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ENVIRONMENTAL

Mr. Daniel L. Carlson, PG, CHG, CEG
Senior Engineering Geologist
Attn: Ms. Kristin Pineda, Water Resource Control Engineer
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – CENTRAL VALLEY REGION
1685 E Street
Fresno, CA 93721

Date:
February 10, 2014

Contact:
James W. Babcock

Phone:
510.301.5063

Email:
jim.babcock@arcadis-us.com

Our ref:
06634013.0000

Subject:
Transmittal: Comments on Tentative Waste Discharge Requirements for Coalinga Disposal Site, Coalinga, Fresno County

Dear Mr. Carlson:

On behalf of the Fresno County Department of Public Works and Planning, Resources Division (Fresno County), ARCADIS U.S., Inc. (ARCADIS)] is pleased to provide comments on the Tentative Waste Discharge Requirements for Coalinga Disposal Site, Coalinga, Fresno County, California. We have attached six figures that support our comments.

Finding 1: The first sentence of the finding states, *"Chevron USA, Inc., (a Pennsylvania Corporation)…"*

> **Comment:** We believe Chevron USA, Inc. is now a Delaware Corporation. We confirmed with Mr. Terry Davis of Chevron that Chevron USA is a Delaware Corporation.
>
> Please change the first sentence in Finding 1 to read …"*"Chevron USA, Inc., (a Delaware Corporation)…"*

SITE DESCRIPTION

Finding 10: The Coalinga Disposal Solid Waste Disposal Site is approximately one mile south of the City of Coalinga and one-half mile east of Warthan Creek.

> **Comment:** In the first sentence delete the third word "Disposal" because it appears in the correct word order three words later. There are two oil fields, the landfill is within the Jacalitos oil field and the Coalinga oil field is immediately northwest and north of the landfill (See Figures 4 and 5). We believe the site description should be more detailed and suggest adding the following after the first sentence:
>
> *The facility is within the active Jacilitos Oil Field and south and southeast of the active Coalinga Oil Field as they are defined by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR).*

Finding 11: Land uses within one mile of the facility include irrigated farmland to the north, and undeveloped grass-covered rolling hills to the south, east, and west.

> **Comment:** Land uses within one mile of the facility have changed. Therefore, we suggest changing the finding to:
>
> *Land uses within one mile of the facility include oil field wells and associated oil field operations to the south, west, northwest and north,, irrigated farmland to the north and northeast, industrial commercial development to the northwest along State Highway 198 west of the City of Coalinga.*

Finding 12: Five municipal, domestic, industrial, or agricultural groundwater supply wells have been identified within one mile of the facility.

> **Comment:** Wells within one mile of the facility have changed. Therefore, we suggest changing the finding to:
>
> *Four municipal or agricultural groundwater supply wells have been identified within one mile of the facility in addition to four oil wells to the west and northwest.*

Finding 13: The facility is located along the eastern edge of the Coast Ranges adjacent to the southern San Joaquin Valley. The Tulare and San Joaquin Formations are exposed at the site. The Plio-Pleistocene Tulare Formation is exposed in the northern half of the site and consists generally of stream deposited, crossbedded silty sandstone and conglomerate. Some thin-bedded sandstone, clays, and limestones representing lake deposits are also present in this formation. The base of the Tulare Formation consists of diatomaceous white silty clay located just above a pelecypod deposit containing Mya species. The Pliocene San Joaquin Formation is exposed in the southern half of the site and consists of marine deposited, fine-grained silty sandstone, silt, and clay. The base of the San Joaquin Formation is comprised of the Cascajo Conglomerate layer, which is blue colored conglomerate and sandstone averaging about 50 feet in thickness. The formations dip approximately 17 degrees to the north.

> **Comment:** The bedrock geology of the site is complex and there are at least two versions of geologic mapping for the Jacilitos Hills containing the site (Figures 4 and 5). The site is one the northeast flank of an anticline. The Thomas Dibblee (Dibblee, 1971) version, prepared as a US Geological Survey (USGS) Open-File Report, records rock unit strikes and dips on the map. The rock units near the site generally strike in a northwest or north-northwest direction with dips ranging in the teens.
>
> We recommend modifying the second sentence to read:
>
> *The Tulare and San Joaquin Formations are exposed at the site on the northeast flank of a northwest plunging anticline.*
>
> We recommend modifying the sixth sentence to read:
>
> *The underlying Pliocene age San Joaquin Formation is exposed in the southern half of the site and consists of marine deposited, fine-grained silty sandstone, silt, and clay.*

SURFACE WATER AND GROUNDWATER CONDITIONS

Finding 21: Surface drainage is toward the north in the Kettleman Hydrologic Area. The closest surface water body is Warthan Creek, an intermittent stream, about one half mile from the waste management facility boundary.

> **Comment:** The current WDRs No. 5-00-233 (Finding 14) correctly identifies the facility located on bedrock in the Jacilitos Hills as part of the Juniper Ridge Hydrologic Area (559.20) west of Pleasant Valley. The entire Pleasant Valley Groundwater Basin, a part of the Kettleman Hydrologic Area (558.50), is within the Pleasant Valley Water District. The Pleasant Valley Water District boundary coincides with the Recent age alluvial floor of the

valley and the Pleasant Valley Groundwater Basin does not extend off the valley floor into the Jacilitos Hills. (See Figures 1 through 3)

We recognize that the facility is adjacent to the Pleasant Valley Basin (Tulare Lake Basin Detailed Analysis Unit 245) and also was recognized by the RWQCB in the first sentence in Finding 20 of the current WDRs No. 5-00-233 that states “The site is adjacent to Pleasant Valley.”

