------------------------------------------|------|----------|----------|------------|---------------|--------------------|
| <u>CCR Unit Inspections (Annually)</u>                                    | LS   | \$15,000 | 1        | \$15,000   | 30            | \$450,000          |
| <u>Final Cover Maintenance</u>                                            |      |          |          |            |               |                    |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap per year, Years 1-5    | CY   | \$5      | 31,662   | \$158,308  | 5             | \$791,542          |
| - Erosion Repair, 6-inch avg. thickness, 5% of cap, 3 times, Years 6-30   | CY   | \$5      | 31,662   | \$158,308  | 3             | \$474,925          |
| - Revegetation, 5% of cap area per year, Years 1-5                        | AC   | \$1,500  | 39.3     | \$58,875   | 5             | \$294,375          |
| - Revegetation, 5% of cap area, 3 times, Years 6-30                       | AC   | \$1,500  | 39.3     | \$58,875   | 3             | \$176,625          |
| - Engineering/Mobilization for Final Cover Repairs/Revegetation Events    | LS   | \$15,000 | 1        | \$15,000   | 8             | \$120,000          |
| - Mowing, per year                                                        | AC   | \$150    | 785      | \$117,750  | 30            | \$3,532,500        |
| <u>General Site Maintenance (Annually)</u>                                |      |          |          |            |               |                    |
| - Run-off/Drainage Structures                                             | LS   | \$8,000  | 1        | \$8,000    | 30            | \$240,000          |
| - Access Roads, fencing, signs, etc.                                      | LS   | \$4,000  | 1        | \$4,000    | 30            | \$120,000          |
| <u>GW Monitoring (Annually)</u>                                           |      |          |          |            |               |                    |
| - Detection Monitoring - Semi-annual Collection/Analysis, (12 MWs, 1 Dup) | EA   | \$500    | 13       | \$6,500    | 60            | \$390,000          |
| - Assessment Monitoring - Semi-annual Analysis, (12 MWs, 1 Dup)           | EA   | \$350    | 13       | \$4,550    | 60            | \$273,000          |
| - MNA Monitoring - Semi-annual Analysis, (12 MWs, 1 Dup)                  | EA   | \$200    | 13       | \$2,600    | 60            | \$156,000          |
| - Annual Report (Including MNA)                                           | LS   | \$15,000 | 1        | \$15,000   | 30            | \$450,000          |
| - Monitoring Well Maintenance (1 MW replaced every 10 years)              | EA   | \$5,000  | 1        | \$5,000    | 3             | \$15,000           |
| <u>One Time Post Closure Care Costs</u>                                   |      |          |          |            |               |                    |
| - Deed Notices/Surveys                                                    | LS   | \$25,000 | 1        | \$25,000   | 1             | \$25,000           |
| - Monitoring Well Plugging and Abandonment                                | EA   | \$1,000  | 12       | \$12,000   | 1             | \$12,000           |
| Subtotal 30-Year Post Closure Care Costs:                                 |      |          |          |            |               | \$7,520,967        |
| Contingency (10%):                                                        |      |          |          |            |               | \$752,097          |
| <b>Year 2021 30-Year Post Closure Cost Estimate:</b>                      |      |          |          |            |               | <b>\$8,273,063</b> |
| <b>Year 2025 CPI-Adjusted 30-Year Post Closure Cost Estimate:</b>         |      |          |          |            |               | <b>\$9,927,675</b> |

**Notes:**

1. LF - linear foot
2. SY - square yard
3. CY - cubic yard
4. EA - each
5. AC - acre
6. M - month
7. Gal - gallons
8. See Technical Memorandum for cost assumptions
9. Unit costs shown are based on 2021 dollars. Cost increase from Year 2021 to Year 2025 is based on Consumer Price Index percentage increase of approximately 20% over that period.

