Technically Complete, March 11, 2016

PART II

APPLICATION FOR PERMIT
TYPE I MUNICIPAL SOLID WASTE FACILITY
MSW PERMIT NO. 2374

PESCADITO ENVIRONMENTAL RESOURCE CENTER

SOLID WASTE MANAGEMENT AND DISPOSAL FACILITY
RANCHO VIEJO WASTE MANAGEMENT, LLC
LAREDO, WEBB COUNTY, TEXAS

Sections 1.1, 1.2, 2.1.4, 10.1—10.4, 11.1 – Signed by H.C. Clark, P.G., Ph.D. on Feb. 7, 2012

Except for Sections 1.1, 1.2, 2.1.4, 10.1—10.4 and 11.1 – remaining portions of Part II through February 17, 2012 revisions were signed/sealed by James F. Neyens, P.E. on February 24, 2012.

Originally Prepared By:

TRC Environmental Corporation

TBPE Firm Registration No. 3775

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Revised on June 12, 2014 by:

Shaw Environmental, Inc. (a CB&I company)
TBPE Firm Registration No. F-5650
and
H.C. Clark P.G., Ph.D. for Sections 1.2, 2.1.4 and 11.1

Revised July 25, 2014; April 20, 2015 and September 2015 By:
CB&I Environmental and Infrastructure, Inc.

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
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1.0 EXISTING CONDITIONS SUMMARY – [330.61 (a)]

This section discusses site-specific conditions that require special design considerations and mitigation of conditions that exist at the site of the proposed 952.89-acre Pescadito Environmental Resource Center (PERC), located about 20 miles east of Laredo in Webb County, Texas (see Figure 1, Part I and Figure 1, Part II).

1.1 Soils and Geology

A series of 56 soil borings were completed to evaluate the characteristics of soil encountered in the upper 160 feet at the site. These soils are predominantly clays, with some interbedded sand, sandstone, and claystone or shale. Based on review of published reports and geophysical logs, these or similar soils are believed to extend to much greater depths. Laboratory testing of these soils confirms that they are well suited for the location of a solid waste landfill and to be used for the construction of the proposed landfill's liners and cover systems, and for storm water management structures such as channels, detention ponds and dikes. These soils have very low permeability characteristics and are resistant to erosion, both in the natural or *in situ* condition and when constructed into compacted clay liner systems. These soils also are resistant to erosion.

The geology of the site area is also suitable for landfill development, as the soil strata are laterally very extensive with relatively thick layers of very low permeability soils that prevent vertical migration of water. Consequently, the area geology is very protective of the quality of water in the aquifers that lie below the proposed facility. There are no recognized geological hazards at the site, as there are no geologic faults in the immediate area, the risk of seismic activity is extremely low, and there is no known incidence of instability due to subsidence, poor foundation conditions, or karst terrains.

1.2 Groundwater

Groundwater was encountered beneath the site within soils of the Jackson and Yegua Groups. These soils are part of the Jackson-Yegua Aquifer, which is classified as a minor aquifer by the Texas Water Development Board (TWDB). This classification is due to the relatively low yield and marginal quality of water in the aquifer. The ground water below the site was encountered in several water-bearing zones or layers that are generally characterized by gradational changes to sandy or silty soil classifications. These water-bearing zones are generally on the order of several feet thick and are found at several depth intervals across the site. These water-bearing zones may also be found layered as a transition between two highly impermeable layers of clay soil or at the top of a relatively impermeable layer of rock-like indurate material, and may also be associated with secondary porosity in the over-consolidated clay soils. These water bearing zones exhibit the characteristics of a confined aquifer. However, the hydraulic characteristics or

relative thinness of these zones severely limit their ability to produce water in potentially useful quantities. The quality of this water is very poor to unacceptable for most domestic or agricultural uses. Regional aquifers exist beneath the site, but at significant depth. The Laredo Aquifer is expected to occur at a depth of about 1,000 feet or more below the ground surface. Water in this aquifer is generally slightly saline, with total dissolved solids in the range of 1,000-2,500 milligrams per liter (mg/l), about two to five times the U.S. EPA's secondary drinking water regulation (SDWR) standard of 500 mg/l. Published reports indicate the groundwater produced by some wells contain some metals and trace elements in excess of SDWR limits. This and other deeper aquifers in south central Webb County dip towards the southeast towards the Gulf of Mexico and generally crop out in relatively narrow bands that trend northeast-southwest.

Groundwater usage in the general area of the site is very limited. Only one water well is known to exist within a one-mile radius of the facility boundary. This is the private water well that is located near the Yugo Ranch headquarters' buildings and serves the general needs of the ranch. This well is located roughly 1,575 feet southwest of the proposed facility. The ranch well was geophysically logged as part of this study and the caliper log indicates that the well is screened in the Yegua from about 1020 feet to 1136 feet where the diameter is reduced to final log depth [1160 feet], suggesting a smaller screen or sediment trap. According to TWDB records and information developed during the preparation of this permit application, there are only 8 water wells within a five-mile radius of the facility, including this ranch well. The next closest wells are about 1.4 miles southeast and 2.5 miles northwest of the facility. Three wells appear to be located between 4.3 and 5 miles northwest of the facility, in the community of Ranchitos Las Lomas. One of these is a well located right at 5 miles away that is owned and operated by Webb County. This well was intended as a public water supply well to make dispensed water available to the residents of Ranchitos Las Lomas. Water quality from this well is so poor that the majority of the water dispensed at this site is hauled by tanker trucks from the Webb County maintenance facility near U.S. Highway 59 and Loop 20 in Laredo. The source of this hauled water is the Laredo public water system. Of the total quantity of water Webb County dispenses at this location, relatively little water comes from this well, and that follows extensive treatment. Two wells are located nearly five miles to the southwest of the site. Refer to Part III, Appendix III-E.1 for additional information.

1.3 Site Size and Topography

The site contains approximately 953 acres and is roughly rectangular in shape, as shown on Figure 3, Part II. It is nearly one mile measured east to west and less than two miles measured north to south. For the most part, the site topography is gently sloped from north to south at about 0.5 to 1 percent. Several shallow swales gather storm water runoff and convey it southward. Several stock tanks have been constructed within the site

to collect and store runoff for livestock watering. The relative uniformity of the terrain will facilitate design and construction of the landfill and supporting features, particularly management of storm water.

1.4 Rainfall, Hydrology and Storm Water Runoff

According to the *Soil Survey of Webb County, Texas,* published by the U.S. Department of Agriculture, Soil Conservation Service (1985), rainfall at Laredo averaged 19.8 inches per year between 1931 and 1979. Monthly averages ranged from 3.2 inches in September to 0.5 inches in March. An average of 13.9 inches, or 70 percent of the annual amount, fell in the 6 month period from May through October. Since Laredo is only about 20 miles west of the site, it is believed this rainfall data is also representative of the site.

Because the site slopes rather gently from north to south at about 0.5 to 1 percent, near-surface soils have very low permeability, and the site is uniformly covered with native vegetation consisting of brush, forbs and grass, surface water hydrology is relatively consistent. Storm water runoff historically has not eroded bed-and-bank features into the shallow swales that covey drainage from the site. In recent times, several impoundments have been created on site by shallow excavation and embankment construction across the swales to create livestock watering tanks. Patterns of storm water runoff have thus been significantly altered by the capture of rainfall by these tanks.

The *Texas Water Atlas* (Estaville, Lawrence & Earl, Richard A., River Systems Institute at Texas State Univeristy, Texas A&M Press, 2008) provides the following site-specific hydrologic information:

- Average Annual Precipitation is 22-23 inches (period 1971-2000).
- Annual Potential Evapotranspiration (Priestly Taylor Method) is 76 inches.
- Annual Potential Evapotranspiration (Penman Method) is 106 inches.
- Annual Gross Lake Surface Evaporation is 79 inches (period 1950-1979).

The site is considered an arid location and is located at the boundary of the "Subtropical Subhumid" and "Subtropical Steppe" climates. Currently-published information documents that average annual evaporation exceeds average annual rainfall by more than 40 inches.