Warthan Creek is the closest surface body to the facility however the waste management facility is designed to capture and retain all stormwater on site. We propose the following change to Finding 21:

Near the facility, surface drainage in the Jacalitos Hills, part of the Juniper Ridge Hydrologic Area (559.20) is to the north towards Warthan Creek. Warthan Creek, is the closest surface water body about one half mile from the waste management facility boundary. Warthan Creek is an intermittent West Side Stream that flows from the Juniper Ridge Hydrologic Unit into Pleasant Valley, a part of the Kettleman Hydrologic Area.

Finding 22: The designated beneficial uses of surface water in the Kettleman Hydrologic Area (558.50), as specified in the Basin Plan, are agricultural supply; industrial service supply; industrial process supply; water contact recreation; non-contact water recreation; warm fresh water habitat; wildlife habitat; rare, threatened and endangered species; and groundwater recharge.

Comment: The current WDRs No. 5-00-233 (Finding 15) correctly identifies the facility in the Jacilitos Hills as part of the Juniper Ridge Hydrologic Area (559.20). Figures 1 and 2 from the Tulare Basin Plan show the location of the landfill. The appropriate designated beneficial uses of surface water located in Hydrologic Area 559 is listed in Tulare Lake Basin Plan page II-4 in Table II-1 under West Side Streams.

It should be noted that the waste management facility is designed to capture and retain all stormwater on site so there is no surface flow to any off-site surface drainage.

We request the original language in WDRs No. 5-00-233 (Finding 15) be inserted as the new Finding 22

Finding 24: Monitoring data indicate groundwater quality within the Tulare Formation has electrical conductivity (EC) ranging between 3,630 and 4,800 micromhos/cm, with total dissolved solids (TDS) ranging between 2,900 and 3,800 milligrams per liter (mg/L). Monitoring data indicate groundwater quality within the San Joaquin Formation has EC ranging between 690 and 742 micromhos/cm, with TDS ranging between 415 and 474 milligrams per liter (mg/L).

Comment: As correctly stated in the Tentative WDRs, the range of electrical conductivity (EC) and total dissolved solids (TDS) is very important to establish the poor water quality in the uppermost geologic unit, the Tulare Formation. Also, we believe it is important to present the average concentrations of EC and TDS because they show that over many years groundwater background values in the Tulare Formation far exceed secondary maximum contaminant levels (MCLs) and they are similar to values reported in groundwater from the Pleasant Valley groundwater basin.

Finding 26: The facility is in Detailed Analysis Unit (DAU) 245 of the Tulare Lake Basin Plan. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, and industrial service supply.

Comment: As we have commented earlier for Finding 21, the current WDRs No. 5-00-233 (Finding 14) correctly identifies the facility located on bedrock in the Jacilitos Hills as part of the Juniper Ridge Hydrologic Area (559.20) west of Pleasant Valley. The facility is adjacent to the Pleasant Valley Basin (Tulare Lake Basin Detailed Analysis Unit 245) not in it (See Figure 3). The Tulare Lake Basin Plan correctly identifies the facility in the Juniper Ridge Hydrologic Area (559.20) and Hydrologic Area 559 does not have a Detailed Analysis Unit. It is inappropriate to incorrectly place the landfill in the Kettleman Hydrologic Area (558.50) or state that it is in the Pleasant Valley Detailed Analysis Unit 245 so that the RWQCB can cite beneficial uses of groundwater listed for DAU 245.

For our discussion, we refer to the Tulare Lake Basin Plan.

The Tulare Lake Basin Plan on page I-2 states: "Surface water hydrologic units with the Tulare Lake Basin have been defined and numbered by the Department of Water Resources, as shown on Figure II-1. …Westside streams are surface waters in hydrologic units 556 and **559**… All natural surface waters within the Basin have designated beneficial uses (See Table II-1)"

Groundwater beneficial uses are listed in Table II-2 of the Tulare Lake Basin Plan. Figure II-2 titled Tulare Lake Basin – Detailed Analysis Units (DAU) shows the location, geographic extent, and DAU numbers. Figure II-2 shows the Juniper Ridge Hydrologic unit including the Jacalitos Hills without a DAU number an indication that it is a mountainous recharge area within the Tulare Lake watershed. Referring to Table II-2 an apparent hydrologic unit designation on the bottom of page II-6 is the “All Other Ground Waters” designation. That indicates that MUN was the only groundwater beneficial use in 1993.

The mountainous recharge area of Jacalitos Hills and the Juniper Ridge Hydrologic unit can clearly be seen in the topographic relief map of the DWR California Water Plan Update 2009 (Figure TL-2 on page TL-10) in contrast with the groundwater basins including Pleasant Valley.

CEQA AND OTHER CONSIDERATIONS

Finding 53: Based on the threat and complexity of the discharge, the facility is determined to be classified 2-B, as defined below:

Category 2 threat to water quality, defined as, “Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.”

Category B complexity, defined as, “Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.”

Comment: We believe the Coalinga Solid Waste Disposal Site should not be classified as 2-B and it should remain classified as Category 3-B as determined by RWQCB letter dated March 30, 2011 concerning the Threat to Water Quality (TTWQ) for American Avenue Landfill and Coalinga Landfill.