**ATTACHMENT A**  
**PDP-5 HELP MODEL RESULTS**

-----  
**HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE**  
**HELP MODEL VERSION 4.0 BETA (2018)**  
**DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY**  
-----

**Title:** Martin Lake PDP 5 **Simulated On:** 1/3/2022 14:52  
-----

**Layer 1**

Type 1 - Vertical Percolation Layer (Cover Soil)

SiL - Silty Loam(Moderate)

Material Texture Number 23

|                                  |   |                 |
|----------------------------------|---|-----------------|
| Thickness                        | = | 18 inches       |
| Porosity                         | = | 0.461 vol/vol   |
| Field Capacity                   | = | 0.36 vol/vol    |
| Wilting Point                    | = | 0.203 vol/vol   |
| Initial Soil Water Content       | = | 0.2798 vol/vol  |
| Effective Sat. Hyd. Conductivity | = | 9.00E-06 cm/sec |

**Layer 2**

Type 4 - Flexible Membrane Liner

LDPE Membrane

Material Texture Number 36

|                                  |   |                 |
|----------------------------------|---|-----------------|
| Thickness                        | = | 0.04 inches     |
| Effective Sat. Hyd. Conductivity | = | 4.00E-13 cm/sec |
| FML Pinhole Density              | = | 1 Holes/Acre    |
| FML Installation Defects         | = | 4 Holes/Acre    |
| FML Placement Quality            | = | 2 Excellent     |

**Layer 3**

Type 1 - Vertical Percolation Layer

Clay

Material Texture Number 43

|                                  |   |                 |
|----------------------------------|---|-----------------|
| Thickness                        | = | 24 inches       |
| Porosity                         | = | 0.451 vol/vol   |
| Field Capacity                   | = | 0.419 vol/vol   |
| Wilting Point                    | = | 0.332 vol/vol   |
| Initial Soil Water Content       | = | 0.4174 vol/vol  |
| Effective Sat. Hyd. Conductivity | = | 1.00E-07 cm/sec |

**Layer 4**

Type 1 - Vertical Percolation Layer (Waste)

High-Density Electric Plant Coal Fly Ash

Material Texture Number 30



|                                  |   |                 |
|----------------------------------|---|-----------------|
| Thickness                        | = | 720 inches      |
| Porosity                         | = | 0.541 vol/vol   |
| Field Capacity                   | = | 0.187 vol/vol   |
| Wilting Point                    | = | 0.047 vol/vol   |
| Initial Soil Water Content       | = | 0.187 vol/vol   |
| Effective Sat. Hyd. Conductivity | = | 5.00E-05 cm/sec |

#### Layer 5

Type 3 - Barrier Soil Liner

C (Moderate)

Material Texture Number 29

|                                  |   |                 |
|----------------------------------|---|-----------------|
| Thickness                        | = | 48 inches       |
| Porosity                         | = | 0.451 vol/vol   |
| Field Capacity                   | = | 0.419 vol/vol   |
| Wilting Point                    | = | 0.332 vol/vol   |
| Initial Soil Water Content       | = | 0.451 vol/vol   |
| Effective Sat. Hyd. Conductivity | = | 6.80E-07 cm/sec |

-----  
Note: Initial moisture content of the layers and snow water were  
computed as nearly steady-state values by HELP.

#### General Design and Evaporative Zone Data

|                                      |   |                |
|--------------------------------------|---|----------------|
| SCS Runoff Curve Number              | = | 84.2           |
| Fraction of Area Allowing Runoff     | = | 100 %          |
| Area projected on a horizontal plane | = | 40 acres       |
| Evaporative Zone Depth               | = | 18 inches      |
| Initial Water in Evaporative Zone    | = | 5.037 inches   |
| Upper Limit of Evaporative Storage   | = | 8.298 inches   |
| Lower Limit of Evaporative Storage   | = | 3.654 inches   |
| Initial Snow Water                   | = | 0 inches       |
| Initial Water in Layer Materials     | = | 171.343 inches |
| Total Initial Water                  | = | 171.343 inches |
| Total Subsurface Inflow              | = | 0 inches/year  |

-----  
Note: SCS Runoff Curve Number was calculated by HELP.

