SB 610 WATER ASSESSMENT FOR CHEVRON SAN LUIS OBISPO TANK FARM PROJECT

RRM Design Group

San Luis Obispo, California

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Modified from December 2011 report
(Included Well #4 in the project water wells (Table 6) and deleted a portion of the paragraph following Table 6)

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EXECUTIVE SUMMARY

The Chevron San Luis Obispo Tank Farm Remediation and Development project is proposed as a County of San Luis Obispo permitted project. The development includes 803,000 square feet of commercial and industrial buildings with a buildout water demand of 119.7 acre-feet per year. The on-site wells would produce 58.1 acre-feet per year of water and the remaining water supply would be obtained from recycled water. The on-site wells would also be used to provide water for the remediation portion of the project. The total water supplies available during normal, single-dry and multiple-dry water years within a 20-year projection are sufficient to meet the projected water demand for the project in addition to the demand of existing and other planned future uses. The on-site wells produce water from the San Luis area of the San Luis Obispo Valley groundwater basin. The basin has not been defined to be in overdraft and has not been adjudicated.

A. PROJECT DESCRIPTION

The project has been defined by Chevron's consultant, RRM Design Group, for the environmental impact studies. The project is referred to as a remediation and development project. For purposes of this SB 610 analysis, water uses for the remediation (and restoration) portion of the project are separated from the development project and are considered as groundwater uses that are planned to occur before and during the first phase of the development.

The remedial work is to remove or contain and monitor petroleum contamination in the soil and water and restore the land and vegetation. As a part of the remediation plan, various approaches are proposed to mitigate the potential impacts of the identified contamination to protect human health and environment. All of these approaches incorporate institutional controls to restrict where groundwater development can occur to areas outside of known soil contamination and, in the case of the former NW Operations Area, this control extends to areas immediately downgradient (identified on Figure 1). This restriction is taken into consideration with respect to the locations of domestic water supply wells.

Avocet Environmental, Inc. prepared a Technical Memorandum evaluating the potential for petroleum impacted soil at the former tank farm to adversely affect water quality in supply wells installed outside of petroleum-impacted areas. This evaluation, which considered the physicochemical properties of the petroleum, the site hydrogeology, and more than 20 years of groundwater monitoring data, concluded that:

> "the potential for direct impacts to water supply wells due to migration of separate- or dissolved-phase petroleum is negligible. However, biodegradation of the petroleum is producing polar nonhydrocarbons that may be detected in downgradient wells at low concentrations. These types of dissolved organic compounds are prevalent in the groundwater of aquifers containing decomposing vegetation, which are common throughout the world. The reported low toxicity and taste and odor properties of these compounds, relative to the parent petroleum, suggest that the potential presence of these polar nonhydrocarbons will not limit utilization of the groundwater resource for the proposed project. If future analyses reveal these compounds to be present in water supply wells at unacceptable levels, reliable and cost-effective treatment methods are available for their removal"

The remediation of the tank farm property is planned to be started three years prior to beginning the first phase of the development and is planned to be completed midway through the first phase of the development. The use of on-site project wells to produce the water required for the remediation will be assumed to occur. Therefore, groundwater production from these wells will not only provide for development demands but also the remediation demands for the first couple of years of the development. The remediation demands are non-potable and will be for dust control, plant nursery and initial irrigation of newly planted native plants.

