

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

ORDER No. R2-2018-0014

**UPDATED SITE CLEANUP REQUIREMENTS AND
RECISSION OF ORDER Nos. R2-2006-0065 AND R2-2012-0081 for:**

**PHILLIPS 66 COMPANY
SAN FRANCISCO REFINERY
1380 SAN PABLO AVENUE
RODEO, CONTRA COSTA COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the Water Board), finds that:

SITE LOCATION

1. Phillips 66 Company (hereinafter called Phillips 66 or the Discharger) owns and operates the San Francisco Refinery (refinery), located at 1380 San Pablo Avenue, Rodeo (Fig. 1). The refinery encompasses an area of approximately 1,100 acres consisting of a 495-acre active area, where all its facilities and equipment are located, and another 600 acres of undeveloped land (Fig. 2). The two most prominent topographic features at the refinery are Tormey Hill Ridge, which extends along the northeastern boundary, and the central valley that lies between Tormey Hill Ridge and the lower hills to the southwest. The majority of the refinery is constructed in a valley (labeled “Central Valley” on Figure 3). The northwestern boundary of the refinery is located along the shoreline of San Pablo Bay. Approximately 95 percent of the area included within the refinery’s boundaries drains along the Central Valley toward San Pablo Bay, with the remainder flowing northward into Cañada del Cierbo Valley (Fig. 3).

PURPOSE OF ORDER

2. Pursuant to California Water Code section 13304, this Order requires the Discharger to perform site investigations and to continue monitoring the effectiveness of corrective action measures implemented at specified areas of the refinery. This Order:
 - Rescinds and supersedes outdated Site Cleanup Requirements (SCRs);
 - Updates refinery ownership information to better reflect the historical ownership;
 - Requires the Discharger to issue an initial report for the Tar Seep Area investigation; and
 - Requires the Discharger to ensure that its remediation systems and monitoring programs are operated, evaluated, and modified in accordance with the requirements of this Order.

REGULATORY HISTORY

3. The refinery contains both active and inactive waste management units (WMUs) regulated under California Code of Regulations (CCR) title 27 (Fig. 4). The active WMUs consist of two process water surface impoundments: the Main Storm Basin and the Effluent Safety Basin, described below. Industrial wastes from the refinery historically were discharged into areas subsequently designated by the Water Board as WMUs pursuant to CCR title 27. The Water Board adopted WDRs to regulate such discharges to land at these closed WMUs. In addition,

the Water Board has adopted SCRs pursuant to the California Water Code (CWC or Water Code) to require cleanup of spills and leaks at the refinery that are not directly associated with designated WMUs.

4. The Water Board has regulated water quality at the refinery under the following orders:
 - WDR Order No. 89-090 required further investigation of the refinery's WMUs and increased monitoring around the refinery perimeter;
 - SCR Order No. 93-046 specified requirements for investigation and cleanup of spills, leaks, and contamination of soil and groundwater pursuant to CWC section 13304;
 - SCR Order No. 95-209 updated the site's groundwater monitoring program and implemented the perimeter groundwater control systems.
 - WDR Order No. 97-027 rescinded Order No. 95-209 and required further investigation and remediation of soil and groundwater, as well as enhancement of the refinery's groundwater containment systems;
 - WDR Order No. R2-2005-0026 rescinded Order No. 97-027 and updated the Self-Monitoring Plan (SMP) monitoring schedule and provided a status update on WMUs and groundwater containment systems;
 - SCR Order No. R2-2006-0065 rescinded Order No. 93-046 and required the Discharger to evaluate efficacy of groundwater migration control and light non-aqueous phase liquid recovery at the refinery. SCR Order No. R2-2006-0065 was amended by Order No. R2-2012-0081 to include Phillips 66 Company as a Discharger;
 - WDR Order No. R2-2015-0046 updated the requirements for continued maintenance and monitoring of closed WMUs and rescinded Order No. R2-2005-0046. The SMP that was attached to and adopted with Order No. R2-2015-0046 combined the detection monitoring required by the WDRs with the corrective action monitoring required by SCR Order No. R2-2006-0065.
 - Order No. R2-2016-0044 reissued the refinery's National Pollutant Discharge Elimination System (NPDES) permit, which regulates the discharge of treated refinery wastewater and stormwater runoff, non-contact once-through cooling water, demineralizer regeneration wastewater, and stormwater runoff from sections of Interstate 80 and San Pablo Avenue that adjoin the refinery. The refinery is not covered by an industrial stormwater permit because rain and runoff from operation areas are collected, treated, and discharged under the NPDES permit.
 - Order No. R2-2017-0041 reissued a general NPDES permit implementing the regional mercury and PCBs load allocations for municipal and industrial wastewater discharges, as set forth in the San Francisco Bay Mercury Total Maximum Daily Load (TMDL). That permit imposes mercury and PCBs effluent limitations on the refinery.
5. This Order rescinds and supersedes SCR Order No. R2-2006-0065 and its amendment, Order No. R2-2012-0081. All tasks, provisions, and specifications required by these previous orders have been satisfactorily completed.