#### Evapotranspiration and Weather Data

|                                       |   |               |
|---------------------------------------|---|---------------|
| Station Latitude                      | = | 32.31 Degrees |
| Maximum Leaf Area Index               | = | 5             |
| Start of Growing Season (Julian Date) | = | 0 days        |
| End of Growing Season (Julian Date)   | = | 367 days      |
| Average Wind Speed                    | = | 6 mph         |

|                                       |   |      |
|---------------------------------------|---|------|
| Average 1st Quarter Relative Humidity | = | 1 %  |
| Average 2nd Quarter Relative Humidity | = | 22 % |
| Average 3rd Quarter Relative Humidity | = | 88 % |
| Average 4th Quarter Relative Humidity | = | 22 % |

-----

Note: Evapotranspiration data was obtained for Dirgin, Texas

#### **Normal Mean Monthly Precipitation (inches)**

| <u>Jan/Jul</u> | <u>Feb/Aug</u> | <u>Mar/Sep</u> | <u>Apr/Oct</u> | <u>May/Nov</u> | <u>Jun/Dec</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 3.940712       | 3.384053       | 4.449471       | 3.632658       | 4.152557       | 5.603921       |
| 3.172363       | 2.83961        | 2.855806       | 4.403743       | 4.552789       | 4.108209       |

-----

Note: Precipitation was simulated based on HELP V4 weather simulation for:  
Lat/Long: 32.31/-94.55

#### **Normal Mean Monthly Temperature (Degrees Fahrenheit)**

| <u>Jan/Jul</u> | <u>Feb/Aug</u> | <u>Mar/Sep</u> | <u>Apr/Oct</u> | <u>May/Nov</u> | <u>Jun/Dec</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 51.6           | 52.5           | 64.1           | 73             | 79.7           | 89.4           |
| 92.3           | 89.7           | 84.1           | 74             | 66.1           | 57.1           |

-----

Note: Temperature was simulated based on HELP V4 weather simulation for:  
Lat/Long: 32.31/-94.55  
Solar radiation was simulated based on HELP V4 weather simulation for:  
Lat/Long: 32.31/-94.55

## Average Annual Totals Summary

**Title:** Martin Lake PDP 5

**Simulated on:** 1/6/2022 8:32

|                                     | Average Annual Totals for Years 1 - 30* |            |              |              |           |
|-------------------------------------|-----------------------------------------|------------|--------------|--------------|-----------|
|                                     | (inches)                                | [std dev]  | (cubic feet) | (gallons)    | (percent) |
| Precipitation                       | 47.10                                   | [5.76]     | 6,838,323.4  | 51,154,215.3 | 100.00    |
| Runoff                              | 4.062                                   | [2.566]    | 589,755.5    | 4,411,677.7  | 8.62      |
| Evapotranspiration                  | 42.959                                  | [5.448]    | 6,237,618.8  | 46,660,632.2 | 91.22     |
| Subprofile1                         |                                         |            |              |              |           |
| Percolation/leakage through Layer 2 | 0.000690                                | [0.000293] | 100.1        | 749.1        | 0.00      |
| Average Head on Top of Layer 2      | 2.5255                                  | [1.058]    | ---          | ---          | ---       |
| Subprofile2                         |                                         |            |              |              |           |
| Percolation/leakage through Layer 5 | 0.000690                                | [0.000293] | 100.1        | 749.1        | 0.00      |
| Average Head on Top of Layer 5      | 0.0000                                  | [0]        | ---          | ---          | ---       |
| Water storage                       |                                         |            |              |              |           |
| Change in water storage             | 0.0747                                  | [1.8339]   | 10,849.0     | 81,156.3     | 0.16      |

\* Note: Average inches are converted to volume based on the user-specified area.