1.5 Floodplains

Because the swales that convey drainage across the site are so wide and shallow, they are quite inefficient at conveying runoff. As a result, relatively wide areas of the site are inundated by runoff from the 100-year rainfall event. The flood insurance rate map (FIRM) for the site, as prepared by the Federal Emergency Planning Agency (FEMA), indicates a significant portion of the site to be within Zone A, the 100-year floodplain.

This floodplain is depicted in Figure 11, Part II. The FIRM can also be found in Attachment G of Part II. It is important to realize that the surface topography used to create the FIRM does not appear to include the existing dikes and surface impoundments at the site and in the watershed upslope from the site. An engineering study of the actual surface topography as it currently exists was subsequently performed along with an engineering analysis of drainage at the site and all watersheds above and immediately below the site. A series of drainage channels and detention structures was designed to remove the proposed landfill area from the 100-year floodplain. Furthermore, a Conditional Letter of Map Revision (CLOMR) was submitted to FEMA requesting correction of the existing FIRM to take into account the proposed drainage and floodplain improvements. The CLOMR was approved by FEMA on November 21, 2014.

1.6 Threatened and Endangered Species

TRC has performed an initial assessment of threatened and endangered (T&E) species at the site, and subsequently conducted a more detailed biological evaluation. These studies will assure compliance with federal and state requirements for the protection of T&E species and their habitats. These studies have been submitted to the Texas Parks and Wildlife Department (TPWD) and the U.S. Fish and Wildlife Survey (USFWS), as discussed in Section 14.0. Subsequent to these studies, aci Consulting performed a Biological Assessment and received notice from the U.S. Fish and Wildlife Service that the proposed project had complied with section 7(a)(2) of the Endangered Species Act, and concurred that the project would have no effect on four of the species identified (ocelot, interior least tern, ashy dogweed and Johnston's frankenia) and would not adversely affect the jaguarundi due to its closest observation being 44 miles to the north and the proposed conservation measures that will benefit the species should they be in the vicinity of the project site. See Part II, Attachment A for a copy of the Biological Assessment and correspondence from the USFWS.

1.7 Land Use

Land use at and within one mile of the facility is exclusively devoted to cattle ranching and oil and gas exploration and production. This same land use extends generally for many miles in every direction. The only exceptions are an area of residential land use about four miles to the northwest and two transportation corridors. The residential land use is in the community of Ranchitos Las Lomas, which is located along Highway 59 and had a population of 334 in the 2000 census. The transportation corridors include U.S. Highway 59, which passes through Ranchitos Las Lomas four miles to the northwest, and the Kansas City Southern Railroad about two miles to the south of the facility, which will provide rail service to the site.

1.8 Oil and Gas Production

While some oil but mostly gas production has been prevalent in the area, very little has actually occurred on the proposed site of the facility. Several wells were attempted on or adjacent to the site, but have been sealed and abandoned. The width of the landfill was selected to allow possible future development of gas reserves beneath the landfill by using directional drilling methods. Existing practices employed by energy companies in

this area of Webb County were reviewed to identify the appropriate well spacing and horizontal departure allowances.

Recovery of landfill-generated gas is planned for the facility. At an appropriate time in the future, the owner or operator may apply to TCEQ for a registration to allow for recovery of landfill gas. The existing infrastructure of gathering pipelines, valves, and separators is expected to be useful to or at least compatible with the landfill gas recovery. The landfill gas will be processed on-site, to the degree necessary to make this gas marketable. Processing may include drying and/or removal of carbon dioxide or trace gases. The landfill gas will then be metered and pumped into the existing natural gas delivery system.

The oil and gas production at and around the site has resulted in a number of wells and pipelines being installed. Every production well has a certain useful or productive life, which ends when the oil or gas reserves it tapped is no longer recoverable. Some wells and pipelines in the site area are no longer active and have been abandoned in place, while others continue in service. Many of these pipelines exist within easements. The easement agreements allow the landowner (the Applicant for this permit) to reroute the pipelines as may become necessary in the future, as long as the replacement pipelines meet industry standards. Also, ownership of the easement and pipelines typically reverts to the landowner if the pipeline operator abandons the line. Similarly, ownership of abandoned wells reverts to the landowner. For these reasons, the proposed landfill is fully compatible with the existing oil and gas production. As the landfill grows in size over several decades in the future, the existing active oil and gas wells will transition into abandonment. New wells can be drilled if desired, because they can be located where they can access hydrocarbons beneath the landfill with directional drilling, and not interfere with the construction and operation of the landfill.

2.0 WASTE ACCEPTANCE PLAN [330.61 (b)]

2.1 General

2.1.1 Type of Facility and Wastes to be Accepted – The facility will be a Type I municipal solid waste landfill, with several additional waste management units. As a Type I landfill, the facility will be designed for and will accept certain types of non-hazardous industrial wastes that are compatible with landfill disposal, and will also accept liquid municipal and industrial wastes. Waste management units for liquid wastes will include solidification (prior to landfill disposal) or underground injection by means of a Class 1 injection well (future units). Design considerations will be made to ensure that storm water and wastewater management are in compliance with TCEQ regulations. Authorization of the Class 1 injection well is not being requested at this time and the appropriate authorization will be obtained prior to construction of any Class 1 injection well. All contaminated liquids resulting from the operation of the facility will be disposed of in a manner that will not cause surface water or groundwater pollution. Grease trap and grit trap wastes will be accepted for solidification and possible processing for beneficial recovery in future waste management units upon TCEQ approval. Processing of recyclables, such as those collected by residential curbside collection programs, may be provided. This process will seek to recover all recyclable commodities that have a market or reuse value, coupled with landfill disposal of non-recyclable residuals.

2.1.2 General Prohibitions- The following wastes will not be accepted for landfill disposal at this facility:

(1) Lead acid storage batteries.

(2) Do-it-yourself used motor vehicle oil

(3) Used oil filters from internal combustion engines.

(4) Whole used or scrap tires, unless processed prior to disposal in a manner acceptable to the executive director.

(5) Refrigerators, freezers, air conditioners, and any other items containing chlorinated fluorocarbon (CFC).

(6) Liquid waste, except as allowed in 30 TAC §330.177 (relating to Leachate and Gas Condensate Recirculation), and/or except household liquid waste as allowed by30 TAC §330.15(e)(6) will not be accepted for disposal in any MSW landfill unit.

(7) Regulated hazardous waste as defined in 30 TAC §330.3.

(8) Polychlorinated biphenyls (PCB) wastes, as defined under 40 Code of Federal Regulations Part 761, unless authorized by the United States Environmental Protection Agency and the MSW permit.

(9) Radioactive materials as defined in 30 TAC Chapter 336 (relating to Radioactive Substance Rules), except as authorized in Chapter 336 or that are subject to an exemption of the Department of State Health Services.

2.1.3 Management of Industrial and Special Wastes – The facility will accept certain Class 1 non-hazardous, Class 2 and Class 3 industrial wastes, as well as many special wastes that are regulated as municipal solid waste (MSW). Only those Class 1 non-hazardous wastes that are allowed to be disposed into Type I MSW landfills in restricted locations will be accepted. The facility will also provide on-site solidification of certain types of industrial and municipal liquids and sludge to render these wastes suitable for landfill disposal. Grease and grit trap wastes will be accepted for solidification (and possible future processing) from commercial sources (restaurants, fast food facilities, car wash and vehicle maintenance facilities), industrial sources (food processing plants, manufacturing plants) and institutional sources (hospitals, schools, prisons). Class I Industrial Waste amounts will not exceed 20 percent of the total amount of all waste accepted for disposal. Special design considerations will be made in accordance with 30 TAC §330.173 to properly manage any Class I waste that is proposed to be accepted for disposal at the landfill. Special wastes will be accepted only to the extent that any given category or type of special waste can be properly managed by the facility and/or readily disposed into the landfill.

Class I Industrial Waste will be disposed only in landfill cells lined with the industrial waste default design composite liner. The upper component shall consist of a minimum 30-mil (0.75 mm) flexible membrane liner and the lower component shall consist of at least a three-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. Flexible membrane liner components consisting of high density polyethylene shall be at least 60-mil thick. The flexible membrane liner component shall be installed in direct and uniform contact with the compacted soil component. Class I Industrial Waste cells shall have a leachate-collection system designed and constructed to maintain less than a 30-cm depth of leachate over the liner.

