

HYD-03 Response

HYD-03 Information Needs:

Please provide a knowledgeable expert to discuss post-construction grading plans, the planned removal of regolith/undifferentiated fill, planned placement of engineered fill and the impact this will have on infiltration and surface runoff characteristics, groundwater gradients and flow paths.

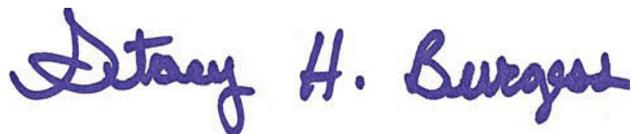
Action:

Applicant will provide the rationale for the post construction flow path for groundwater. The narrative will be included in the hydrogeology package.

Response:

The CPNPP Unit 3 and 4 site is situated on a hydraulic high where surface water infiltration and groundwater flow are controlled by topography. The shallow (perched) groundwater at the site is contained almost wholly in the thin veneer of soil residing on top of the Glen Rose Formation. Currently in the area of the site, the surface water and groundwater essentially drains into Squaw Creek Reservoir (SCR).

The current soil and rock material comprising the hydrologic A-zone (regolith) and B-zone (upper Glen Rose) will be removed for construction and will result in the removal of the perched groundwater from the power block area. Post-construction surface water infiltration to the Glen Rose Formation limestone will be reduced by the construction of surface water diversion and impoundment features and by a drainage system throughout the Unit 3 and 4 areas. The planned post-construction site grading and drainage plan and placement of engineered fill material are designed to preclude surface water buildup near the plant foundation. This will reduce the possibility of surface water infiltration into the limestone on which the foundation will be constructed. During construction, the undifferentiated fill material and regolith will be removed in the power block area and replaced with engineered fill material. Shallow bedrock will be excavated from the plant foundations. The removal of the A-zone in the power block area will remove overlying perched water, reducing infiltration into the B-zone. Improved storm water controls and the placement of engineered fill material will reduce surface water infiltration in power block area and will also serve to eliminate perched groundwater currently measured in the B-zone. Additional information is presented in the attached "Impact to Ground Water Flow Path at Surface Under Post Construction Conditions" (Tracking No. HYD-3) and Luminant Letter No. TXBN-08031 responding to RAI #1.



4/22/09

Signature

Date

Impact to Ground Water Flow Path at Surface Under Post Construction Conditions (Tracking No. HYD-3)

This narrative covers the civil design requirements associated with the following areas: stormwater drainage system, soil erosion and sedimentation control, and grading associated with the proposed site work. Grading and drainage shall be designed to facilitate the construction and operational needs for the proposed nuclear power plant. Stormwater shall be directed away from the facilities via the site grading and the stormwater drainage collection and conveyance system which includes catch basins, headwalls, pipes and swales. Existing drainage flow paths will be modified to facilitate the above plant arrangement. Stormwater runoff best management practices will be utilized prior to discharge downstream. The design of the stormwater management system is in accordance with all applicable codes and standards listed as follows:

- Texas Commission on Environmental Quality (TCEQ)
- TPDES General Permit (TXR150000)
- Edwards Aquifer Technical Guidance on Best Management Practices
- Texas Department of Transportation (TxDOT) Hydraulic Design Manual
- United States Department of Agriculture (USDA) Technical Release 55 (TR-55)
- Local and County Codes and Standards

Grading: Proposed finished floor and grade elevations are evaluated to facilitate adequate drainage away from structures. The proposed earthwork grading, soil compaction and final surface treatment (i.e. grass, stone, paving and roofs) result in an increase in stormwater runoff. Stormwater basins to attenuate and treat the stormwater runoff are proposed in accordance to the above requirements.

Groundwater: Groundwater beneath (lower than) earth moving activities will remain unchanged. Water table is below excavation. Encountered perched groundwater will be removed as required during earth work activities. The excavation will be pumped to sediment removal filter media prior to discharge downstream. No dewatering is currently planned for the site after construction.

Construction Sequencing: The erosion and sedimentation pollution control devices will be sequenced to provide pollution protection from the initial phase of the earth work which includes the utilization of filter fabrics, rock filters, sediment trap, and basin construction.

Stormwater Drainage and Conveyance:

- **Stormwater System Design Basin:** The hydrology for the project is based on the NRCS Method (formerly SCS). The NRCS TR-55 is used to design the detention basins. Peak drainage discharge is calculated based on the Rational Method. Pipe and open free flow hydraulics are calculated based on Manning's Equation.
- **Construction Period Stormwater Drainage Design:** Sedimentation basin design is based on calculation to provide storage for a calculated volume of runoff from a 2-year, 24-hour storm or which provides 3,600 cubic feet of storage per acre drained, whichever is greater, depending on site area limitations. Sedimentation basin design considers site soils, slope,

available area, precipitation patterns, site geometry, vegetation, infiltration capacity, geotechnical investigations, depth to groundwater, public safety and other considerations.

- **Operating Plant Stormwater Drainage Design:** Based on calculation and analysis of the 100-year, 24-hour storm event for the preconstruction and post construction site. Retrofit of the sedimentation basin for the post construction drainage system is based on comparison of sedimentation basin design of the 100-year, 24-hour storm event to the construction period sedimentation basin.
- **Operating Plant Storm Drainage Materials:** The proposed stormwater drainage system is designed to accommodate the existing and proposed stormwater discharges with the implementation of a new piping network, swales not steeper than 1 vertical, 2 horizontal and detention basins. Pipelines are High Density Polyethylene (HDPE) pipe and/or Reinforced Concrete Pipe (RCP) as site conditions may warrant. Pipelines are designed to provide self-cleansing velocities (minimum 2 ft/s) and are laid with a minimum clear cover of 1.0 foot where possible. Catch basins and manholes are precast concrete. Manhole covers and inlet gratings are designed for heavy duty traffic.
- **Stormwater Discharge Permitting Requirements:** Site stormwater during construction and post construction are designed in accordance with and to facilitate all permits required. Review of facility's Compliance History Ranking and permit regulations are per TCEQ. Notice of Intent (NOI) are prepared for stormwater discharges associated with construction activity under TPDES General Permit TXR150000. Texas Pollutant Discharge Elimination Systems (TPDES) General Permit TXR150000 for the discharge of storm waters associated with construction activities for the proposed site work are submitted to TCEQ. Stormwater Pollution Prevention Plan (SWP3) are prepared per TCEQ General Permit TXR150000 and address Site Description, Soil type analysis, Site plan with drainage patterns, slopes, sequence of grading, etc., Best Management Practices and erosion and sediment controls, Offsite transfer of pollution controls, Stabilization practices, Structural control practices, Permanent stormwater controls. Review and design Best Management Practices (BMPs) are implemented per TCEQ and Edwards Aquifer Technical Guidance on Best Management Practices.