# Peak Annual Totals Summary

| Year | Percolation/leakage<br>through Layer 2<br>(cubic feet) | Percolation/leaka<br>ge through Layer<br>2 (gallons) |
|------|--------------------------------------------------------|------------------------------------------------------|
| 1    | 94.36                                                  | 705.86                                               |
| 2    | 90.86                                                  | 679.71                                               |
| 3    | 114.98                                                 | 860.12                                               |
| 4    | 133.94                                                 | 1001.98                                              |
| 5    | 68.53                                                  | 512.66                                               |
| 6    | 72.73                                                  | 544.05                                               |
| 7    | 65.14                                                  | 487.29                                               |
| 8    | 129.67                                                 | 969.97                                               |
| 9    | 145.04                                                 | 1084.99                                              |
| 10   | 96.08                                                  | 718.70                                               |
| 11   | 113.33                                                 | 847.75                                               |
| 12   | 127.05                                                 | 950.38                                               |
| 13   | 170.85                                                 | 1278.05                                              |
| 14   | 110.62                                                 | 827.46                                               |
| 15   | 176.37                                                 | 1319.34                                              |
| 16   | 32.26                                                  | 241.34                                               |
| 17   | 135.53                                                 | 1013.81                                              |
| 18   | 114.29                                                 | 854.96                                               |
| 19   | 124.03                                                 | 927.84                                               |
| 20   | 9.75                                                   | 72.90                                                |
| 21   | 36.21                                                  | 270.86                                               |
| 22   | 65.90                                                  | 492.99                                               |
| 23   | 79.54                                                  | 594.98                                               |
| 24   | 31.83                                                  | 238.14                                               |
| 25   | 99.15                                                  | 741.70                                               |
| 26   | 78.99                                                  | 590.87                                               |
| 27   | 111.77                                                 | 836.07                                               |
| 28   | 180.88                                                 | 1353.09                                              |
| 29   | 76.11                                                  | 569.33                                               |
| 30   | 118.42                                                 | 885.85                                               |



## **APPENDIX H – FINANCIAL ASSURANCE**

### **Post-Closure Care Cost Estimate**

**ATTACHMENT 9**

**NOD 3 Response Letter Replacement Pages**

Table 1 - NOD Summary and Response  
Registration No. CCR105 - Luminant Generation Company LLC  
Application Deficiencies - NOD 3

| ID | App. Section | App. Sub Section | Location[2]                                                      | Citation                                   | Deficiency Description/Resolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Response                                                                                                                                                                                                                                                                                                                  |
|----|--------------|------------------|------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | V            | V.26.A.2         | [Closure Plan, Bottom Ash Ponds and NSP, Figure 3]               | <a href="#">40 CFR §257.73(c)(1)(vii)</a>  | Revise Figure 3 to specify what existing contours represent (e.g., top of 4-in concrete revetment, geomembrane, protective cover, etc.). In addition, revise Figure 3 to ensure that elevations associated with bottom liner system for West Ash Pond (WAP), East Ash Pond (EAP), and the New Scrubber Pond (NSP) are consistent with other application drawings. Update Figure 3 with the signature, date, and seal of a Texas Licensed P.E.                                                                 | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 1 in Section 2.0. Closure Plan Addendum No. 2 referenced in the response memorandum is located in Appendix G of the application.                                                        |
| 2  | V            | V.26.A.2         | [App G]                                                          | 30 TAC §352.4 and 40 CFR §257.105(f)(9)    | Revise the following Figure 4 drawings with the signature, seal, and date of a Texas Licensed P.E, and include a statement that final elevations will be provided during closure of all CCR units: <ul style="list-style-type: none"> <li>Proposed Grading Plan, Closure Plan, Ash Pond Area</li> <li>Proposed Final Cover Grading Plan, Post Closure Plan, Ash Pond Area</li> <li>Proposed Grading Plan, Closure Plan, PDP-5</li> <li>Proposed Final Cover Grading Plan, Post Closure Plan, PDP-5</li> </ul> | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 2 in Section 2.0. Closure Plan Addendum No. 2 referenced in the response memorandum is located in Appendix G of the application.                                                        |
| 3  | V            | V.26.B           | [App E, Alternate Liner Demonstration Application, PDP-5]        | <a href="#">40 CFR §257.71(d)(2)(viii)</a> | Revise the application, as appropriate, in response to EPA's proposed decision to deny the alternate liner demonstration request for PDP-5 as noted in the EPA letter dated January 25, 2023.                                                                                                                                                                                                                                                                                                                 | Luminant submitted a request to withdraw the Alternate Liner Demonstration (ALD) on January 2, 2024. The application has been revised to reflect this update. A copy of this request is located in Appendix E. Also, see discussion of the ALD and withdrawal request under Item V.26.B. of the registration application. |
| 4  | VI           | VI.27.C          | [App F, GWM System Certification - Addendum No. 1, A-1 Landfill] | <a href="#">40 CFR §257.91(f)</a>          | Provide a P.E. Certification for BMW-33, which appears to have been added to the A1 Landfill Groundwater Monitoring (GWM) network as an upgradient well in 2019. Provide all applicable information to support the conclusion.                                                                                                                                                                                                                                                                                | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 4 in Section 2.0. The Groundwater Monitoring System Certification Addendum No. 2 for A1 Landfill referenced in the response memorandum is located in Appendix F of the application.     |