2.1.4 Soil and Groundwater – The soils encountered during drilling and described in the literature are dominantly clays. While the bottom and sides of the landfill excavation could encounter thin, isolated sand/silt units with a Unified Soil Classification of "SM" or "SP," these soil units do not appear to be sufficiently thick and laterally continuous to provide a significant pathway for waste migration. In addition, most of these units will not exhibit hydraulic conductivity greater than 1×10^{-5} cm/sec. However, any effect of the sand/silt units is minimized because the average annual evaporation exceeds average annual rainfall by more than 40 inches. The nearest "regional aquifer" is located approximately 1,000 feet below the site, according to regional cross-sections, the literature, geophysical log data obtained from the ranch water well located 1,575 feet from the facility, and geophysical log interpretations for gas wells in the site area. The ranch water well produces water from that depth. As a consequence of the prevailing soil

conditions, the aquifer is protected by many hundred feet of low-permeability, clay-rich soil. References include Baker, Barnes and Lonsdale in Section 10.0.

2.2 Sources and Characteristics of Waste

The proposed facility will be a comprehensive waste treatment and disposal facility that serves municipal and industrial customers by means of truck and rail transportation. Municipal solid wastes transported by truck are expected to originate in Webb and nearby counties. The use of tractor-trailers loaded at transfer stations could extend the service area to more distant areas of South Texas such as Corpus Christi and San Antonio. Grease trap and grit trap wastes solidified at this facility are expected to be generated in the same service area. Industrial wastes are expected to be generated from this service area plus the industries in the Houston-Beaumont region. Wastes transported by rail can be economically shipped from greater distances, because the transportation cost per ton-mile is much less by rail than by truck. In regions of the country where the cost of landfill disposal is relatively high and landfills are some distance away and served by trucks, the cost of solid waste disposal by rail-hauling to this facility could be less. Thus, the service area for rail-hauled waste may essentially be unlimited.

Sources of non-industrial waste that are intended to be managed at the proposed facility include local governmental entities (cities, towns, waste management districts or authorities, and counties), state institutions, federal agencies that generate waste from disaster response, commercial solid waste collection companies, and similar generators of municipal solid waste. Wastes to be received other than industrial waste can be characterized as garbage, rubbish, ashes, street sweepings, incidental dead animals, and non-recyclable residuals following the removal of recyclables from source-separated recyclable materials. Solids resulting from the solidification (or future processing with prior TCECQ approval) of grease and grit trap wastes will also be disposed in the landfill.

A main line of the Kansas City Southern Railroad (KCS) passes within about two miles of the landfill facility and is accessible by all-weather roads on private property. Rail service to the site can be accomplished without having to transport waste over public roads. However, in the initial period of operation, waste may be transported in sealed, steel containers through the KCS intermodal shipping yard in Laredo.

KCS is an international railroad company with extensive track mileage and service in Mexico. The facility intends to provide waste disposal services to industrial generators in Mexico. Both the *maquiladora* industries along the U.S. border and other industries in Mexico will be served by the facility.

2.3 Quantity of Waste

Estimated Maximum Annual Waste Acceptance Rate - The facility estimates that it will receive the following maximum annual quantities of waste for landfill disposal during the first five years of its operation, and the population equivalent represented by these quantities:

Year 1 – 1,000,000 tons	(1.1 million)
Year 2 – 1,200,000 tons	(1.3 million)
Year 3 – 1,400,000 tons	(1.6 million)
Year 4 – 1,600,000 tons	(1.75 million)
Year 5 – 1,800,000 tons	(2.0 million)

It must be noted that these figures are estimates only at this time, and should not be considered either as a firm commitment of quantities to be received or as a limitation on the amount of waste to be received in any of the years shown. The actual quantities to be received are expected to be determined by contracts the owner or operator anticipates securing from waste generators after the facility is closer to being in operation. The facility will be constructed to have sufficient processing and disposal capacity available and sufficient numbers of personnel and equipment, to properly manage the waste streams that are brought to the facility.

The liquid waste solidification facility is expected to receive a maximum of 30,000 gallons per day in the first year of operation. The maximum and average lengths of time this waste will remain at the facility prior to disposal are summarized in the following table. Liquid waste will typically be delivered in commercial vacuum trucks and off-loaded into a series of storage tanks. This waste will be transferred to mixing tanks for solidification using various adsorbent materials will be added. Following the solidification time in the mixing tanks, the liquid waste will be considered a solid and will be transferred for disposal. Ultimately grease may be shipped off-site for processing for energy recovery. Grit will be dewatered and landfilled. Remaining water will be managed as contaminated water and treated on site by solar evaporation or solidification (in accordance with TCEQ rules). This water may be hauled off-site for disposal at a wastewater treatment plant under authorization of the plant owner. All aspects of the management of liquid waste, including G&G waste, will be in accordance with TCEQ rules (and U.S. EPA rules if offsite disposal is employed).

LIQUID WASTE

Year after opening	Maximum Receipts, gallons per day	Maximum Receipts, gallons per year	Maximum Storage, days	Average Storage, days
1	30,000	10,800,000	5	3
2	33,000	11,900,000	5	3
3	36,000	13,000,000	5	3
4	39,000	14,000,000	5	3
5	42,000	15,100,000	5	3

The maximum amount of liquid waste, including grease and grit trap waste, to be stored, or total storage capacity, will be 50,000 gallons. The proposed maximum daily waste acceptance rate is 50,000 gallons per day.

3.0 GENERAL LOCATION MAPS [330.61 (c)]

The General Location Map is presented as Figure 1 in Part II. This map is used to present the following described features, to the extent they exist within the distances from the proposed facility as defined by 30 TAC 330.61(c). For clarity, certain of these features are presented elsewhere in this permit application. The prevailing wind direction with a wind rose is presented on Figure 2 of Part II.

There are no water wells on the proposed site or within 500 feet of the proposed permit boundary, except for temporary piezometers and / or groundwater monitoring wells that were installed as part of the development of this permit application. There is one water well within two miles of the proposed site, located about 1,575 feet southwest of the site. This is the water supply well for the ranch. Its location is shown on Figure 1 in Part II.

There are no structures and inhabitable buildings within 500 feet of the proposed facility. There are several structures and inhabitable buildings about 2,100 feet from the facility; these are shown on Figure 1 of Part II. These include two houses, one mobile home, and several ranch buildings (one machine storage building and two sheds used as stables).On occasion, one travel trailer may also be temporarily parked in this area. All residents of these structures are ranch workers employed by Yugo Ranch.

There are no schools, licensed day-care facilities, churches, or cemeteries within one mile of the facility. Several man-made ponds (stock tanks) exist within one mile of the site, and these are shown on the map. There are no other residential, commercial or recreational areas within one mile of the facility, so none are shown; there also are no hospitals in this area. The nearest known airport used for commercial or general aviation is the Laredo International Airport, located more than 20 miles west of the facility.

The location and surface type of roads that will be used to access the facility are shown.

The latitude and longitude of the facility is shown.

Area streams are shown.

There are no airports within six miles of the facility, so none can be shown.

The property boundary of the facility is shown.

Easements within or adjacent to the facility cannot be clearly shown on Figure 1 of Part II. Consequently, for the sake of clarity, all known easements are shown on Figure 4 of Part I. Figure 4 was prepared by Mejia Engineering Company, and consists of Sheets 1 to 4 of 4.

Facility access control features, including a perimeter security fence located along the facility boundary line and at least one lockable gate, are shown of Figure 4, Part II.

There are no recorded archeological, historical or aesthetic sites within one mile of the facility, so none can be shown.

4.0 FACILITY LAYOUT MAPS [330.61 (d)]

A Facility Layout Map and an Operations Area Layout Map are provided as Figures 3 and 4 of Part II. These maps provide:

The maximum outline of the landfill unit(s);

General locations of main facility access roadways;

General locations of buildings;

Explanatory notes;

Fencing and lockable gates will be provided along the facility boundary, as shown on Figure 4, Part II; and

Natural amenities and plans for screening the facility from public view.