Threat to Water Quality (TTWQ) is a relative categorization of the waste discharge’s potential effect upon the surface or ground water quality and the beneficial uses of those waters. There are three categories of threat defined in Title 23 California Code of Regulations (CCR) § 2200:

- Category 1 Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish.
- Category 2 Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term

violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

- **Category 3 -Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.**

There are multiple factors to support the original decision by the RWQCB for a Category 3 including the following:

Landfill History – Coalinga Landfill although an unlined Class III landfill:

- It has never shown any indication of groundwater contamination,
- It is within the Jacilitos oil field in the Juniper Ridge Hydrologic Unit and immediate north of the landfill is the Coalinga oil field. Both oil fields have active oil wells with four pumping oil wells within 1,000 feet of the site boundary.
- There is an east-west crude oil pipeline from the San Ardo oil field that traverses the agricultural field and Coalinga oil field immediately north of the site at will limit future changes in property use.
- It is located in a remote area distant from any groundwater supply wells and in an area of poor groundwater quality,
- the County is in the process of having a landfill cap approved and installed that further reduces the TTWQ in the future.

Groundwater quality on-site and off-site both in the Juniper Ridge Hydrologic Unit: and the neighboring Pleasant Valley groundwater basin.

Groundwater within the upper geologic unit at the landfill, the Tulare Formation, is gypsiferous resulting in high sulfate groundwater. Measured inorganic constituents in groundwater from wells in the Tulare Formation have total dissolved solids (TDS) of 2,900 to 3,800 milligrams per liter (mg/L) and sulfate of 1,740 to 1,845 mg/L. We would expect similar groundwater quality in the off-site adjacent groundwater within the Tulare Formation.

Groundwater quality in the northern Pleasant Valley comes from three published sources:

1. Information from a scientific article *Domestic Water Supply Demineralization at Coalinga* by E.S. Cary, H. J. Ongerth, and R. O. Phelps, in Journal American Water Works Association (AWWA) May 1960, pp 585 – 593. The following information is excerpted:

   In 1958, the City of Coalinga pilot tested a desalination process. The raw water apparently came from a local well within the City, part of the Pleasant Valley groundwater basin. Table 2 reported raw water *analyses for TDS averaging 2,392 parts per million (ppm) and sulfate averaging 1,158 ppm*

2. Information from *Ground-Water Hydrology of Pleasant Valley, Fresno County, CA* by Y. Kahanovitz and J.C. Manning (Stanford University Publications, University Series – Geological Sciences, Volume IV, 1954) is excerpted in the following paragraphs:

   "The youngest sediments (mapped by others as Quaternary alluvium) *in Pleasant Valley are gypsiferous…the ground water is a hard sulfate water…it is sufficient commentary on the general quality of the water to note that it is necessary to import drinking water to the town of Coalinga.*

   The concentration of total dissolved solids in the near surface ground water ranges from 1,200 up to 2,000 parts per million. The predominant (ionic) constituents are, in order of concentrations, sodium, sulfate, magnesium, calcium, bicarbonate, and chloride. The water could, in many cases, be classified as a sodium-sulfate water. It is obviously poor drinking water. The corrosive and scale-forming qualities of the water make it poor for most industrial purposes. For irrigation water, it is suitable only for crops that have considerable tolerances for alkali and sulfate"

3. Information from a scientific article *Land Subsidence in Pleasant Valley Area, Fresno County, Calif.* by N. P. Prokopovich and D. C. Magleby, in Journal American Water Works Association (AWWA) April 1968, pp 413 – 424 with typographic corrections from October 1968 p. 1103. The following information is excerpted:

   Most of the water used in the (Pleasant) valley is pumped from ground water sources to be used for irrigation. Fresh-water aquifers occur both in the Recent and Plio-Pleistocene alluvial fill and are underlain by brackish ground water bodies occurring in older, predominantly marine, sedimentary rocks. Water in the alluvial fill is of the sodium-sulfate type with a total dissolved solids range of 850 – 3,000 ppm, averaging 1,500 ppm.

Natural Resources Conservation Service -Web Soil Survey, accessed on January 28, 2014 presents regional maps of sodic soils and the areas in the Coalinga area of Pleasant Valley are impacted by high sodium values in soils. There are numerous areas shown on the maps however the area at the mouth of Warthan Crreek immediately north of the site is one of those areas (Figure 6). If the soils are impacted by sodium they are likely impacted by sulfate from the gypsiferous-bearing (calcium sulfate) rocks eroding from the Juniper Ridge Hydrologic area.

City of Coalinga's struggle for potable water, started before the City was founded, relates to the broader issues of obtaining potable water quality from groundwater in the Pleasant Valley groundwater basin. The following discussion is from the *City of Coalinga 2005 Urban Water Management Plan:*

> *In 1887, the railroad (Southern Pacific RR) pushed through Pleasant Valley, establishing a coaling station and coal-shipping junction to utilize the coal from the now abandoned San Joaquin Valley Coal Mining Company. The groundwater in the area, however, was poor being very high in total dissolved solids (salts) and not suitable for drinking. From the earliest days, good quality water was imported in railroad tank cars from Armona, California to supply drinking water for the settlement being established around the Coaling Station "A" loading site (Coalinga).*
>
> *Early Coalinga homesteaders dug their own water wells, and the few lucky enough to get drinkable water from the ground shared with their less fortunate neighbors, who carted the water home. Some settlers used oil as fuel to distill undrinkable groundwater in small batches. Water continued to be imported by railroad tank cars. Most Coalinga residents wanting drinking water were forced to obtain their water at the railroad and transport it home. Later, the Coalinga Domestic Water Company began home delivery of drinking water. First, a horse-drawn sled and then a wagon was employed to bring water to 80-gallon tanks either in front or back of the houses, whichever was most accessible to the delivery man. This was eventually followed by motor truck delivery to the homes.*
>
> *Coalinga's oil industry was born when a hand-dug well, 153 feet deep, produced 27 barrels in the first three days of production. …. As the extraction of oil continued, however, the production decreased. To reverse this trend, the oil industry developed a new process of injecting water into the wells to assist with the oil extraction. This process, still used today though to a lesser extent, requires very high quality water – a commodity not readily available in Coalinga until 1972.*
>
> *In 1972, the City of Coalinga received its first delivery of San Luis Canal surface water from the State/Federal water system. Since 1972, the City has relied solely on treated surface water to meet its potable water needs. All City wells have been abandoned and there is no groundwater currently furnished by the City.*
>
> *Before 1972, agriculture was limited to growing cotton, and other salt-water resistant crops. With the coming of imported surface water*

the area has become rich in specialty crops such as lettuce, tomatoes, asparagus, garlic, and a variety of nut and fruit trees.