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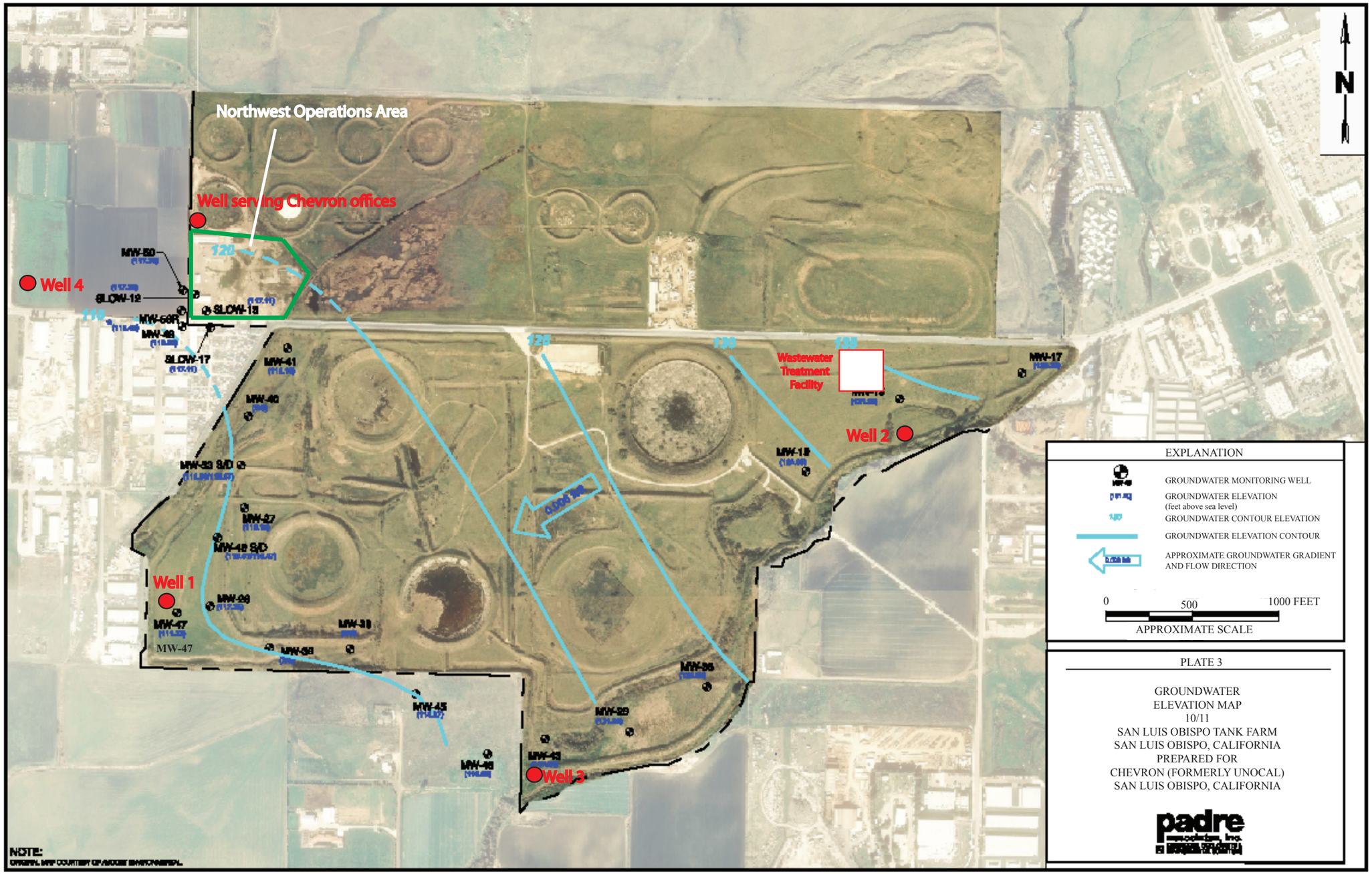


Source: Padre Associates, Inc., modified to enhance scanned image and include project water wells and project wastewater facility and creek discharge

Project water well

Figure 1
Well Locations
Groundwater Level Elevation Contours
Chevron San Luis Obispo Tank Farm Property

Chevron's goal is to develop approximately 17 percent of the Project Site with approximately 800,000 square feet (floor area) of business park and service commercial uses. Developments would be implemented in five phases over a period of approximately 25 years; each phase would create approximately 160,000 square feet of leasable floor area and take approximately five years to construct.

B. REGULATORY APPROVALS FOR IMPLEMENTATION

The water facilities would be managed and operated by a water company dedicated to this project area. At this time, the water company has not been established. The water and wastewater infrastructure and formation of the water company is proposed to be included in the project. The County of San Luis Obispo General Plan and the City of San Luis Obispo Airport Area Specific Plan (2005) are the existing documents that provide the guidelines for development of the project and its infrastructure. An amendment to the specific plan is in process to update the plan and to include the changes made to the specific plan for the proposed project. The specific plan process involves input from regulatory agencies for implementation.

The proposed water/wastewater systems would require approvals by the County of San Luis Obispo Department of Health Services Environmental Health Division, County of San Luis Obispo Planning Department, the California Department of Health Services, the California Regional Water Quality Control Board, the California Department of Fish and Game, the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the California Air Resources Board. The project is progressing through California Environmental Quality Act (CEQA) review that will further define the necessary permits and approvals for the proposed project and its water/wastewater components.

C. WATER SUPPLY

Wells pumping groundwater from the San Luis Obispo Valley groundwater basin would provide water for the proposed project. According to Chevron, the project remedial measures will include restrictions to groundwater production in proximity to the contamination but no restrictions will be imposed on the pumpage of groundwater from the proposed well field areas for project water supply.

Wastewater reuse is a significant component of this water supply, offsetting more than half of the project water demand. This SB 610 water assessment evaluates the reliability of the originating source of water (the groundwater) to provide sufficient water to the project with a portion of the water being recycled.

Project Gross Water Demands

Project gross water demand has been estimated by RRM Design Group. Gross water demands are summarized in Table 1.

Table 1
Gross Water Demands at Buildout

Type	Floor Area (square feet)	Water Use Factor (per 1,000 square feet)	Water Use (acre feet/ year)
Light Manufacturing	170,000	0.071	12.1
Industrial Research and Development	50,000	0.1	5.0
Business Park (Offices)	348,000	0.066	23.0
General Retail	15,000	0.008	0.1
Vehicle Services Repair and Maintenance – Major	20,000	0.03	0.6
Veterinary Clinic/Hospital, Boarding, Large Animals	5,000	0.2	1.0
Photo and Film Processing Lab	10,000	0.071	0.7
Printing and Publishing	10,000	0.071	0.7
Warehousing, Indoor Storage	50,000	0.029	1.5
Wholesaling and Distribution	50,000	0.029	1.5
Hotel (115 room)	70,000	0.43	49.5
Specialized Education /Training Facility	5,000	0.066	0.3
Water Treatment Facility (4 acres)	--	1.4 per acre	2.8
Recreational Fields (15 acres)	--	1.4 per acre	21
Total	**803,000**		**119.7**

Source: RRM Design Group

Project Water/Wastewater Facilities

The County Development Option would include on-site wells and a wastewater facilities to provide water and sewer service to the development. The existing and proposed locations of these facilities are shown on Figure 1.