Easements are shown on Figure 4, Sheets 1 to 4, in Part I. These easements will be protected in accordance with TCEQ rules until such time as they may be voided or relocated outside the waste fill area.

The site entrance road can be accessed from public access roads.

An initial Class I waste cell location is shown on Figure 4. Additional Class I waste cells may be designated and constructed throughout the landfill as future landfill cells are designed. All Class I waste cells will be designed, constructed, and operated in accordance with TCEQ rules.

Locations of monitoring wells are generally shown on the Monitoring System and Cell Layout Plan, Figure 5. In accordance with 30 TAC §330.403(a)(2), default spacing for groundwater monitoring wells is a maximum of 600 feet. Figure 5 shows a proposed facility perimeter of approximately 28,000 feet. On this default spacing basis, 48 wells are proposed with a maximum spacing of 600 feet.

Locations of gas monitoring probes are generally shown on Figure 5. In accordance with 30 TAC §330.371(h)(2), permanent gas monitoring probes are required to monitor for subsurface migration of landfill gas. Although, 1,000-foot spacing is typical, 600-foot spacing is recommended along the southwest corner of the perimeter due to habitable structures within 3,000 feet. This spacing can be accommodated at the location shown on Figure 5.

The proposed facility is completely isolated from all land use except cattle ranching and oil and gas production, and is provided with an effective separation distance of more than one-quarter mile on three sides and 300 feet on the fourth side.

5.0 GENERAL TOPOGRAPHIC MAPS [330.61 (e)]

The General Topographic Map is presented as Figure 6. It was derived from the United States Geological Survey 7 ½ minute quadrangle map for the site area, identified as the Burrito Tank map. This map is the most recent such map of the site area and was prepared in 1980. It is at a scale of one inch equals 2,000 feet.

6.0 AERIAL PHOTOGRAPH [330.61 (f)]

An aerial photograph of the required size and scale is provided as Figure 7, Part II. The facility boundary is marked and an area within at least a one-mile radius beyond that boundary is shown. The scale of the aerial photograph is one inch equals 2,000 feet, which is within the required range. This photo shows the facility (or site) boundaries and the area within a one-mile radius of the boundary. The proposed fill areas are shown. There has been no growth for many years in the area covered by the aerial photograph, so a series of photographs to show growth trends is not needed because there are no growth trends to show.

7.0 LAND-USE MAP [330.61 (g)]

The Land-Use Map is presented as Figure 8, and shows the existing land uses within one mile of the facility. The land usage presented on this map was obtained by personal observation and examination of recent aerial photographs, and is believed to be accurate as of the date of this photograph, which was taken in 2008. This land use information was checked by visual observation in June 2010. The current land use is shown on Figure 8, and is as described in the Land Use Map Legend.

Current, recent and historic land use within the facility boundary is the same; cattle ranching and production of natural gas. Figure 9 is provided to show oil and gas wells in the area of the facility. Numerous roads, ranging from all-weather gravel surfaced roads to unimproved lanes, exist in the area, primarily to serve oil and gas exploration and production. This very same land use extends for at least 3 to 5 miles in all directions from the facility.

8.0 IMPACT ON SURROUNDING AREA [330.61 (h)]

The proposed addition of the landfill and related facilities at this site will not have an adverse impact on human health or the environment in the area surrounding the facility. There is no existing zoning that would prohibit this proposed use, and no approval or special permit is required from any local government. There is no existing zoning map of the site or surrounding area, so none can be provided herein.

8.1 Potential Impact on Human Health

The following discussion assesses potential human health impacts on cities, communities, groups of property owners and individuals. Due to demographic factors associated with this particular site, and the nature of the proposed landfill and waste processing operations and type of materials to be processed, the only potentially affected category that should be considered is individuals. This is because the site area has a very low population density, with no residential dwelling units within 500 feet of the proposed facility. Fewer than 10 persons live within a one-mile radius of the facility. The closest residential dwelling units are two structures at the Yugo Ranch headquarters about 2,100 feet southwest of the facility boundary. The next closest residential structures are at another ranch headquarters located approximately 2 miles away to the northwest.

There is no city, community, or group of property owners that are potential target receptors that might be subjected to adverse human health impacts from the proposed facility. This is because of the separation distances that will exist and because of the virtual lack of etiological agents or disease vectors that might result in such impacts. The individuals to be considered in the evaluation of health impacts include nearby residents, facility employees, and visitors. This evaluation will consider the potential modes of transmission of etiological agents or disease vectors that might impact human health. The modes are transport by air, surface water and ground water. Transmission by vectors, such as insects (particularly flies) and rodents (particularly rats and mice), are not being considered any further in this analysis because the waste storage and processing methods to be employed at this facility will prevent the propagation or reproduction of these species in or near the waste, and will essentially deny access to the waste to any existing members of these species. Basically, waste will be in closed containers until placed into the landfill, at which time the waste will be covered with additional waste or cover soil. Transmission by dermal contact or ingestion are not realistic modes because all persons who may come in direct contact with waste will be required to wear gloves and will be specifically trained to avoid dermal contact or ingestion of waste or waste materials.

Air Mode - The two nearby houses and one mobile home in the facility area are located to the southwest of the landfill, as shown on the Aerial Photograph, Figure 7. The prevailing wind direction, as shown by the Wind Rose in Figure 2, is not in this direction. In fact, Figure 2 shows that wind blows from the facility towards these two residences only about 5 percent of the time. The three factors of low incidence of wind blowing towards these residences, lack of etiological agents or vectors, and the separation distance of over 2,100 feet, combine to produce a negligible chance of adverse health effects to these residents due to the facility.

The individuals to be considered with respect to potential human health impacts due to inhalation or ingestion are employees of facility and visitors to the facility.

Potential exposure to employees varies by job assignment. Persons who work in the close proximity to waste or waste processing will be provided with National Institute for Occupational Safety and Health (NIOSH)-approved dust masks and will be required to wear them during operations that expose them to dust. Such employees will also be required to wear hard hats, safety glasses, gloves and protective boots while working in this operation. A water truck will be available as needed throughout the facility and will provide water that will be spray-applied when needed to control dust.

Office workers will not be exposed to materials of concern. A supply of hard hats, safety glasses and dust masks will be maintained at the facility for use by visitors or employees who may occasionally enter the waste processing or disposal areas.

Surface Water – The facility will be designed to contain and properly manage all water that has come into contact with waste, including leachate, clean-up water, and rainfall that comes in contact with exposed waste. All such water will be treated or managed on-site, and will not be discharged off-site. Workers who manage this water will be trained and provided with appropriate personal protection equipment to prevent ingestion or dermal contact with this water.

Groundwater – The landfill will be designed and constructed with a liner and leachate collection system that will act in tandem to prevent the migration of waste or waste constituents to groundwater. An array of groundwater monitoring wells will be designed and installed to check groundwater quality and to make sure the liner and leachate collection system is working to prevent release of contaminants to the groundwater. Should such a release occur, it can be detected and corrective measures can be taken before any adverse health impact can occur.

The facility's geological and hydrogeological setting also provide protection of public health, as water quality in the upper aquifer at the facility is too poor to be used for

human consumption. Deeper aquifers are protected from possible site-related contamination by hundreds of feet of intervening very low permeability soil intervals.

8.2 Potential Impact on the Environment

No adverse impacts on the environment of the area are anticipated from the proposed landfill operation. Debris barriers will be employed to reduce the potential for wind-blown dispersal of debris and litter.

Some noise will be generated by the periodic operation of the motorized equipment including waste compactors, bull dozers, hydraulic backhoes and the trucks used to bring and remove waste containers. The frequency and the intensity of the equipment noise generated on-site will be quite low in all off-site directions. This is due to the buffer zone width and the operation of most equipment within a building. Except for trucks entering and leaving, all on-site noise generation will be limited to areas of the facility that are located on private property at least ¼ mile from neighboring property.