We believe the summaries above are sufficient to re-affirm the TTWQ classification 3-B, a determination made by the RWQCB in March 2011 and we request the Tentative WDRs TTWQ classification be changed from 2-B to 3-B. We propose the following language:

Finding 53. Based on the threat and complexity of the discharge, the facility is determined to be classified 3-B, as defined below:

Category 3 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."

Category B complexity, defined as, "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units."

H. PROVISIONS

Provisions H-1: The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-2014-XXXX and the SPRRs, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

Comments: The closed facility has no structures at the site. We recommend modifying Provision H-1 using language similar to Provision G-2 in WDRs R5-2010-0072, for the closed Tulare County Exeter Landfill. The suggested language is as follows:

The Discharger shall maintain a copy of this Order at the offices of the Fresno County Department of Public Works & Planning – Resources Division, including the MRP R5-2014-XXXX and the SPRRs, and make it available during working hours to facility maintenance personnel, who shall be familiar with its contents, and to regulatory agency personnel.

ATTACHMENT B

Attachment B – SITE MAP FOR COUNTY OF FRESNO AND CHEVRON USA, INC., COALINGA SOLID WASTE DISPOSAL SITE CLASS III LANDFILL, CLOSURE AND POST-CLOSURE MAINTENANCE, FRESNO COUNTY, WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2014-XXXX

> **Comments:** The Site Map shows the waste management units and the boundary of the property. The east edge of both the waste management units shows that waste was inadvertently deposited off the property. We believe the intent of the tentative WDRs is to move the site into a Closure and Post-Closure Maintenance period. As such we believe the areas shown outside the property boundary should be identified as area where the waste will be repositioned inside the property during closure activities.
>
> We request that the map be edited to include an additional item in the explanation block that identifies a pattern that indicates waste areas on the map with that pattern will be relocated into the WMU(s) during closure activities.

If you have any questions concerning this submittal, please call Mr. Curtis Larkin at 559 600-4306.

Sincerely,

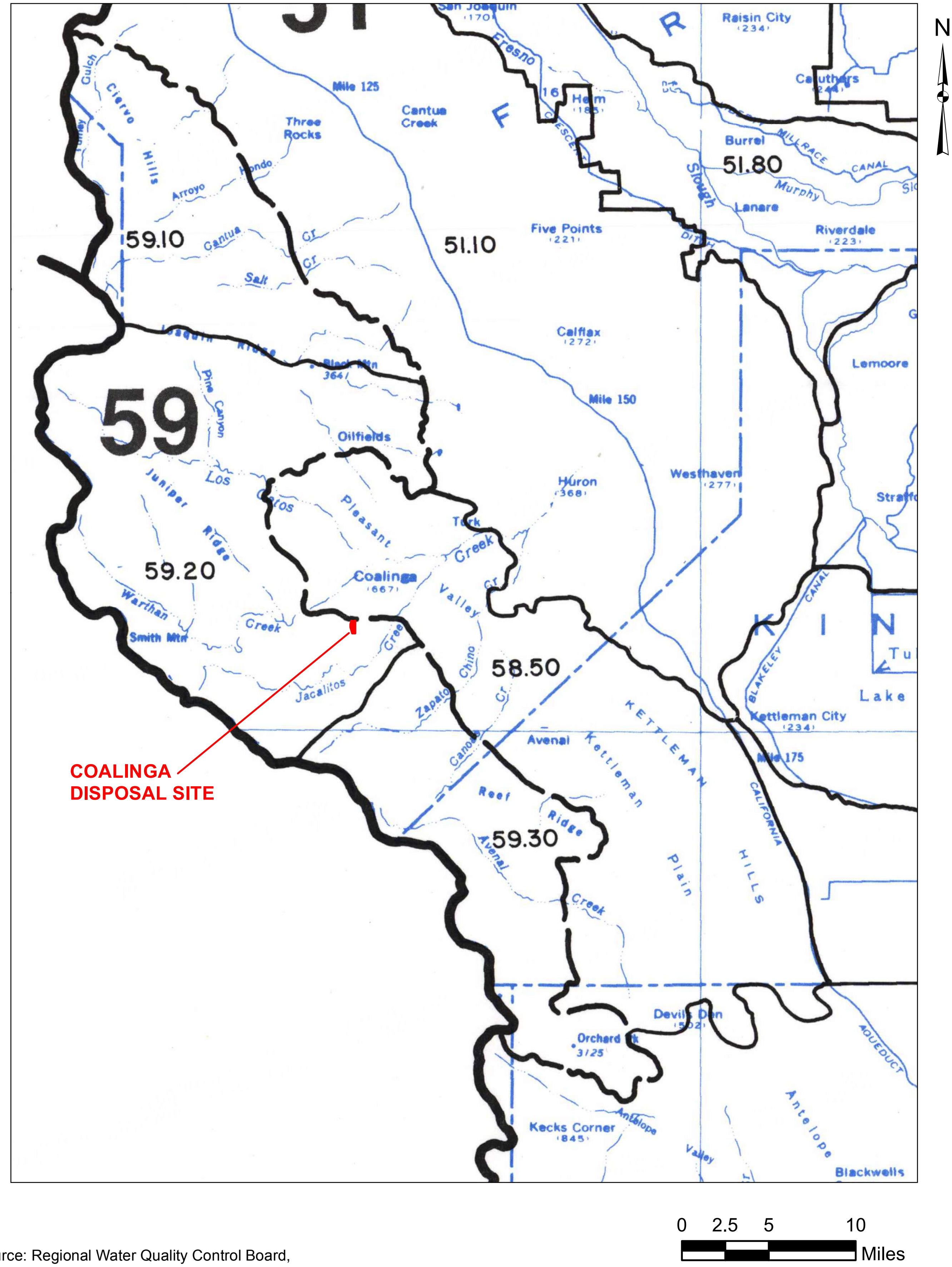
ARCADIS U.S., Inc.