SITE DESCRIPTION AND HISTORY

6. Petroleum refining operations began at the site in 1896. Today, the refinery processes crude oil into a variety of products, including butane, gasoline, diesel fuel, jet fuel, fuel oil, petroleum coke, and sulfur. Lubricating oil and wax were manufactured at this facility in the past, although these operations ceased in 1997. Wastewater from the refining processes, and most of the stormwater that is generated during rainfall events, is contained by the refinery sewer system and routed to the Unit 100 Waste Water Treatment Plant (WWTP) for treatment and discharge pursuant to the refinery's NPDES permit and general NPDES permit (Order No. R2-2012-0096).
7. Currently, the refinery receives crude oil and other feedstocks and delivers refined products via tanker barge, rail car, truck, and pipeline. The facility includes approximately 100 aboveground storage tanks that store crude oil and refined products. The total maximum petroleum storage capacity is about 8,500,000 barrels (42 gallons/barrel). Daily crude-oil throughput is approximately 100,000 barrels.
8. Wastes generated from the refining and manufacturing processes were historically disposed of at various WMUs throughout the refinery or sent to offsite disposal facilities. These WMUs have all been closed. Unauthorized releases (i.e., spills and leaks) to the environment have also occurred at the refinery, as discussed below in findings 19, 20, 21, and 22.
9. The refinery has undergone several changes in ownership and names, as follows:
 - 1896 to 1983: Union Oil Company of California
 - 1983 to 1997: Unocal Corporation
 - 1997 to 2001: Tosco Corporation
 - 2001 to 2002: Phillips Petroleum
 - 2003 to 2012: ConocoPhillips Company
 - 2012 to present: Phillips 66 Company.
10. In December 2003, ConocoPhillips Company purchased the former Pacific Gas and Electric Company (PG&E) Oleum Power Plant, which is located in the interior of the western side of the refinery property (Fig. 5). The former PG&E Oleum Power Plant (OPP) property and Outfall Channel are now part of the refinery and subject to this Order, with the exception of a small relay structure that PG&E maintains ownership of in the central portion of the refinery property.

Geologic Setting

11. The refinery is located on the floor and slopes of the Central Valley, which is associated with an east-west trending syncline. The axis of the syncline dips to the west towards San Pablo Bay, with the northern limb dipping almost vertically and the southern limb dipping at an approximately 35 degree angle. The general stratigraphic sequence of lithologic units at the refinery, from the ground surface downward, are imported fill, unconsolidated Bay sediments (Bay Mud, sands, then older Bay Mud), Montezuma Formation, Pinole Tuff and associated clastic sediments, and San Pablo Group bedrock units. The unconsolidated Bay sediments pinch out inland.