8.3 Compatibility with the Surrounding Area

Zoning - The facility is located more than 5 miles east of the City of Laredo and the area surrounding the site within two miles extends into unincorporated Webb County. No specific approval is required from the City of Laredo or Webb County for the proposed facility. The facility is well beyond the extra-territorial jurisdiction (ETJ) of the City of Laredo. Accordingly, the City of Laredo has no authority to establish zoning, land use planning, or other restrictions on development in the area. Similarly, the facility is not within the extra-territorial jurisdiction (ETJ) of any other incorporated city. Webb County has enacted no zoning or similar restriction on land use at the facility or surrounding area.

Character of Surrounding Land Uses - This facility location and the area extending for many miles in all direction are obviously suitable for oil and gas production and cattle ranching. This is the current and historic land use status of the property on which the facility is proposed, and has been for many years. No other residential, recreational, commercial, agricultural or industrial land uses exist for several miles in the site area.

The site is about two miles north of the north end of Jordan Road. This is the closest area to the site that is accessible to the general public, as the access road into the site from Jordan Road is privately owned. Existing residential and several commercial properties are located at Ranchitos los Lomas, about 3.5 to 4.5 miles northwest of the proposed facility. The proposed facility is more than adequately screened from view from both of these areas by a distance of about two to four miles. The intervening areas consist of heavily wooded or brushy vegetation and rolling topography.

Commercial development within one mile of the site is non-existent. Land use is exclusively devoted to the exploration and production of oil and gas and cattle ranching, both of which are commercial ventures, but are not normally considered to be described as commercial development. Oil and gas activity occurs somewhat randomly, but extensively, throughout the general area of the site. One feature of this commercial use is that it requires frequent access to well sites by large, heavy vehicles, such as well drilling rigs, work-over trucks, and tank trucks that haul produced liquids. These heavy vehicles regularly traverse the roads in the site area, and testify to the adequacy of these all-weather surfaced roads to support such truck traffic. Landfill-related traffic will employ vehicles that are similar in many respects to this existing traffic. A second commercial type of land use near the site it the KCS railroad, whose tracks are located within one to two miles of the site.

In addition to the residential, commercial and industrial land use described above, land use within a five-mile radius of the facility is divided between agricultural (essentially all pasture land used for cattle ranching) and dispersed oil and gas well sites.

The closest population center and only concentrated residential land use within five miles of the facility is Ranchitos Las Lomas, a community or subdivision located along Hwy 59 about 3.5 to 4.5 miles northwest of the site. This is a community of about 334 persons, according to the 2000 census. Widely scattered residences are found at several ranch headquarters in the area, but these are typically separated from each other by several miles, due to the large size of the ranches, which appear to be on the order of 10,000 acres each. Typical of these is the Yugo Ranch, within which the proposed facility is located. There are an estimated two or three active residences within one mile of the facility, all located at the headquarters of Yugo Ranch. This includes two houses, one mobile home, and occasionally one travel trailer. These nearest occupied residences house ranch hands that are employed by Yugo Ranch.

Vehicle or equipment noise that will be generated by the proposed solid waste activities may not be discernable and should not be objectionable to occupants of the residences at Yugo Ranch because of the low speeds and separation distance. Prevailing winds, which tend to carry noise in its direction of movement, should carry noise away from these residences. Noise resulting from the operation of the facility will not cause any impact to the community of Ranchitos Las Lomas, located about 4 miles northwest of the facility, due primarily to the separation distance. Also, any noise that could be perceived within a limited distance from the facility will be engine noise associated with heavy equipment. Noise generated by truck traffic travelling to and from the facility will be similar to the noise from oil-field trucks and equipment that already travel along area roads many times a day. Truck traffic noise related to accessing the facility will be indistinguishable from

the noise of truck and automobile traffic along U.S. Highway 59, which bisects this community. This highway traffic consists of many trucks and tractor-trailer units traveling at up to 70 miles per hour, 24 hours per day.

Growth Trends - The population of Webb County (2000 Census) was 193,117, and the population estimate for 2009 is 241,438, an increase of about 25 percent in 9 years. Within a one-mile radius of the facility, the long-term population is estimated to be fewer than 10 persons, and this population has no growth or growth trend. The 2000 population for Ranchitos Las Lomas was 334, which had 148 housing units and a population density is calculated to be 15.3 persons per square mile. According to www.bestplaces.net, the population of Ranchitos Las Lomas was 409 in 2011, an increase of 22 percent in 11 years. Historic population data indicates the population of Ranchitos Las Lomas has been about 300 to 400 persons for many years. Visual observation of this community shows no evidence of recent growth, such as new homes or commercial buildings.

Proximity to Residences and Other Uses – The proximity of the facility to residences is discussed above. There are no schools, churches, cemeteries, historic structures or sites, archaeologically significant sites, or sites having exceptional aesthetic quality within one mile of the facility. The lack of some of these sites or features has been verified. According to Texas Historical Commission (THC) records, there are no archeological or historic sites in the area of the proposed facility. There are no recreational areas within one mile. There are three residences within one mile of the facility, all located at Yugo Ranch headquarters about 2,100 feet southwest of the facility, and no commercial establishments. The estimated population density within a one-mile radius of the facility is less than one person per square mile.

Wells - There are no known or recorded water supply wells, either active or abandoned, within 500 feet of the proposed facility. According to records obtained from the Railroad Commission of Texas, there are no active oil or gas wells on the facility, and one abandoned gas well. Within 500 feet of the facility boundary, there are two active gas wells, three plugged gas wells, and two wells classified as "dry holes".

9.0 TRANSPORTATION [330.61 (i)]

Vehicular traffic associated with the proposed landfill will primarily approach and leave the general area of the facility on State Highway 359, a two lane asphalt-paved road with paved shoulders. Between SH 359 and the site, traffic will travel about 5 miles on Jordan Road, which is a Webb County road, to within about two miles of the site. There is no posted vehicle weight limitation on Jordan Road. The final road leading into the site is an all-weather surfaced private road on Yugo Ranch.

Webb County was given information about the proposed Pescadito Environmental Resource Center, and has expressed support for the project. A copy of a letter from Webb County Judge Danny Valdez stating the county's support is presented in Part II, Attachment E.

Existing and future estimated traffic volumes on SH 359 were not studied in connection with this application. SH 359 is estimated to be a minimum of 5.9 miles from the proposed facility. A review of publicly-available data on Webb County traffic did not produce existing traffic counts or future traffic projections for Jordan Road, which is about 1.1 mile from the closest portion of the proposed facility.

At the initial expected rate of 1,000,000 tons per year (tpy), the expected volume of traffic associated with the proposed landfill is expected to be approximately 260 trips per day (130 vehicles entering and leaving, including 10 passenger vehicles and 120 trucks). Ultimately for 2,000,000 tpy, the facility traffic is expected to be 520 trips per day (260 vehicles entering and leaving, including 20 passenger vehicles and 240 trucks). At this ultimate volume, truck traffic will average about 10 vehicles per hour or one every 6 minutes. This volume of site-related traffic will have no significant adverse impact on the capacity of SH 359. Because of the relatively low volume of site traffic, along with the favorable geometry, reduced speed limit and long sight distance, no turning or storage lanes would be needed to safely accommodate the proposed facility.

The applicant proposes that all site-related traffic will approach the site from the south, via SH 359 and Jordan Road.

TxDOT was provided information about the proposed facility, and has concurred that there will be no adverse impacts from the proposed facility on the State highway system. A letter expressing this conclusion from Albert Quintinella, P.E., TxDOT's Laredo District Engineer, is presented in Part II, Attachment B.

TRC obtained traffic count data from TxDOT for a location on State Highway 359 (SH 359) approximately 3 miles east of Loop 20. This is the location closest to the intersection of SH 359 and Jordon Road for which traffic count data was available. For

the five-year period from 1995 through 1999, the average daily traffic count was 6,080 vehicles per day. The average daily traffic count at this location in 2009 was 8,800 vehicles per day. This is an increase of 2,720 vehicles per day or about 45 percent over an average period of 12 years. Assuming a similar increase will occur over 12-year periods in the future, the 2021 average daily traffic will be 12,760 vehicles per day and the 2033 average daily traffic will be 18,500 vehicles per day. The anticipated site related traffic will not significantly impact the estimated future traffic conditions. This conclusion is shared by TxDOT's District Engineer (see Attachment B, Part II).