|   |    |                                                      |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         |
|---|----|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | VI | VI.28                                                | [App F, GWM Plan - Revision 2, Ash Pond Area, Section 5, pg. 19]                                                                                                                                                                                                                                  | <a href="#">40 CFR §257.93(c)</a>                                                                                                                                                                                                                                        | Revise to ensure that the rate and direction of groundwater (GW) flow will be determined each time GW is sampled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A statement indicating that the rate and direction of groundwater flow will be determined each time groundwater is sampled is provided in Section 2.2.3 of the Groundwater Monitoring Plan-Revision 2. Groundwater Monitoring Plan-Revision 2 is located in Appendix F. |
| 6 | VI | VI.28                                                | [App F, GWM Plan Revision 2, Ash Pond Area, Section 1.2.5, pg. 5]                                                                                                                                                                                                                                 | 30 TAC 352.951(b) <a href="#">and</a> 40 CFR 257.95(h)                                                                                                                                                                                                                   | Page 5 of the referenced GWM Plan states, "The GWPS shall be... for constituents for which an MCL has not been established, the background concentration for the constituent or approved regional screening level established in accordance with CCR Rule Section 257.91." 40 CFR 257.91 cites groundwater monitoring system requirements and does not address the GWPS. Revise the application to remove this reference and all language relating to the establishment of GWPS based on regional screening levels, as it is not one of the allowed ways to establish GWPS listed in 40 CFR 257.95(h) or 30 TAC 352.951(b). These rules only allow for the use of an MCL if it exists for that constituent, or the background concentration for that constituent.            | References to approved regional screening levels in the Groundwater Monitoring Plans for all CCR units have been removed. Groundwater Monitoring Plan-Revision 2 for all CCR units is located in Appendix F.                                                            |
| 7 | VI | VI.29.A<br><br>VI.29.C<br><br>VI.30.H<br><br>VIII.33 | [App F, 2021 GWM & Corrective Action Report Revision 1 - PDP-5]<br><br>[Table VI.C, CCR Units Under Detection Monitoring; Table VI.D, CCR Units Under Assessment Monitoring]<br>[Table VI.D-2: Groundwater Assessment Monitoring Parameter]<br>[Appendix H, Post Closure Cost Estimates, Table 1] | <a href="#">40 CFR §257.94(e)</a><br><br><a href="#">Application Instructions, &amp; 40 CFR 257.94(e) and</a><br><br><a href="#">30 TAC §352.231(b)</a><br><br><a href="#">40 CFR §257.93(h)(2) &amp; 40 CFR §257.94</a><br><br>40 CFR 257.94(e) and 30 TAC §352.1101(b) | Confirm PDP-5 is in the proper groundwater monitoring program (detection, assessment, or corrective action) and make appropriate adjustments to the application as necessary. If PDP-5 should be in assessment monitoring or corrective action, describe what actions have been taken or will be taken, along with any necessary revisions to the application, including updates to PDP-5 information and any post-closure cost estimates.<br><br>The 2021 GWM report for PDP-5 identified SSIs for boron in MW-23 and MW-25, calcium in MW-20A, MW-23, and MW-25, and chloride in MW-19. The report indicates that some of the SSIs were not valid because resampling did not confirm the referenced SSIs. Resampling for all referenced SSIs did not occur within 90-days. | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 7 in Section 2.0.                                                                                                                     |



