

**Engineering Review Requirements
For Pipeline Crossings of Streams/Rivers (bed and banks) owned by SARA**

1. The overall goal of these requirements is for the applicant to design and construct pipeline infrastructure projects with minimal disruption to the bed and banks of the stream, the public and the environment during construction as well as the long-term operation.
2. Streams are naturally dynamic systems and profile designs should expect streams to move horizontally and laterally over time. Typically, pipe profiles shall have a minimum of 11 feet of clearance between the top of pipe and the elevation of the thalweg of the stream cross-section for a minimum distance of 100 feet horizontally in each direction from the thalweg station. SARA may increase this minimum requirement during review of project sites depending on site specific factors contributing to the anticipated rate and direction of long-term stream movement.
3. Typically, only horizontal directional drilling or bore and jack construction methods will be considered for approval. Bore and jack sending and receiving pits must be located outside of the 10 year frequency storm limits and/or the required clearance distances from the thalweg, whichever is greater and must have the approval of the FEMA FPA if within the 1% chance annual storm as noted below. Directional drilling pits shall be constructed well beyond the top of bank.
4. Design plans proposing open cut will only be considered on dry creeks with a contributing drainage area less than 100 square miles. Plans for open cut will require engineer sealed plans and bonding amounts sufficient to guarantee re-establishment of the channel bed and bank stability to the satisfaction of the SARA Engineering Manager. Additional review and approval time should be anticipated to resolve all site issues in regards to open cut requests.
5. Provide SARA with a map showing no activities within the 1% annual chance floodplain (100-yr) or certification of compliance from the local floodplain administrator for proposed activities.
6. Any modifications to the channel or floodplain should include hydrology and hydraulics modeling for review and comment and that assure no downstream impacts from the proposed temporary or permanent activities. In addition, certification of compliance from the local floodplain administrator should be included.
7. The consultant designing the crossing should assure proper depth of utility to prevent exposure from localized scouring caused by improvements, if present, in the stream corridor. In such cases, applicant shall coordinate with local floodplain administrator to determine appropriate scour protection depths.
8. The minimum cover requirements required by SARA do not release the Owner from responsibility to remove and replace sections of pipe if exposed in future years. The Owner shall provide periodic inspections of the pipe alignment in future years to anticipate and communicate any potential problems to the SARA in advance of pipe exposure. Exposed pipelines are considered a potential safety and environmental hazard risk that remain the responsibility of the pipe Owner to correct in a timely manner.

9. Contact Ronnie Hernandez of the San Antonio River Authority (SARA) at least 72 hours prior to any drilling activities. Contact must be made person to person and not thru email or phone messages. A site meeting to discuss the crossing must include a representative from the Pipeline and Boring companies. A review of site vegetation and topography will be conducted prior to beginning work.
10. Best management practices for environmental and safety contingency plans must be in place prior to any activities. Typical items include but are not limited to silt fencing, hay bales, plastic sheeting, pumps and hoses, and vacuum truck.
11. A fracture mitigation plan (FMP) must be prepared and posted on-site in the event of a leakage of drilling mud to the surface or stream bed (frac-out). All work will stop and the frac-out will be contained. SARA will determine if and when the drilling operations can resume. The on-site foreman must be competent in all aspects of the drilling activity.
12. All equipment listed in the FMP shall be on site when drilling within 100 feet of the stream.
13. No drilling activities within the bed and banks of any river or stream will be allowed without the River Authority being on-site.
14. No water from any river or stream will be used in any activity without prior permit approval from TCEQ.
15. The site will be properly cleaned up and all debris removed. Restore site to original or better condition.
16. Provide SARA with the following within 30 days of completion: Test result of the line, air or water pressure; MSDS sheets of all chemicals and products used on-site; and documentation of the actual pipeline elevations under the river. Failure to produce close-out documentation may prohibit any and all future crossings for that company.
17. SARA is not responsible for any damages, property or personal, related to the crossing.
18. SARA's review is based upon general compliance with the contract documents only and does not infer approval of the proposed design or construction operations. Sole responsibility for correctness and safety of the design and construction operations remains with the applicant.
19. This document is subject to revisions at any time and is provided for informational purposes only.

Revised March 9, 2011