PROFESSIONAL GEOLOGIST • James W. Babcock No. 4515 • STATE OF CALIFORNIA

James W. Babcock, Ph.D., P.G.
Principal Geologist / Scientist

Copies:

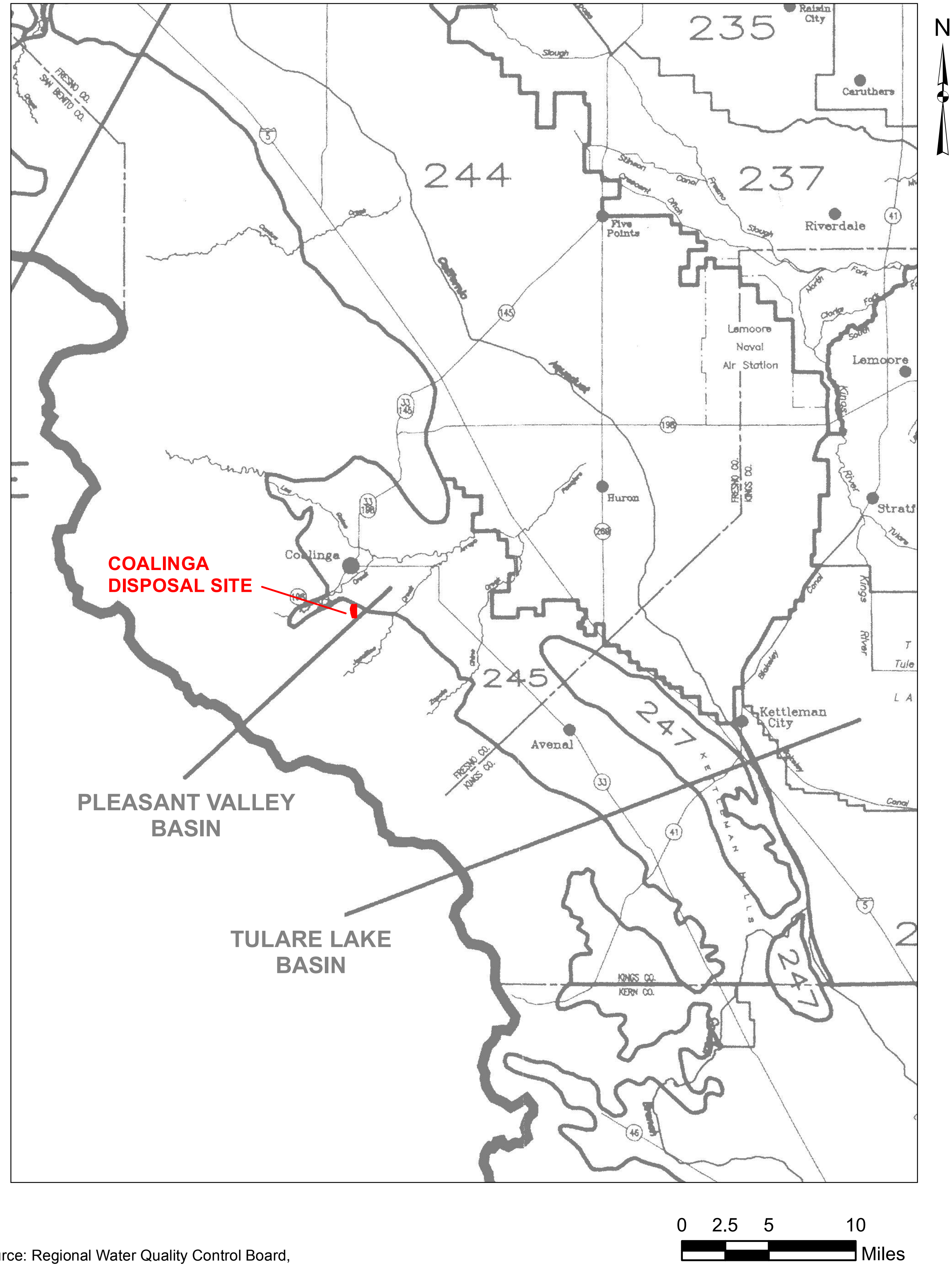
Curtis Larkin, Fresno County, Dept. of Public Works & Planning, Resources Division
Herb Cantu, Fresno County, Dept. of Public Works & Planning, Resources Division
Terry Davis, Chevron USA, Inc., Bakersfield, California



Source: Regional Water Quality Control Board,
Tulare Lake Hydrologic Basin Planning Area

ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	TULARE LAKE HYDROLOGIC BASIN MAP - HYDROLOGIC UNITS	FEBRUARY 2014 FIGURE 1

Path: G:\Projects\06634001\GIS\Coalinga GIS\Project_MXDs\006 - Basin Map.mxd



Source: Regional Water Quality Control Board,
Tulare Lake Basin Detailed Analysis Units