|    |      |         |                                                                       |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                        |
|----|------|---------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  | VI   | VI.29.B | [App. F, GWM and Corrective Action]                                   | Application Instructions & <a href="#">40 CFR §257.93(d)</a>                                                    | Provide a Background Evaluation Report (BER) which discusses the establishment of background GW concentrations for the constituents listed in 40 CFR 257 Appendix III and IV. Submit a separate BER for each GWM network on-site. In addition, place the BER as a separate file on the facility's website.                                                                                                                   | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 8 in Section 2.0. The "Background Groundwater Monitoring and Statistical Analysis Summary Report" for the each CCR unit have been added to Appendix F. The reports are also referenced under item VI.29. and VI.30. of the registration application. |
| 9  | VI   | VI.29.C | [App F, 2021 GWM and CA Reports, A1-Landfill, Ash Pond Area, & PDP-5] | <a href="#">40 CFR §257.90(e)(5), (e)(6)(iii)(A), and (e)(6)(iv)(A)</a><br><a href="#">40 CFR §257.94(e)(2)</a> | Comment: Please ensure that future GWM reports include: all sampling performed during the year; any prescribed resampling data or ASDs; and a determination on whether any SSIs occurred.                                                                                                                                                                                                                                    | Future Groundwater Monitoring and Corrective Action Reports will include all sampling performed during the year, any prescribed resampling data or ASDs, and a determination on whether any SSIs occurred.                                                                                                                                                                             |
| 10 | VII  | VII.31  | [App. G, Closure Plan for A1 Area Landfill, Ash Pond Area, and PDP-5] | <a href="#">40 CFR §257.102(d)(1)(iii)</a>                                                                      | Revise the slope stability analysis for the final cover system associated with the A1 Area Landfill, Ash Pond Area, and PDP-5 to provide a statement indicating that an amendment will be submitted to include site specific geotechnical data, final cover materials testing data, and final design criteria prior to construction for review and approval. The analysis must be signed and sealed by a Texas Licensed P.E. | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 10 in Section 2.0.                                                                                                                                                                                                                                   |
| 11 | VII  | VII.31  | [App. G, Closure Plan for A1 Area Landfill]                           | <a href="#">40 CFR §257.102(d)(1)(iii)</a>                                                                      | Revise the slope stability analysis for the A1 Area Landfill to provide an evaluation for the interface between each component of the final cover system (e.g., vegetative soil layer/compacted mine spoil; compacted mine spoil/subgrade).                                                                                                                                                                                  | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 11 in Section 2.0.                                                                                                                                                                                                                                   |
| 12 | VII  | VII.31  | [App. G, Closure Plan for A1 Area Landfill, Ash Pond Area, and PDP-5] | 30 TAC §352.4; and 40 CFR §257.102(b) & (d)(3)(i)(D)                                                            | Revise the application to include a settlement analysis for the final cover system for each CCR unit. Provide a statement indicating that an amendment to include a settlement analysis with site specific geotechnical data, final cover materials testing data, and final design criteria will be submitted prior to construction for review and approval. The analysis must be signed and sealed by a Texas Licensed P.E. | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 12 in Section 2.0.                                                                                                                                                                                                                                   |
| 13 | VIII | VIII.33 | [Appendix H, Post Closure Cost Estimates, Table 2]                    | <a href="#">30 TAC §352.1101(b)</a>                                                                             | Revise the post-closure cost estimate for the NSP to ensure that the final cover area is consistent with the facility's closure plan. The post-closure cost estimate indicates that the final cover area for the NSP is 36 acres, while Table V.A, Surface Impoundment Characteristics and the 2016 Closure Plan, indicates the area is 13 acres.                                                                            | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 13 in Section 2.0.                                                                                                                                                                                                                                   |

|    |      |         |                                                        |                                     |                                                                                                                                                   |                                                                                                                                                      |
|----|------|---------|--------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14 | VIII | VIII.33 | [Appendix H, Post Closure Cost Estimates, Table 2 & 3] | <a href="#">30 TAC §352.1101(b)</a> | Revise the post-closure cost estimates in the referenced tables to include the dollar year in which the estimates were made (i.e., 2021 dollars). | Please see attached Technical Memorandum "Response to TCEQ NOD No. 3 - CCR Registration Application No. CCR105", Comment Item No. 14 in Section 2.0. |
|----|------|---------|--------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

<sup>[1]</sup> Deficiency ID – Key: Use this numbered ID to identify the NOD response.

<sup>2</sup> Location of deficiency in submittal/application. Items in square brackets [ ] refer to applicant's supplemental information submitted as attachments/appendices to the application form.