Water treatment, storage and distribution facilities have yet to be designed and constructed. For purposes of this assessment, these facilities are conceptually designed by RRM Design group. There are three existing water wells that are being proposed to supply the project: Wells 1, 2, and 3. These wells have been constructed and tested. Water quality results indicate that the water is suitable for domestic water use purposes. Currently, one well is being used for livestock water and the others are not equipped. One other water well on the property is being used for the tank farm offices but is not planned for use by the proposed development.

The existing water lines that have been used for the tank farm facility include those used for domestic purposes and those that are a part of the fire suppression system. The water pipelines for the proposed development would be a new system that is designed specifically for the project and would include a dual pipe system to allow for delivery of groundwater and recycled water.

Water storage facilities will include separate storage for the recycled water of 100,000 gallons and pumped groundwater of 1,000,000 gallons.

Wastewater would be treated at a centralized treatment facility, resulting in effluent that meets water quality requirements for use as a non-potable water supply (referred to as "recycled" water). This recycled water would be used for irrigation and toilet uses (more than 50 percent of the water demand).

A portion of the recycled water during the rainy season must be stored and discharged. Short term storage of the product water from the treatment facility would be in ponds with the overflow being discharged to a polishing wetland north of Tank Farm Road. The maximum monthly amount of discharge to the nearby creek (Acacia Creek) during a wet year at build-out amounts to 2.1 acre-feet. This wet year maximum month discharge is equivalent to an average rate of about 15 gallons per minute.

The gross water demand for the proposed development is met with pumped groundwater and recycled water. The amount of groundwater pumpage will vary depending on seasonal demand fluctuations and instantaneous demand fluctuations that are balanced by the amount of water stored in the water supply water tanks. Groundwater pumping rates for average and peak conditions are shown in Table 2.

Table 2
Design Water Supply Requirements

Unit	Gross Demand	Recycled Water	Groundwater Pumpage	Groundwater Peak Month	Groundwater Peak Flow
Acre-feet per year	119.7	61.6	58.1		--
Average Daily Demand, gallons	106,900	55,000	51,900	88,000	---
Gallons per minute	74	38	36	61	153

Source: RRM Design Group

D. SB 610 REQUIREMENTS FOR GROUNDWATER SUPPLY SOURCES

Senate Bill 610 incorporated specific requirements for a water assessment that addresses projects utilizing groundwater as a source. The information required for a groundwater supply is defined within the California Water Code section 10910, subdivision (f):

California Water Code section 10910, subdivision (f)
(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by

paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

D.1. REVIEW OF URBAN WATER MANAGEMENT PLAN

In accordance with the requirements for a Water Supply Assessment, the City of San Luis Obispo Urban Water Management Plan that covers the area of the project is discussed below.

The City of San Luis Obispo (City) has published its 2010 Urban Water Management Plan (UWMP) in 2011 that includes the project area within its boundaries, as a part of the City's sphere of influence. The UWMP discusses the groundwater basin and the City's pumpage from the basin and the City's future plans for groundwater use. The UWMP has been reviewed and relevant information is included within this assessment. The UWMP states that groundwater production is about 2 percent of the total water supply for the City and is planned to remain at that level for the next 25 years. "The City will continue to utilize limited amounts of groundwater in the future when the resource is available and the water quality is appropriate for potable purposes."

"Consistent with Policy A 3.2.3 from the City's 2010 Water and Wastewater Management Element of the General Plan….the City will no longer rely on groundwater for long-term community water demands because of water quality and reliability issues. The City will continue to use groundwater for domestic purposes when available, but will not consider this source of supply as part of its water resource planning."

There is no discussion in the City UWMP related to the use of on-site groundwater for the San Luis Obispo Tank Farm project. The 2005 Airport Area Specific Plan prepared by the City of San Luis Obispo, on which the UWMP is based, states: "If City water supplies are not supplemented in time to serve maximum buildout of a property in the Airport Area, on-site water supplies may be used. If on-site supplies are not sufficient to serve the maximum development of a property otherwise possible, the property should be developed to allow for subsequent buildout of the property when additional City supplies become available."

The City has sufficient water for the proposed project but no formal agreement between the City and Chevron has been reached for the City to serve the development. Without this agreement, City water would not be available to the project. Therefore, the proposed County-based project would use on-site water supply. According to the UWMP, the City's groundwater use is not a part of its long term water supply plans. Therefore, no impact would result from the City's limited groundwater use on the project wells and no impact would result from the project's groundwater use on the City's wells.