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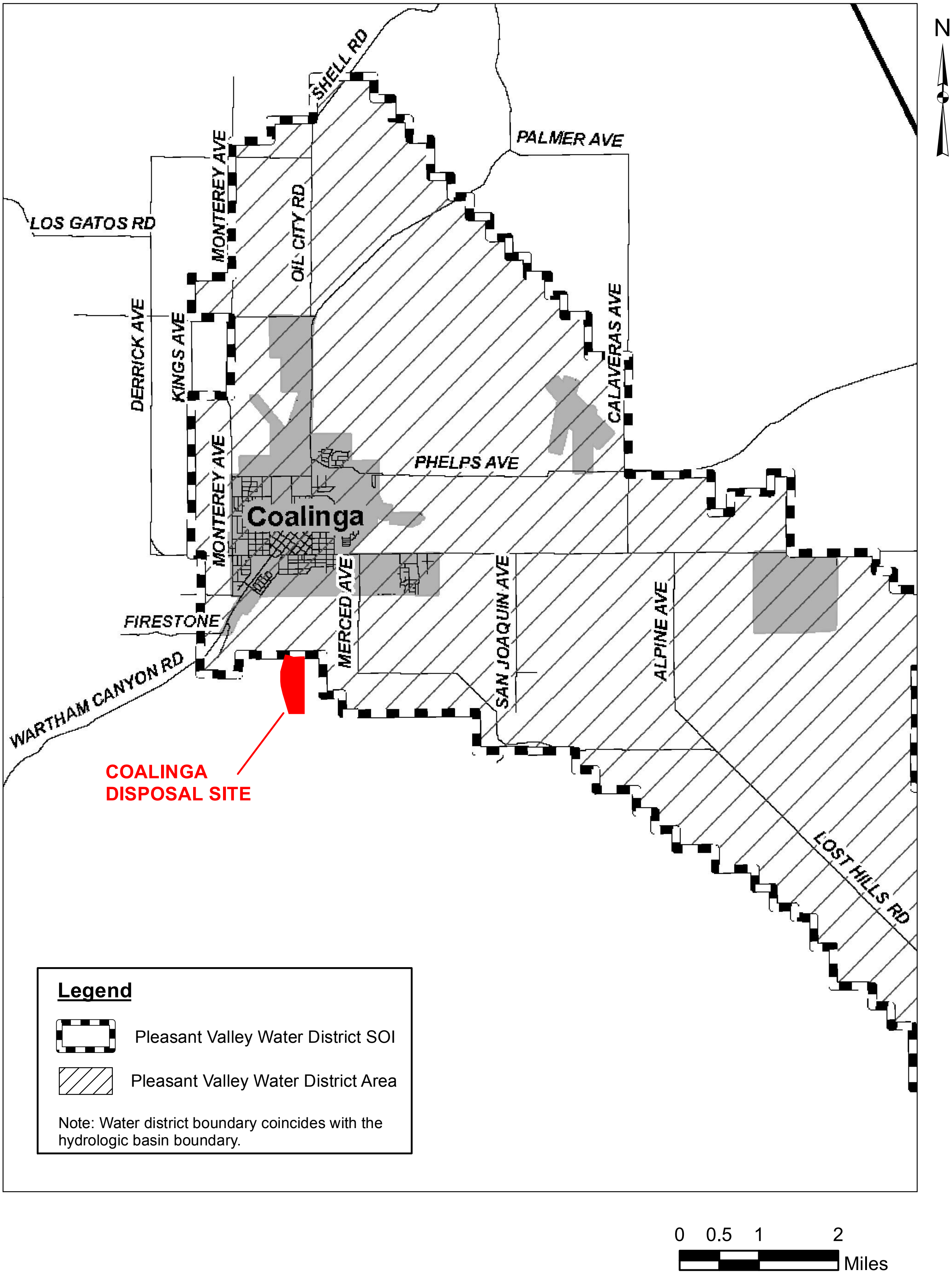
ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	TULARE LAKE HYDROLOGIC BASIN MAP - DETAILED ANALYSIS UNITS	FEBRUARY 2014 FIGURE 2