[\[1\] Deficiency ID – Key: Use this numbered ID to identify the NOD response.](#)

[\[2\] Location of deficiency in submittal/application. Items in square brackets \[ \] refer to applicant's supplemental information submitted as attachments/appendices to the application form.](#)



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February 26, 2024  
BBA Project No. 23643-01-2024

Mr. Eric Chavers  
Luminant Generation Company LLC  
6555 Sierra Drive.  
Irving, Texas 75309

**RE:        Response to TCEQ NOD No. 3  
             CCR Registration Application No. CCR105  
             Martin Lake Steam Electric Station - Rusk and Panola Counties, Texas  
             (TCEQ CCR Registration Application No. CCR105)**

Dear Mr. Chavers:

This letter report provides information to address Texas Commission on Environmental Quality (TCEQ) Notice of Deficiency (NOD) No. 3 on the Coal Combustion Residual (CCR) Registration Application for the Martin Lake Steam Electric Station (MLSES), which the TCEQ issued by email on December 22, 2023.

## **1.0     INTRODUCTION**

Luminant Generation Company LLC (Luminant) owns and operates the MLSES located approximately 5 miles southeast of Tatum, Rusk County, Texas. The MLSES consists of three coal-fired power generation units. CCRs including fly ash, bottom ash, and gypsum are generated as part of the MLSES unit operations. Currently, CCRs generated at the MLSES are transported off-site for beneficial reuse by third-parties or are managed by Luminant in surface impoundments located on the MLSES property or at the A1 Area Landfill located approximately 2.5 miles east of the MLSES. The following three MLSES CCR unit areas are regulated under the TCEQ CCR Rule (30 T.A.C. Chapter 352):

- East Ash Pond, West Ash Pond, and New Scrubber Pond (collectively referred to as the Ash Pond Area);
- Permanent Disposal Pond 5 (PDP-5); and
- A1 Area Landfill.

**ATTACHMENT 10**

**Closure Plan Addendum 1 Replacement Pages – A1 Area Landfill, Ash  
Ponds, and PDP-5**

**Closure Plan Addendum 1 Replacement Pages – A1 Area Landfill**



## **2.3 Settling and Subsidence – A1 Area Landfill System**

40 C.F.R. §257.102(d)(3)(i)(D) states that the disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence. An evaluation of potential settlement for the final cap/cover systems for the A1 LF is attached as Appendix B to this Addendum. The A1 LF Closure Plan will be updated to include a cap/cover system settlement evaluation using site-specific data during design of the final cap/closure systems for the landfill. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

## **2.4 Slope Stability – A1 Area Landfill Cap/Cover System**

The A1 LF Closure Plan will be updated to include cap/cover system slope stability modeling using site-specific geotechnical data during design of the final cap/closure systems for the landfill. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

## **2.5 HELP Modeling in 2016 Closure Plan**

The 2016 Closure Plan for the A1 LF included Hydrologic Evaluation of Landfill Performance (HELP) model evaluations to compare the permeability of the then-proposed cap to the landfill liner (PBW, 2016). The HELP model evaluations in the 2016 Closure Plan have been replaced by the infiltration evaluations presented above for the new cap/cover system and have been deleted from this amended Closure Plan.

## **2.6 Conclusions**

The final cap/cover system for the A1 LF described above complies with the final cover system requirements of 40 C.F.R. §257.102(d)(3)(i)(A) through (D).

## **Closure Plan Addendum 1 Replacement Pages Ash Ponds**

$k$  = hydraulic conductivity of Infiltration Layer (m/s)

▪ Assumptions:

- 1) The 18-inch infiltration layer is assumed to have a maximum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec.
- 2) The hydraulic head above the infiltration layer was assumed to be 12 inches (30.48 cm). This is a conservative assumption for the infiltration layer, since the final cap/cover system will be sloped to divert water that infiltrates through the overlying erosion soil layer away from the infiltration layer.
- 3) Cap area for evaluation is assumed to be 1 acre to match area used for the above Ash Pond geomembrane/GCL cap evaluation.