D.2. DESCRIPTION OF GROUNDWATER SOURCE: SAN LUIS AREA OF SAN LUIS OBISPO VALLEY GROUNDWATER BASIN

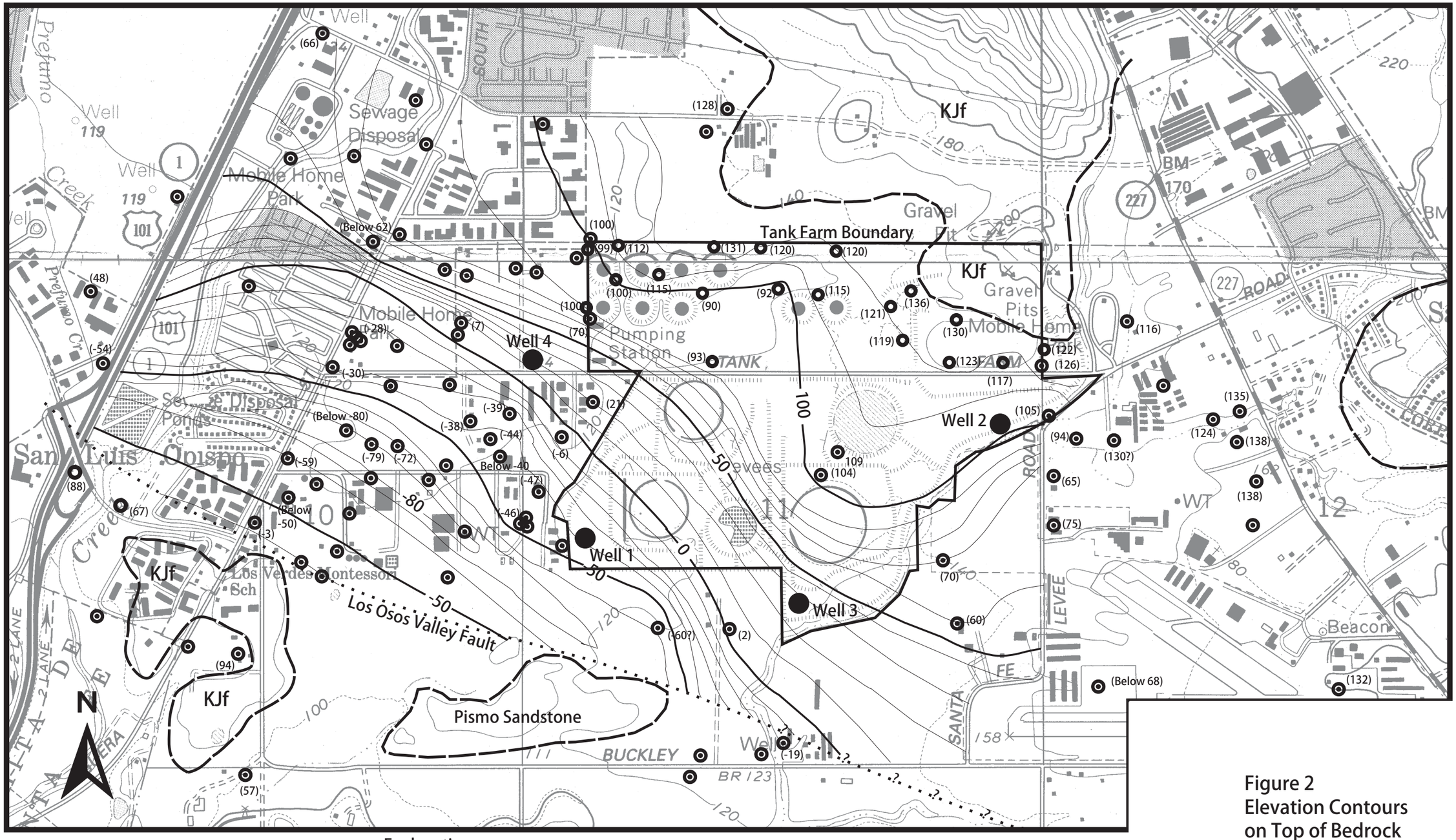
The water source for the project is the San Luis Obispo area of the San Luis Obispo Valley groundwater basin. This basin, as described in the California Department of Water Resources (DWR) Bulletin 118 report (published 2/27/2004), includes two areas separated by a groundwater divide- the San Luis Obispo Creek valley (San Luis) area and the Pismo Creek valley (Edna) area. The proposed project is in the San Luis area. These basin areas have distinct groundwater recharge and production characteristics and are considered sub-basins in the draft San Luis Obispo County Master Water Plan (August 2011 draft). In order to assess the groundwater resources most directly related to the project, the available yield and water level trends within the San Luis area are considered.

The San Luis portion of the San Luis Obispo Valley groundwater basin is comprised of shallow alluvial sediments and deeper marine sedimentary beds that have been deposited in the San Luis Obispo Creek valley. The basin area has formed as a result of tectonic activity that has uplifted the Irish Hills and down-dropped the valley floor. As a result, the basin sediments increase in thickness toward the southwest where the deeper deposits butt against the Los Osos Valley fault. The more recent alluvial sediments derived from stream transport appear to be deposited over the fault alignment and form an alluvial valley along San Luis Obispo Creek to the ocean.

The groundwater basin in the vicinity of the project area has been characterized in the Cleath & Associates letter report, "Hydrogeologic Studies of San Luis Obispo Tank Farm Property, San Luis Obispo, California" dated June 5, 2002. The base of the permeable sediments/top of bedrock contour map from this report has been modified to show the current boundary for the property and the project well locations and is shown on Figure 2.