Documentation of coordination with the Federal Aviation Administration regarding airport location restrictions is presented in Attachment F.

10.0 GENERAL GEOLOGY AND SOILS STATEMENT [330.61 (j)]

10.1 General Geology [330.61(j)(1)]

The geology of the area is described, in part, by the Laredo Sheet (Barnes, 1976) of the Geologic Atlas of Texas; it shows the site located on the contact between the Eocene Yegua Formation and Jackson Group [of formations in other places where defining characteristics make discrimination relevant]. Other mapping and subsurface research place the contact between the Yegua and Jackson somewhat to the west of the site [for example: Lonsdale, 1937; Baker, 1995; Lambert, 2004]. The differences in interpretation between researchers are likely because the depositional environments and the resulting sediments are similar, leading to different choices of boundaries. Both the Yegua and Jackson are made of clays, clayey sands, and sands, and include, at different locations: limestone concretions, lignite, volcanic ash, uranium, and fossil plants. Beneath the Yegua and Jackson is the Laredo Formation, similar to the Jackson and Yegua, but containing more sand, particularly near its base.

The regional geology dips gently toward the coast and this attitude is reflected in the regional topographic surface; but locally, and at the site, the topography is influenced by streams draining toward the Rio Grande to the south. Elevations, as a result of this influence, range from about 570 feet [msl] on the north end of the site to about 540 feet [msl] on the south. Kier and others (1977) rate the site as naturally suitable for solid waste disposal with proper monitoring.

10.2 General Soils [330.61(j)(1)]

The soils on the site are developed from the underlying geology and active surface processes, primarily related to stream drainage. The USDA's NRCS Soil Map (Sanders, 1985) for the site area describes the soils as generally clay to clay loam and sandy clay loam; this description is confirmed by the site soil borings to date. The soils are generally deep, well developed, saline at shallow depth, and differences leading to designations are largely due to geomorphology. The landscape of the site area consists of broad plains cut by broad valleys. The soils that dominate the site include the Aguilares sandy clay loam, Brundage sandy loam, Catarina clay, and Montell clay. Each of these soils is capable of supporting vegetation suited to ranching.

10.3 Fault Areas [330.61(j)(2) and 330.555]

The site region, dominated by Eocene and older sediments, is not known as an active fault area; active fault causal mechanisms such as heavy groundwater and/or petroleum withdrawal are absent. Area gas wells, while many, are not known to have experienced or generated problems that might be related to faulting. The topographic map and aerial photography do not show linear features characteristic of faulting. There are inactive

faults nearby and at depth as shown on geologic maps and cross-sections; these are more than a mile from the site and not expected to become active. The Wilcox and Vicksburg Fault Zones are generally downdip of the site and are quiescent. The area Geomap (Geomap, 2004) shows two northeast-southwest trending normal faults cutting the Queen City at about -2000 feet [msl], one about 3 miles northwest, and the other about 3 miles southeast of the site, both Wilcox related. A site area cross-section based on geophysical logs interprets a normal fault with fifty feet of normal offset cutting the Carrizo at about -6000 feet [msl]; it is about 2 miles east of the site. Deformation related to the Lower Wilcox Lobo gravity slide is contained within the Lobo Formation (Long, 1985) at a depth of several thousand feet beneath the site. The Pescadito Dome, a deep-seated salt diapir, is located approximately 5 miles west-northwest of the proposed PERC landfill site. It is marked by radial faulting limited to the area of the diapirism. The Moca Salt diapir is located about 28 miles northeast of the proposed landfill site in the northeastern part of Webb County along the boundary with Duval County and it too is marked by radial faulting (Barnes, 1976). The proposed PERC landfill site is located more than two miles from the closest, regionally extensive inactive fault that reaches the surface (Barnes, 1976); this faulting is an upward and inland extension of the Eocene Wilcox Fault Zone. In summary, there are no known active or inactive faults within 200 ft of the proposed landfill site.

10.4 Seismic Impact Zones [330.61(j)(3) and 330.557]

Potential earthquake sources are far away from the PERC site and this distance is reflected in the anticipated low seismic impact risk for the region; that is, the site is in an area of minimal expected peak horizontal acceleration and thus not in a seismic impact zone. The 1931 Valentine Earthquake with a magnitude of 5.8 is perhaps the nearest significant historical event; additional, small events related to hydraulic fracturing are expected as oil and gas exploration continues, particularly with the development of the Eagle Ford shale play. The USGS Seismic Hazard Map(U.S. Geological Survey, 2008) [Figure 10] shows the site location, and contoured values of maximum peak acceleration as a percent of the earth's gravity field, or g, with a 2 percent probability of exceedance in 50 years. The site location between the 2 and 4 percent (g) contours places it well below the threshold for a seismic impact zone. This USGS Seismic Hazard Map is the most current and is widely accepted as the official seismic risk map for this portion of the U.S.

10.5 Unstable Areas [330.61(j)(4) and 330.559]

There appears to be no natural unstable areas, such as karst terrains, landslide areas (the site is essentially flat), subsidence areas, and/or active faults in the area of the PERC site. However, like most landfills located in "good locations", the predominance of subsurface clay materials indicates that the facility location is a potentially "unstable area" due to the properties of the clay materials. At this site, the clays are both expansive and potentially low strength with respect to sliding as a consequence of the clay plasticity ranging from moderate to very high. As demonstrated numerous times at other similar sites, the clay material properties can be readily accommodated in the design and operation of the landfill.

In their present state, the subsurface soils at depth are relatively strong and incompressible due to previous consolidation history over geologic time. No significant differential settling will occur as a result of landfill construction. Proposed excavations, "landfill structural components", and proposed operation/sequencing of landfilling will be designed in recognition of the subsurface materials and conditions. Investigation and geotechnical evaluations are being performed in conjunction with the engineering design of the facility. Stability analyses will be conducted as a normal consideration of facility design with respect to human-induced slope instability. The results of these evaluations will show that engineering measures have been incorporated into the landfill design to ensure that the integrity of the structural components of the landfill will not be disrupted.

Selected references for Section 10.0 include:

Baker, E. (1995). *Stratigraphic Nomenclature and Geologic Sections of the Gulf Coastal Plain of Texas: U.S. Geological Survey Open-File Rept. 94-461.* Reston: U.S. Geological Survey.

Barnes, V. P. (1976). *Laredo Sheet: Geologic Atlas of Texas.* Austin, Texas: University of Texas, Bureau of Economic Geology.

Kier, R. S., L. E. Garner, and L. F. Brown, Jr. 1977. Land Resources of Texas – A map of Texas lands classified according to natural suitability and use considerations. Bureau of Economic Geology, University of Texas at Austin.

Lambert, R. (2004). *Hydrogeology of Webb County, Texas: U.S. Geological Survey Scientific Investigations Report 2004-5022.* Reston: U.S. Geological Survey.

Long, J. (1985). *The Eocene Lobo Gravity Slide, Webb and Zapata Counties, Texas: Contributions to the geology of South Texas.* San Antonio: South Texas Geological Society.

Lonsdale, J. D. (1937). *Geology and Ground-water Resources of Webb County, Texas: USGS Water Supply Paper 778.* Reston: U.S. Geological Survey.

Sanders, R. G. (1985). *Soil Survey of Webb County, Texas.* Washington: U.S. Department of Agriculture, NRCS.

U.S. Geological Survey. (2008). National Seismic Hazard Map: Peak Horizontal Acceleration[%g] 2% probability exceedance in 50 years. Reston: USGS Interactive Mapping.

11.0 GROUNDWATER AND SURFACE WATER [330.61 (k)]

11.1 Groundwater [330.61(k)(1)]

Groundwater conditions at the site are known from a combination of on-site soil boring data and the published literature. Groundwater is localized in sandier sediments encountered, but these sediments, as expected from the nature of the depositional environment, are not necessarily continuous across the site. There appears to be enough ultimate connectivity between water bearing materials, however, to allow this shallow groundwater to approach an equilibrium, or coherent potentiometric surface across the site. Water levels range from about 550 feet [msl] in the north part of the proposed landfill footprint to about 530 feet [msl] in the south--and generally follow the area slope, and consequently the drainage as well.