▪ Flow Rate Through 18-inch Infiltration Layer

$A = 1$  acre (4046.86 m<sup>2</sup>)

$k = 1 \times 10^{-7}$  cm/sec ( $1 \times 10^{-9}$  m/sec)

$h = 1$  foot  $\times$  30.48 cm/ft = 30.48 cm (0.3048 m)

$t = 18$  inches  $\times$  2.54 cm/in = 45.72 cm (0.4572 m)

$Q = (4046.86 \text{ m}^2) \times (1 \times 10^{-9} \text{ m/sec}) \times ((0.3048 \text{ m} / 0.4572 \text{ m}) + 1)$

$= 6.75 \times 10^{-6} \text{ m}^3/\text{s}$  per acre of cap or 154 gallons per day per acre of cap

The final cap/cover systems for the Ash Ponds comply with the requirements of 40 C.F.R. §257.102(d)(3)(i)(B), since the estimated liquid flow rate through the final cap/cover system (0.10 gallons per acre per day) is significantly less than the estimated liquid flow rate through an 18-inch thick infiltration layer (154 gallons per acre per day).

## 2.2 Equivalent Erosion Protection - Ash Pond Cap/Cover Systems

The final cap/cover systems for the Ash Ponds include an 18-inch erosion layer consisting of 12 inches of general fill overlain with 6 inches of soil capable of supporting native vegetation. This complies with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(B), which states that the final cover system must use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

## 2.3 Settling and Subsidence - Ash Pond Cap/Cover Systems

40 C.F.R. §257.102(d)(3)(i)(D) states that the disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence. An evaluation of potential settlement for the final cap/cover systems for the Ash Ponds is attached as Appendix A to this Addendum. The Ash Pond Closure Plan will be updated to include a cap/cover system settlement evaluation using site-specific data during design of the final cap/closure systems for the Ash Ponds. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

## 2.4 Slope Stability - Ash Pond Cap/Cover Systems

The Ash Pond Closure Plan will be updated to include cap/cover system slope stability modeling using site-specific geotechnical data during design of the final cap/closure systems for the Ash Ponds. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

**Closure Plan Addendum 1 Replacement Pages – PDP-5**

$$Q = (4046.86 \text{ m}^2) \times (1 \times 10^{-9} \text{ m/sec}) \times ((0.3048 \text{ m} / 0.4572 \text{ m}) + 1)$$
$$= 6.75 \times 10^{-6} \text{ m}^3/\text{s per acre of cap or 154 gallons per day per acre of cap}$$

The final cap/cover system for PDP-5 complies with the requirements of 40 C.F.R. §257.102(d)(3)(i)(B), since the estimated liquid flow rate through the final cap/cover system (0.32 gallons per acre per day) is significantly less than the estimated liquid flow rate through an 18-inch thick infiltration layer (154 gallons per acre per day).

## **2.2 Equivalent Erosion Protection – PDP-5 Cap/Cover System**

The final cap/cover system for PDP-5 includes an 18-inch erosion layer consisting of 12 inches of general fill overlain with 6 inches of soil capable of supporting native vegetation. This complies with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(B), which states that the final cover system must use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

## **2.3 Settling and Subsidence – PDP-5 Cap/Cover System**

40 C.F.R. §257.102(d)(3)(i)(D) states that the disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence. An evaluation of potential settlement for the final cap/cover system for PDP-5 is attached as Appendix A to this Addendum. The PDP-5 Closure Plan will be updated to include a cap/cover system settlement evaluation using site-specific data during design of the final cap/closure system for PDP-5. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

## **2.4 Slope Stability – PDP-5 Cap/Cover System**

The PDP-5 Closure Plan will be updated to include cap/cover system slope stability modeling using site-specific geotechnical data during design of the final cap/closure system for PDP-5. An amendment will be submitted prior to construction for review and approval. The amendment will include 1) site-specific geotechnical data, 2) final cover materials testing data, and 3) final design criteria, with all analyses, and shall be signed and sealed by a Texas Licensed P.E. (with Firm Number if applicable).

## **2.5 HELP Modeling in 2016 Closure Plan**

The 2016 Closure Plan for PDP-5 included Hydrologic Evaluation of Landfill Performance (HELP) model evaluations to compare the permeability of the then-proposed cap options against each other and to the PDP-5 bottom liner system (PBW, 2016). The HELP model evaluations in the 2016 Closure Plan have been replaced by the infiltration evaluations presented above for the new cap/cover system and have been deleted from this amended Closure Plan.

## **2.6 Conclusions**

The final cap/cover system for PDP-5 described above is an alternative final cover system that complies with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(A) through (C).