The most recent estimates of groundwater in storage and average annual recharge were made by DWR in 1997. Groundwater in storage within the San Luis area was estimated at 16,300 acre-feet. Average annual recharge to the San Luis area was estimated at 2,200 acre-feet per year. Recharge varies depending on available storage for recharge waters. During periods where groundwater levels are low, more recharge can occur. Recharge is comprised of percolation of rainfall, percolation of streamflow, and irrigation returnflows and wastewater discharge percolation. The City of San Luis Obispo discharges their wastewater to San Luis Obispo Creek near the downstream edge of the main groundwater basin area and would also be a recharge source.

Groundwater levels have been monitored in the vicinity of the project wells for over 50 years and at the project site for more than 10 years. The project area groundwater contour map (Figure 1) and the groundwater level hydrograph (Figure 3) illustrate groundwater conditions. The groundwater contour map shows that the groundwater surface slopes to the southwest toward the



Base Map: USGS Topographic 7.5 Minute Series, San Luis Obispo and Pismo Beach Quadrangles, San Luis Obispo County

Scale: 1″ = 1000′

Explanation

- Well
- Boring
- 50 — Contours on top of bedrock, elevations in feet above mean sea level.
- (-30) Elevation of top of bedrock in boring or well in feet.
- KJf Franciscan Formation

Figure 2
Elevation Contours on Top of Bedrock

Cleath-Harris Geologists

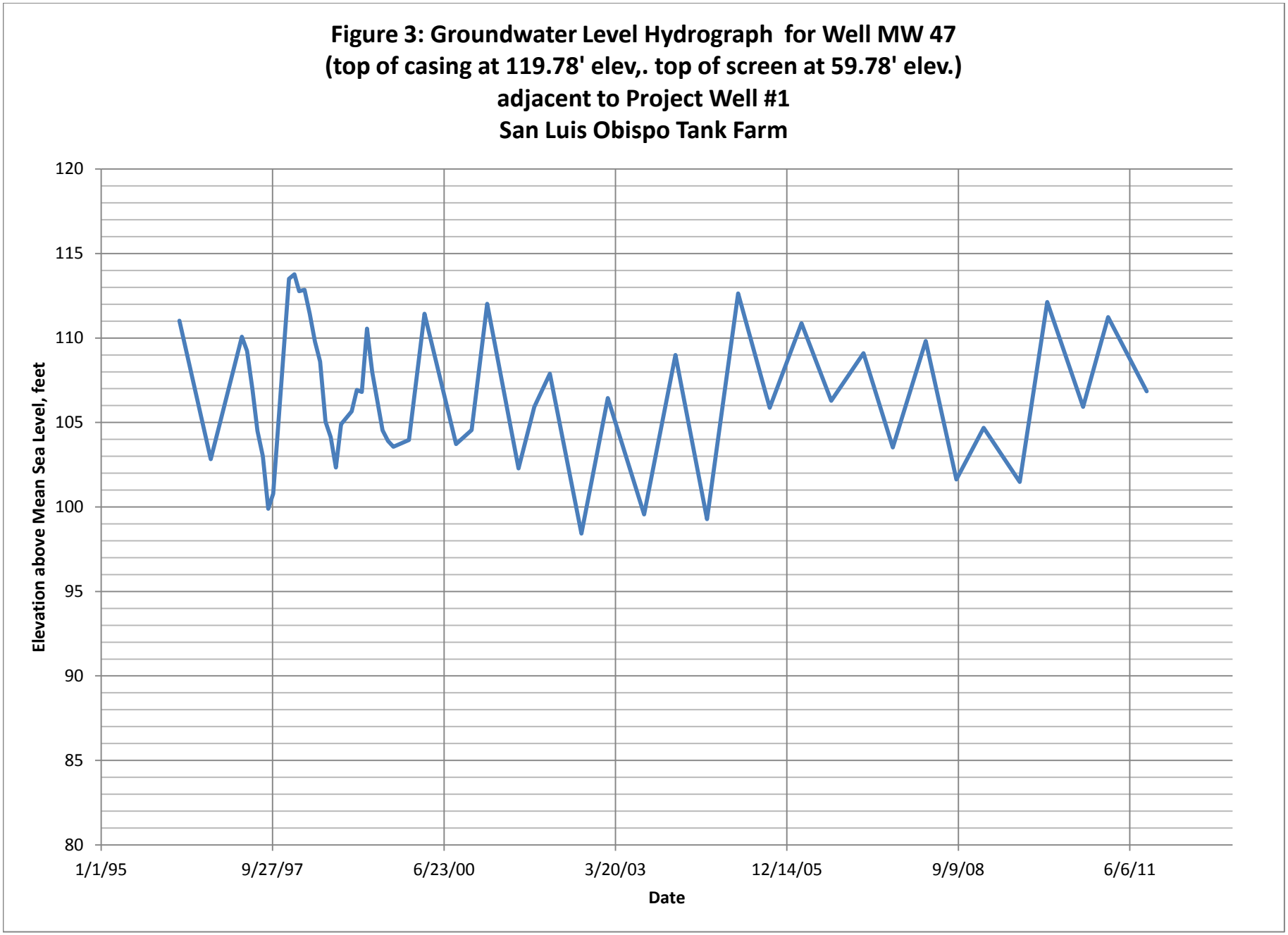


Figure 3: Groundwater Level Hydrograph for Well MW 47
(top of casing at 119.78' elev,. top of screen at 59.78' elev.)
adjacent to Project Well #1
San Luis Obispo Tank Farm
Elevation above Mean Sea Level, feet
120
115
110
105
100
95
90
85
80
1/1/95
9/27/97
6/23/00
3/20/03
12/14/05
9/9/08
6/6/11
Date