The near surface sediments at the site are part of the Yegua-Jackson Aquifer, a TWDB designated Minor Aquifer, and named for the geology involved. Parts of this Eocene aquifer, one that serpentines from Webb County and the Mexico border to Louisiana, are productive of freshwater, but that is apparently not the case near the surface at the Pescadito site. Water quality tests on ground water samples from six site borings were analyzed for constituents that include the maximum contaminant levels (MCLs) as established in the national primary drinking water regulations by U.S. EPA. All these ground water samples exceeded the secondary MCLs for total dissolved solids (TDS) and chloride by orders of magnitude. The Yegua-Jackson dips gently toward the coast, is about 1,000 to 1500 feet thick according to a nearby cross-section (Baker, 1995), and is recharged along its outcrop. There are six water wells within about five miles of the site. The geophysical log of the Yugo Ranch well, about 1,575 feet from the site, indicates clays and some sands continuing to its total depth of about 1100 feet [bgs], where it is screened in the lower part of the Yegua. This well, sampled as part of the site study, also showed TDS and chloride values somewhat above the secondary MCLs. The site is a part of this Yegua-Jackson recharge zone and is situated on or near the contact between its elements. However, soil characteristics and groundwater chemistry at the site indicate groundwater recharge in the area is limited.

The Laredo Aquifer underlies the Yegua-Jackson. It too, dips coastward and consists of sands and clays. Its recharge zone that is outcroped, trends in a generally north-south direction, inland of and parallel to the Yegua-Jackson outcrop. This aquifer is an important part of Webb County, for it is capable of producing significant quantities of freshwater, particularly for the sandier lower portion of the Laredo Formation. The Laredo Aquifer provides a portion of Laredo's water supply and has been the subject of Aquifer Storage and Recovery research (Lambert, 2004). The Laredo Formation is about

1,000 feet thick in the area according to the same nearby cross-section (Baker, 1995). It is underlain by the Pico Clay, the ultimate confining unit beneath the site.

Selected references for Section 11.1 include:

Baker, E. (1995). *Stratigraphic Nomenclature and Geologic Sections of the Gulf Coastal Plain of Texas: U.S. Geological Survey Open-File Rept. 94-461.* Reston: U.S. Geological Survey.

Barnes, V. P. (1976). *Laredo Sheet: Geologic Atlas of Texas.* Austin, Texas: University of Texas, Bureau of Economic Geology.

Lambert, R. (2004). *Hydrogeology of Webb County, Texas: U.S. Geological Survey Scientific Investigations Report 2004-5022.* Reston: U.S. Geological Survey.

Long, J. (1985). *The Eocene Lobo Gravity Slide, Webb and Zapata Counties, Texas: Contributions to the geology of South Texas.* San Antonio: South Texas Geological Society.

Lonsdale, J. D. (1937). *Geology and Ground-water Resources of Webb County, Texas: USGS Water Supply Paper 778.* Reston: U.S. Geological Survey.

Sanders, R. G. (1985). *Soil Survey of Webb County, Texas.* Washington: U.S. Department of Agriculture, NRCS.

U.S. Geological Survey. (2008). National Seismic Hazard Map: Peak Horizontal Acceleration[%g] 2% probability exceedance in 50 years. Reston: USGS Interactive Mapping.

11.2 Surface Water [330.61(k)(2)]

There are two large surface water impoundments on the proposed PERC landfill site and several smaller impoundments. For the most part surface water flow occurs as overland flow and flow in dry washes whose course is difficult to identify on available aerial photos. A few of the dry swales on or near the southern end of the proposed PERC landfill site do not have defined bed and banks. This was determined based on onsite inspection by the design engineer who will incorporate appropriate drainage controls into the facility design that comply with all regulations including the Texas Pollution Discharge Elimination System (TPDES) and allow obtaining appropriate TPDES permits.

Currently existing drainage patterns at the proposed permit boundary will not be significantly altered by landfill development and operation. Existing flow volumes, peak discharges, and discharge points will be maintained by the landfill design. The facility will be protected from 100-year frequency flooding to prevent the washout of solid waste. Calculations and analyses will be provided to demonstrate compliance with regulatory requirements concerning surface water drainage.

The proposed facility will operate under TPDES General Permit No. TXR050000. A signed certification to this effect is presented as Attachment H in Part II, and verification that the person who has signed that document is authorized to do so is contained in Section 7.0 of Part I. It will also operate in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will be prepared as the actual design of the landfill and related facilities is completed during the preparation of Parts III and IV of this permit application. The SWPPP will be updated as necessary to reflect site modifications proposed by the operator subsequent to receiving a MSW permit.

The facility will comply with the requirements of the TPDES storm water permitting requirements by continuous operation and monitoring of its SWPPP throughout the active life of the facility. The SWPPP will be developed specifically for the proposed facilities and operations, and will include both ongoing inspection of storm water pollution prevention systems and practices, and periodic sampling and analysis of storm water discharges. Should the results of the SWPPP monitoring indicate a need for revisions, or should the facility and its operation change in the future, the SWPPP will be revised as needed. A Notice of Intent (NOI) to obtain coverage under TPDES General Permit No. TXR050000 (or its successor) will be submitted to TCEQ. Filing the NOI will initiate coverage of this facility under the General Permit and is one of the criteria for compliance with the TPDES and Section 402 of the CWA. Operation of the SWPPP is the other criteria for compliance with the TPDES requirements.

Surface water conditions near the site are very similar to those at the site. Due to the generally flat surface topography and low runoff, combined with the tight, cohesive surficial soils, natural drainage systems exhibit very little erosion. Relatively small artificial dams exist in the area to create "stock tanks" for livestock watering.

12.0 ABANDONED OIL AND WATER WELLS [330.61 (l)]

Abandoned Oil Wells - The area around the proposed landfill site on the Yugo Ranch has been drilled for oil and gas. However, there are no active wells within the proposed landfill footprint or facility site and only one abandoned and plugged gas well. Records of the oil and gas wells were obtained from the Railroad Commission of Texas (RRT). A map of the active and plugged wells was obtained and used as a reference. The approximate location of this plugged and abandoned well can be seen on Plate 4 of Appendix III-E.1 in Part III. See Attachment I in Part II for an owner's affidavit regarding the plugging and abandonment of this well. Gathering lines do crisscross the proposed landfill site; thus, if a waste disposal permit is received, these lines will have to be abandoned and relocated as necessary. Future drilling for mineral resources beneath the landfill will use deviated drilling techniques from surface locations outside the footprint of the proposed landfill.

Abandoned Water Wells – There are no abandoned water wells at the facility.

13.0 FLOODPLAINS AND WETLANDS STATEMENT [330.61 (m)]

Portions of the proposed facility are currently located within the 100-year floodplain, as indicated on the replication of the most current available floodplain map, or Flood Insurance Rate Map (FIRM), presented in Figure 11. An independent comprehensive storm water management system of dikes, drainage channels and detention ponds has been designed to remove areas of the site proposed for the landfill, processing and storage areas and related development from the 100-year floodplain. All the necessary hydrological and hydraulic engineering analysis and results to support the engineering design, along with an application for a Conditional Letter of Map Revision (CLOMR) were submitted to the Webb County Planning Department (WCPD) for review and were approved (see Attachment G). WCPD is the local agency responsible for floodplain management. With concurrence from the WCPD, the CLOMR application was submitted to the Federal Emergency Management Agency (FEMA) for review and approval. The CLOMR, approved on November 21, 2014, verifies that the proposed CLOMR system drainage plans will, in fact, remove areas of the site proposed for the landfill, processing and storage areas and related development from the 100-year floodplain. The design of the proposed landfill and related appurtenances to be provided in Part III of the Application will include a separate, comprehensive storm water management system of dikes, drainage channels and detention ponds.

Any reduction of the permit boundary area will have no effect on the CLOMR application. The CLOMR, as submitted to FEMA, has not changed from that approved by the WCPD and will effectively remove the area of the proposed landfill and buildings from the 100-year floodplain.