Source: County of Fresno, 2007; PMC, 2007

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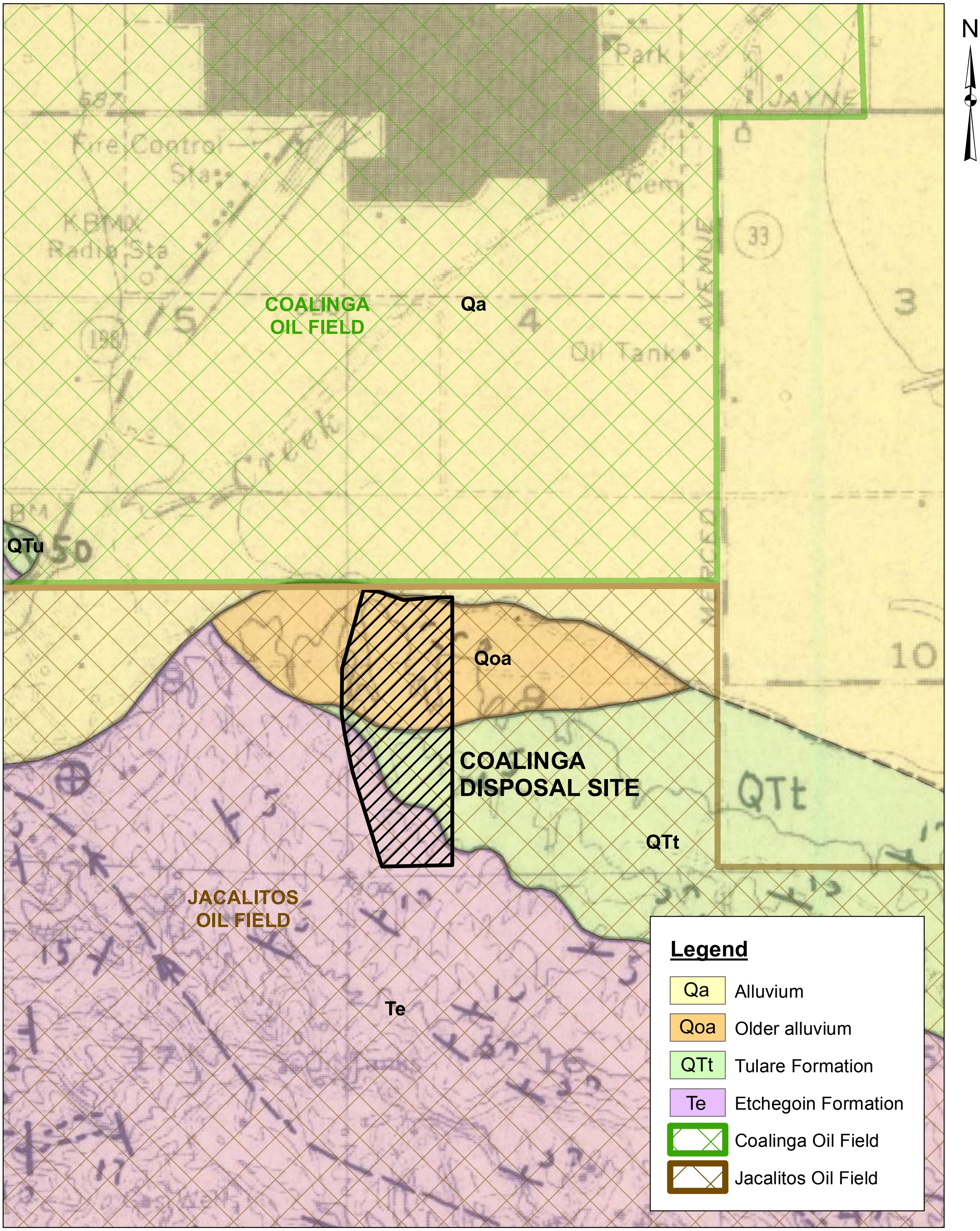
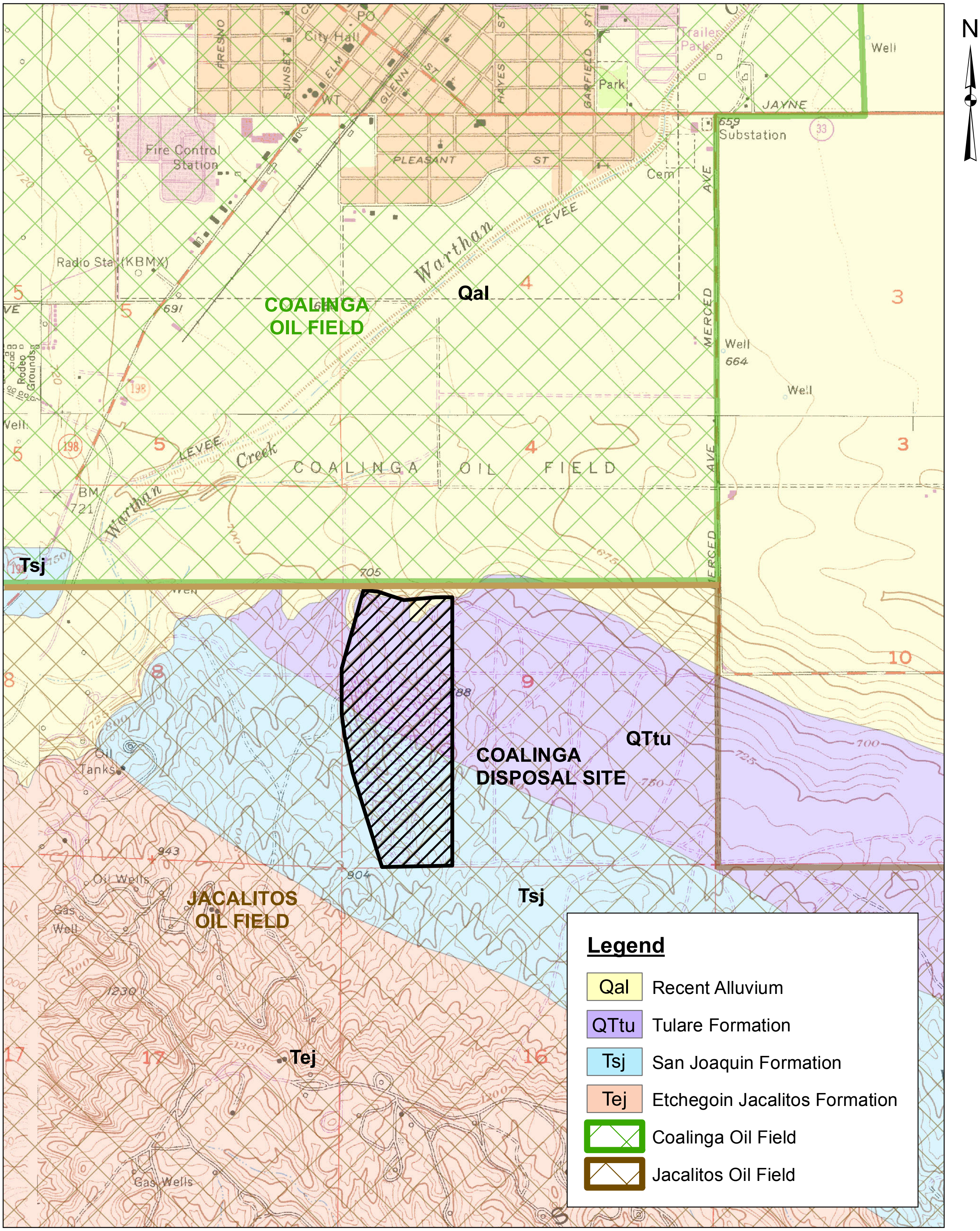
ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	PLEASANT VALLEY WATER DISTRICT BOUNDARY	FEBRUARY 2014 FIGURE 3