area where Well #1 is located. The hydrograph level for a well in the southwestern portion of the tank farm area has shown annual fluctuations of about 15 feet. This range of fluctuation is normal and does not cause wells to go dry. The most recent groundwater level (September 2011) is four feet higher than the level measured in October 1996. The trend of groundwater levels has been essentially flat over the past 15 years.

Groundwater Yield of San Luis area of San Luis Obispo Valley Groundwater Basin

The UWMP states the following regarding the groundwater basin condition:

> *"The majority of groundwater use from the San Luis Obispo Groundwater Basin is used for agricultural purposes and private property uses. <u>The basin has not been defined to be in overdraft and has not been adjudicated</u>. According to DWR's Bulletin 118, the basin is relatively small and recharges very quickly following normal rainfall years. Because of these factors, no groundwater management plan has been prepared for the basin."*

The DWR did not identify this basin as being in overdraft in the last comprehensive assessment of groundwater basins in California in 1980 (Bulletin 118-80). In this same document, there is no projection that the basin would be overdrafted if the existing management conditions at that time were to continue. The draft 2011 San Luis Obispo county Master Water Plan does not identify the San Luis Sub-Basin as being in overdraft or projected overdraft.

Current groundwater dynamics in the San Luis area are different than in 1980 with less pumpage and greater recharge. The San Luis portion of the basin is not currently in overdraft as is evidenced by the recent stable water levels. Groundwater production has been declining in this basin area over the past 20 years due to the increasing urbanization of the area as discussed below.

D.3.a. GROUNDWATER PRODUCTION- SAN LUIS AREA

Groundwater from the San Luis area of the San Luis Obispo Valley Groundwater Basin is being used primarily for agricultural irrigation purposes. The City of San Luis Obispo has several wells in the area and there are many private domestic wells in the Tank Farm Road area.

<u>Agricultural Irrigation</u>

As the City has expanded services into the South Higuera to Broad Street area, land uses have changed from irrigated agriculture to urban uses with City provided services. As a result, the water supply for the San Luis area uses less of the local groundwater resources. DWR has estimated that annual groundwater extractions for agriculture in this area declined from about 2000 acre-feet in the late 1970's to 1000 acre-feet in the mid-1990's. From 1990 to 2003, the

agricultural acreage declined by about 50 acres to a total of 190 acres. The groundwater pumpage in 2003 was estimated at 390 acre-feet. Since that time, the acreage of agriculture has further declined with the conversion of the Avila parcel along Vachell Lane to a commerce park and the conversion of the Meissner parcel along Tank Farm Road to commercial buildings with corresponding reductions in groundwater extractions.

Current agricultural properties include several properties along Buckley Road. Agricultural water use in the San Luis area of the groundwater basin east of San Luis Obispo Creek is estimated to be about 230 acre-feet per year.

West of San Luis Obispo Creek, the Dalidio and McBride parcels are in cultivation. The Dalidio Ranch/McBride parcels have been irrigated at a rate of 500 acre-feet per year. There are plans to convert these lands to urban uses. Further west (west of the City limits), there are groundwater-irrigated agricultural fields that will remain in cultivation but are very unlikely to impact groundwater near the project site because most of this groundwater is produced from fractured rock zones adjacent to the groundwater basin.

Domestic Production

The City's groundwater extractions began in the late 1980's, peaked at about 2000 acre-feet in 1990 and declined to about 100-150 acre-feet per year (AFY) in the mid-1990's and has remained at about the same amount since that time. The City wells that produce water from the basin include one well on Prado Road for construction water, one well near Los Osos Valley Road and Froom Ranch Road, and one well at the City's Laguna Lake Golf Course. None of these wells are likely to be impacted by, or impact the proposed project water wells.

Within the watershed of the Eastern Fork of San Luis Obispo Creek, there are a few small water systems served by groundwater. These systems include Fiero Lane Mutual Water Company and Hidden Hills Mobilodge, and Higuera Apartments. Some of the commercial/industrial properties along Tank Farm Road, Broad Street, Buckley/Vachell Roads and Suburban Road also have County monitored non-transient non-community water systems. These include Tank Farm Business Park, Holdgrafer & Associates, Tank Farm Industrial Plaza, Whitson Industrial Park, Strassbaugh Water Company, Noll Properties, Williams Water, San Luis Business Park, Paragon Triangle Water Supply, Copelands, Ernie Ball, 141 Suburban Road Water Supply, 200 Suburban Road Water Supply, Wallace Water Systems, and Dioptics. In addition to these public/shared water systems, there is a rural residential area south of Buckley Road served by on-site or shared water wells. These same properties have on-site wastewater disposal also. Groundwater production for the properties south of Buckley Road and east of Broad Street are mostly from low production rate wells producing from lower permeability strata that are outside of the groundwater basin. The wells serving the residential and commercial/industrial properties along Suburban and Tank Farm Roads do produce from the groundwater basin but there is typically low demand to be supplied from these wells. Further from the tank farm property, on the west

side of the City of San Luis Obispo, there are two small water companies that use shallow basin wells. These western systems serve a total of less than 100 people. Overall water production from the basin for these rural residential, commercial/ industrial and small community systems is estimated to be less than 100 acre-feet per year.