Construction of the landfill will impact a named reservoir, Burrito Tank, and possibly several smaller stock tanks. All affected reservoirs are owned by the applicant or by its parent, Rancho Viejo Cattle Company, Ltd. In order to approximate effects of the tanks, storage and discharge relationships were developed and utilized for simulation of the pre-project conditions in the CLOMR analysis. Therefore, all existing features were included in the pre-project conditions analysis. It should be noted that, after reviewing the delineation of the FEMA floodplain with respect to the tanks, the tanks will likely not have any significant attenuation effect on the peak discharge. The 100-year flood is so broad in the vicinity of the tanks it appears there is sufficient area to carry the flows which will bypass the tanks' zones of impact.

The proposed landfill is located in an ideal location considering soil, groundwater, land use, and oil and gas activities (past, present, and future). No other location is equally plausible. It is difficult to find an area of appropriate size in Eastern Webb County that does not have floodplain issues due to the prevailing flat topography and rapid runoff soil

conditions. Applicant endeavored to find an upland location that was reasonably close to the headwater conditions to minimize any impacts to floodplains and/or wetlands.

aci Consulting performed an extensive Jurisdictional Determination at the site and downstream of the site. The U.S. Army Corps of Engineers approved the Jurisdictional Determination and the U.S. Environmental Protection Agency concurred that the site contains only "intra-state, isolated, non-navigable waters" under 33 CFR 328.3 (a)(3). Correspondence was subsequently received from the U.S. Army Corps of Engineers stating that this project will not involve activities subject to the requirements of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 and that no permit was necessary to comply with Section 404 or Section 10 as there are no Waters of the United States at the site. See Part II, Attachment A for a copy of the approved Jurisdictional Determination and correspondence from the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency.

14.0 ENDANGERED OR THREATENED SPECIES [330.61 (n)]

A site reconnaissance and evaluation was performed by TRC in 2009 to assess the potential for the facility to harbor endangered and threatened species, or to provide critical habitat for such species. This evaluation included obtaining current lists of both federal- and state-listed species for Webb County and identifying the habitat and range or occurrence characteristics of all such listed species.

Based on the results of their evaluation, TRC concluded that the site of the proposed facility may contain habitat or range conditions that may result in the occurrence of endangered or threatened species. By comparing the characteristics of the site to surrounding areas, it was clear that habitat and environmental conditions of the site are not significantly different from conditions for many miles surrounding the site. No unique or critical habitat conditions were observed. A biological evaluation was completed and provided to TPWD and USFWS. TPWD has responded and a copy of its response letter is contained in Attachment A.

Subsequent to TRC's studies, aci Consulting performed an extensive Biological Assessment and received notice from the U.S. Fish and Wildlife Service that the proposed project had complied with section 7(a)(2) of the Endangered Species Act, and concurred that the project would have no effect on four of the species identified (ocelot, interior least tern, ashy dogweed and Johnston's frankenia) and would not adversely affect the jaguarundi due to its closest observation being 44 miles to the north and the proposed conservation measures that will benefit the species should they be in the vicinity of the project site. See Part II, Attachment A for a copy of the Biological Assessment and correspondence from the USFWS.

15.0 TEXAS HISTORICAL COMMISSION REVIEW [330.61 (o)]

The Texas Historical Commission (THC) was asked to review the proposed project in the context of the Natural Resources Code, Chapter 191, and Texas Administrative Code. THC notified TRC that the proposed project may proceed (see Attachment C). Additionally, TRC searched on-line data sources and found that the project does not appear to affect any known cultural resources sites or historic properties (see Attachment D).

16.0 COUNCIL OF GOVERNMENTS AND LOCAL GOVERNMENT REVIEW [330.61 (p)]

Part I and Part II of this permit application were submitted to the South Texas Development Council (STDC) for review for compliance with the regional solid waste plan. TRC completed the STDC *Checklist for Review* to describe the proposed PERC facility and discussed ways this facility will conform to the regional plan. STDC has determined the proposed facility conforms to the regional plan, and is compatible with land use in the area (see Part II, Attachment E).

Also, information letters about the proposed project were submitted to Webb County and the City of Laredo, and review letters are being requested from each entity regarding compliance with any local solid waste plans for their jurisdictions (see Part II, Attachment E).

Information about the Pescadito Environmental Resource Center was presented to Webb County Commissioners Court. The Webb County Judge and all four County Commissioners expressed support for the project. A copy of a letter from Webb County Judge Danny Valdez affirms the support of Webb County (see Part II, Attachment E).

17.0 AIR POLLUTION CONTROL [330.371]

The proposed landfill will have a design capacity greater than 2.5 million megagrams (2.76 million tons) and 2.5 million cubic meters (3.27 million cubic yards). Air emissions from the landfill facility will be controlled, to the extent necessary, to qualify for a standard permit.

The owner/operator of the landfill facility will submit a certification for the initial construction of the landfill at least 120 days prior to building or installation of any equipment or structure that may emit air contaminants. The certification will be based on the capacity of the landfill for a minimum ten-year period. The certification will include supporting documentation to demonstrate compliance with TCEQ air permitting requirements and any other applicable federal and state requirements and at a minimum will include the following:

(1) The basis and quantification of emission estimates;

(2) Sufficient information to demonstrate that the facility will comply with all applicable TCEQ air permitting requirements; and

(3) A description of any equipment and related processes.

18.0 GENERAL OPERATIONAL CONSIDERATIONS [330.15]

The PERC landfill facility will not operate in violation of the Texas Health and Safety Code, or any regulations, rules, permit, license, order of the commission, or in such a manner that causes:

(1) The discharge or imminent threat of discharge of MSW into or adjacent to the waters in the state without obtaining specific authorization for the discharge from the commission;

(2) The creation and maintenance of a nuisance; or

(3) The endangerment of the human health and welfare or the environment.

The open burning of solid waste, except for the infrequent burning of waste generated by land-clearing operations, agricultural waste, silvicultural waste, diseased trees, emergency cleanup operations as authorized by the commission or executive director as appropriate, is prohibited. The operation of an air curtain incinerator other than for the exceptions noted above is prohibited.

The following wastes will not be accepted for disposal at this facility:

(1) Lead acid storage batteries;

(2) Do-it-yourself used motor vehicle oil;

(3) Used oil filters from internal combustion engines;

(4) Whole used or scrap tires, unless processed prior to disposal in a manner acceptable to the executive director;

(5) Refrigerators, freezers, air conditioners, and any other items containing chlorinated fluorocarbon (CFC);

(6) Liquid waste, except as allowed in 30 TAC §330.177 (relating to Leachate and Gas Condensate Recirculation), and/or except household liquid waste as allowed by30 TAC §330.15(e)(6) will not be accepted for disposal in any MSW landfill unit;

(7) Regulated hazardous waste as defined in 30 TAC §330.3;

(8) Polychlorinated biphenyls (PCB) wastes, as defined under 40 Code of Federal Regulations Part 761, unless authorized by the United States Environmental Protection Agency and the MSW permit; and

(9) Radioactive materials as defined in 30 TAC Chapter 336 (relating to Radioactive Substance Rules), except as authorized in Chapter 336 or that are subject to an exemption of the Department of State Health Services.

The facility will receive sewage sludge only in compliance with commission requirements and the requirements of the Federal Clean Water Act, §309 and §405(e).

The drilling of any test borings, for any reason, through previously deposited waste or cover material without prior written authorization from the executive director is prohibited.

The facility will neither be designed nor operated to cause:

(1) A discharge of solid wastes or pollutants adjacent to or into waters of the state, including wetlands, that is in violation of the requirements of Texas Water Code, §26.121;

(2) A discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Federal Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System requirements, under §402, as amended, or Texas Pollutant Discharge Elimination System requirements;

(3) A discharge of dredged or fill material to waters of the United States, including wetlands, that is in violation of the requirements under Federal Clean Water Act, §404, as amended; and

(4) A discharge of a nonpoint source pollution into waters of the United States, including wetlands, that violates any requirement of an area-wide or state-wide water quality management plan that has been approved under Federal Clean Water Act, §208 or §319, as amended."