Sources:
Dibblee, T. W. Jr., 1971, Geologic Map of the Coalinga Quadrangle, California (Field mapping conducted in 1968 and 1969);
Department of Conservation, Division of Oil, Gas, and Geothermal Resources, GIS data, accessed January 28, 2014

ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	SITE GEOLOGY - DIBBLEE VERSION	FEBRUARY 2014 FIGURE 4

Path: G:\Projects\06634001\GIS\Coalinga GIS\Project_MXDs\008 - 1971 Site Geology Map.mxd



Sources:
Fowkes, E.J, 1982, Guidebook to the Geological Resources of the Coalinga District California;
Department of Conservation, Division of Oil, Gas, and Geothermal Resources, GIS data, accessed January 28, 2014

0 0.25 0.5 1 Miles

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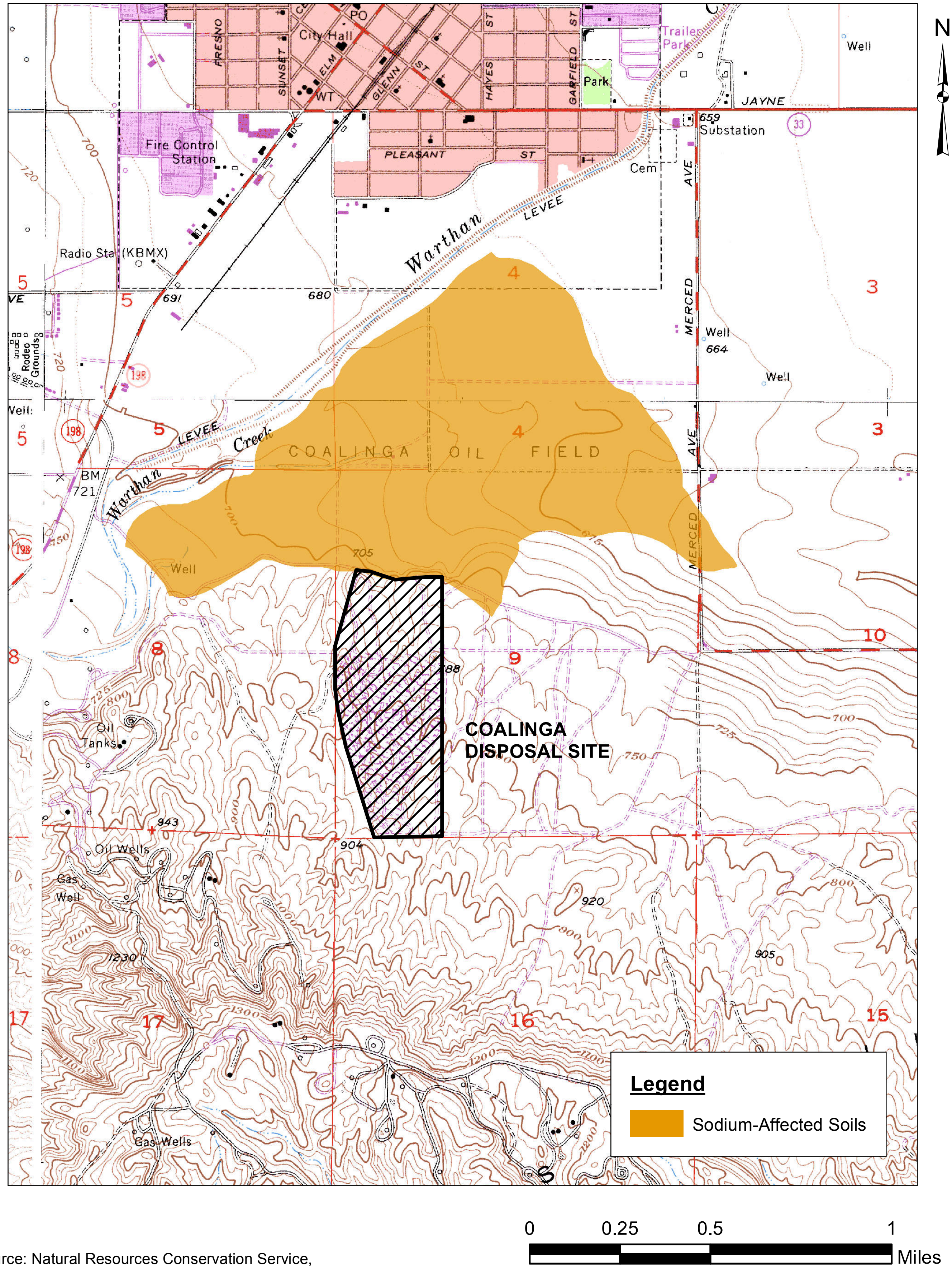
ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	SITE GEOLOGY - FOWKES VERSION	FEBRUARY 2014 FIGURE 5



Source: Natural Resources Conservation Service, Web Soil Survey, accessed January 28, 2014

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ARCADIS	COALINGA DISPOSAL SITE COUNTY OF FRESNO	Sodium-Affected Soils	FEBRUARY 2014 FIGURE 6