Based on the documented figures for groundwater extractions, current total groundwater extractions in the San Luis area are estimated to be in the range of 1000-1200 AFY. Groundwater extractions are significantly less than the safe yield for the basin area, whether it be the DWR estimate of 2000 AFY (Bulletin 18, 1958), the DWR estimate of 2000-2500 AFY (unpublished findings, 1997) or the Boyle Engineering (1991) estimate of 3650 AFY for average annual recharge to the basin.

D.3.b. GROUNDWATER PRODUCTION - SAN LUIS OBISPO TANK FARM

Groundwater pumpage at the site of the proposed project, the San Luis Obispo Tank Farm, has been used for domestic purposes at offices on the property and stock grazing. The pumpage is taken from a well located adjacent to the existing office buildings. This well is not included in the facilities for the proposed project. Under the proposed project, the new water system would provide water to new commercial buildings at the site of these facilities.

The tank farm offices use a 140-foot deep well to provide non-potable water to the office buildings. In 1986, 35 employees were reported to work at this facility. These personnel have been provided bottled water for drinking water purposes prior to, and since that time. The well water is used for the remaining domestic purposes. Minimal landscaping exists on the property. Using the City's water use rate for offices of 0.066 AFY per 1,000 square feet and an estimated building area of 15,000 square feet, the annual water use would be 1 acre-foot per year. 50 head of cattle graze the tank farm land. Assuming that each cow requires 12 gallons per day, 600 gallons per day (0.67 AFY) of water is produced from the well for stock watering. Allowing for some additional water use on the property related to industrial activities, groundwater extractions are estimated at 2 AFY.

The pumpage for each of the past five years is estimated to be approximately 2 AFY serving the Chevron tank farm office buildings and livestock activities (Table 3). The pumpage from the City and Chevron wells are only a very minor part of the Total Extractions.

Table 3
Groundwater Pumpage at Property and by City of San Luis Obispo
San Luis Obispo Groundwater Basin

Year	2006	2007	2008	2009	2010
City*	133	133	101	87	132
Chevron	2	2	2	2	2

*City pumpage source: 2010 Urban Water Management Plan

D.4. PROPOSED PROJECT WATER EXTRACTIONS FROM SAN LUIS AREA GROUNDWATER

Under the proposed County based project and in accordance with the City Airport Area Specific Plan policy, groundwater from on-site wells will remain as the supply source for water supply on the Chevron Tank Farm property. The wastewater generated by the project will be treated and recycled for non-potable purposes. The recycled water is derived from the produced groundwater.

Remediation

Remedial work will be started but not yet completed, prior to the proposed development, at the Tank Farm property. The requirements for groundwater extraction during the remedial work would be for potable/non-potable domestic uses, dust control, and potentially dewatering of excavated areas. The amount used for the remediation and restoration activities would vary over five years. The remediation will use water for dust control and compaction moisture for the first three years. The restoration work will use water for nursery irrigation for seven years and the initial watering of newly planted vegetation for the second through fourth years. Avocet Environmental has prepared a water demand table for these uses (Table 4):

Table 4
Water Demand
Remediation and Restoration
Chevron San Luis Obispo Tank Farm
(acre-feet per year)

Work	Use	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Remediation	**Dust Control**	25	25	25	0	0	0	0	0
	Compaction Moisture	25	25	25	0	0	0	0	0
Restoration	**Nursery**	21	40	63	64	19	6	2	0
	Plantings		35	35	35	0	0	0	0
Total		71	125	148	99	19	6	2	0

Source: Avocet Environmental, October 28, 2011/modified for dust control by RRM Design Group

Development

The amount of groundwater extractions that will be required for the proposed project will increase as the project phases are built out. Once the project has reached build-out, the long term water demands would stabilize at those values estimated in the demand tables. The groundwater production requirement for each phase of development is estimated in the following paragraphs and summarized in Table 5.

A brief description of the development by phase is listed below. Each of the five phases proposes approximately 160,000 square feet of development. Descriptions below include features unique to each phase, the Gross water demand (recycled and pumped groundwater) of that phase and the cumulative Net water demand (pumped groundwater) for the project.

Phase 1 will involve the wastewater plant and the western industrial development and eastern Lot 4 commercial services development. The gross water demand for Phase 1 is roughly 15 acre-feet per year. Net groundwater production would meet about half of this demand- at 7 acre-feet per year.

Phase 2 will include additional industrial and commercial development along with the hotel and recreational fields. The gross water demand for Phase 2 is roughly 72 acre-feet per year. Net groundwater would meet half of this demand- at 36 acre-feet per year. Adding Phase 2 to Phase 1, the cumulative net groundwater production would be 43 acre-feet per year.

Phase 3 will include further development of commercial service and industrial zoned lands. The gross demand for Phase 3 would be 13 acre-feet per year. Net groundwater production would meet slightly less than half of this demand- 6 acre-feet per year. Adding Phase 3 to Phase 1 and 2, the cumulative net groundwater production would be 49 acre-feet per year.

Phase 4 is entirely industrial. The gross water demand for Phase 4 would be 9 acre-feet per year. Net groundwater production would meet slightly less than half of this demand: 4 acre-feet per year. Adding Phase 4 to Phases 1, 2, and 3, the total groundwater production would be 53 acre-feet per year.

Phase 5 is entirely commercial service: 200,000 square feet. The gross water demand for Phase 5 would be about 12 acre-feet per year. Net groundwater production would meet slightly less than half of this demand- at 5 acre-feet per year. Adding Phase 5 to Phases 1-4, the cumulative net groundwater production would be 58 acre-feet per year. 58 acre-feet per year is the amount of total groundwater production estimated by RRM in the buildout water demand calculations.

Table 5
Projected Groundwater Extractions
San Luis Obispo Tank Farm Remediation and Development Project
San Luis Obispo Groundwater Basin

Date		**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Years from Start of Remediation		**-2**	**4**	**9**	**14**	**19**	**24**
Remediation and Restoration		0	99	0	0	0	0
Development Construction		0	7 (27)**	7 (27)	7 (27)	7 (27)	7 (27)
Development	**Current**	2					
	Phase 1 (2012-2016)		7				
	Phase 2 (2017-2021)			43			
	Phase 3 (2022-2026)				49		
	Phase 4 (2027-2031)					53	
	Phase 5 (2032-2036)						58
Total Extractions		2	113 (140)***	50 (77)	56 (83)	60 (87)	65 (92)

*2012 is year 1 for Remediation and Restoration and 2015 is year 1 for Development
** 27 acre-feet additional demand occurs in a single year for each Phase per Avocet Environmental
*** includes additional single year demand for infrastructure construction, assuming the infrastructure work estimated in the development construction is performed during this year of each phase)

Yield of Project Groundwater Supply Facilities

The groundwater supply facilities proposed for the project that currently exist are four water wells. A fifth well, located west of the Chevron offices is not included because of the potential for restriction of use due to the remedial action plan. The four water wells have been tested for yield and for water quality. The well information is summarized in the Cleath & Associates report, "Well Construction and Testing, Ground Water Exploration, San Luis Obispo Tank Farm Property, San Luis Obispo, California" dated September 30, 2002.

The reliable long term yield for each of these wells has been estimated by Cleath & Associates in 2003 based on pumping test information, aquifer characteristics and historic groundwater level fluctuations (including drought years) and interference factors. These estimates remain valid in light of current groundwater conditions and are presented in Table 6.

Table 6
Long-Term Yield and Source Capacity
Existing Project Water Supply Wells

Well	Long-Term Yield (afy)	Source Capacity (gpm)	Average use (hours per day)
Well 1	113	140	12
Well 2	8	30	4
Well 3	13	20	10
Well 4	19	40	7
Total	153	230	

Source: Cleath & Associates, January 10, 2003

Based on these long-term yield calculations, the wells would be able to produce more water than what is estimated for groundwater production in the water demand calculation of the development project with the use of recycled water.

The source capacity of the existing project wells (190 gpm) should be sufficient to provide for the development project peak groundwater demand of 180 gpm (153 gpm plus 27 gpm for infrastructure and building construction) but does not allow for much flexibility and emergency conditions.

For more flexibility in operation and in order to meet the Remediation and Restoration demands, another well should be a part of this system. A well located about 800 feet east of Well 1 would be expected to have a source capacity of 60-80 gpm based on the available hydrogeologic information. For meeting peak groundwater demands with one of the wells inoperable, an

emergency well could be constructed in the immediate vicinity of Well 1 that would be expected to produce a similar amount of water.

D.5. SUFFICIENCY OF WATER FOR THE PROJECT

The San Luis area groundwater basin will not be overdrafted as a result of the project pumpage. The long-term basin groundwater yield is significantly higher than the combined project pumpage and projected pumpage from the City, agricultural and rural domestic wells.

As described in the previous section, drought water level declines were factored into the long-term yield well water capacity for the project. During the drought of 1987-1990, the City of San Luis Obispo pumped as much as 2000 AFY from the groundwater basin at a time when groundwater recharge was at a very low level. Groundwater level at the Tank Farm property during that time was 15 feet or less below normal groundwater level fluctuations.

As shown by the groundwater production in 1990, the City has the greatest capacity to produce groundwater from the basin. Current policy of the City is that: "Though groundwater is part of the City's portfolio, due to the limitations on its availability and use, the City will not consider this supply in estimating available water resources to meet community needs." Without this production from City wells, the project water wells will not experience the drought water level declines of that historic period. Even under 1990 drought conditions, with City maximum pumping rates and the higher irrigated acreages, the project water wells could maintain the productivity necessary to meet the project demands of 58 acre-feet per year.

E. FINDING AND CONCLUSION

The following determination has been made regarding the above-referenced project:

The total water supplies available during normal, single-dry and multiple-dry water years within a 20-year projection will meet the projected water demand for the project in addition to the demand of existing and other planned future uses.

Respectfully submitted,
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