12. Along the Bay margin, fill is underlain unconsolidated Bay sediments dating from the late Pleistocene to Holocene. Beneath these sediments and where present, the typical sequence is approximately 10 feet of Bay Mud overlying a thicker accumulation of sand and an underlying unit of older Bay Mud. The Bay Mud typically consists of clay or silty clays with localized areas of partially decayed vegetation or peat. The underlying sand ranges from very fine sand or silt to medium or coarse sand. Thicker accumulations of bay sediments are present in two buried valleys beneath the Bay Front area. The larger valley lies beneath the Primary Storm Basin and Main Storm Basin and extends underneath the Effluent Safety Basin. The other valley extends from just south of the former PG&E OPP towards the ESB, where the two merge.
13. Bay sediments appear to overlie the nearly flat-lying Montezuma Formation in the area of San Pablo Avenue. The Montezuma Formation is of early Pleistocene age and has been characterized as a series of poorly indurated pebbly gravels, sand, and silts. Underlying the remainder of the refinery area is bedrock associated with the Pliocene Pinole Tuff and underlying Miocene San Pablo Group. These units have been structurally deformed and form the aforementioned syncline. They include volcanic tuffs of the Pinole formation and shales and sandstones of the Neroly and Cierbo formations.
14. Fill material underlies many areas of the refinery but is most common at the refinery's San Pablo Bay perimeter, where the intertidal margins of the Bay were reclaimed and developed by previous landowners. Fill material is also found in interior refinery work areas, where terraces for new structures were developed on the sloping topography, and along the margin of the Interstate 80 highway viaduct. The area bounded by current San Pablo Avenue, the Union Pacific Railroad tracks, and the former PG&E Outfall Channel was a low-lying embayment before railroad tracks were constructed in the mid-1880s. These tracks spanned the intertidal area and effectively isolated it from San Pablo Bay, forming an interior wetland. The entire area was systematically developed during the first half of the 1900s with several episodes of fill importation that brought the area to current grade.

Seismicity

15. The refinery is located approximately midway between the active Hayward fault, about 7 miles southwest, and the Concord-Green Valley fault, about 14 miles southeast. The Hayward fault trends to the northwest within the East Bay, extending from San Jose 60 miles north to San Pablo Bay in Richmond, where it converges with the Calaveras fault, which continues north to Suisun Bay. The Hayward fault generated two sizable earthquakes, both in the 1800s, and the USGS Working Group on California Earthquake Probabilities lists the Hayward-Rodgers Creek Fault Systems among the faults that have the highest probability of generating earthquakes of magnitude 6.7 and greater.

Hydrogeologic Setting

16. The refinery is not located within a State-designated groundwater basin; however, two unofficial groundwater basins underlie or partially underlie the refinery. The main groundwater basin, referred to as the Refinery Groundwater Basin, includes the entire area south/southwest of Tormey Hill Ridge, including the Central Valley and Bay Front areas. The groundwater gradient typically follows topography, such that groundwater migrates to the southwest off Tormey Hill Ridge and then northwest through the Central Valley toward San Pablo Bay. The

smaller Tormey Groundwater Basin is the area located northeast of Tormey Hill Ridge extending down into Cañada del Cierbo. This basin has a northeast sloping groundwater gradient within the refinery boundary toward the bottom of Cañada del Cierbo and the ephemeral creek present in portions of it. This basin underlies a small portion of the upper tank farm (Fig. 2).

17. The groundwater surface elevation east of Interstate 80 ranges from 120 to 300 feet above mean sea level and slopes from the hills northwestward towards the Central Valley. The water-bearing zone is generally fractured sandstone. The groundwater surface elevation between Interstate 80 and San Pablo Avenue ranges from less than 10 feet above mean sea level (MSL) in the Primary Storm Basin/Main Storm Basin area to as much as 200 feet MSL along Tormey Ridge.

Groundwater flow is generally to the southwest along Tormey Ridge and to the northwest in the Central Valley. Both north and south of the former PG&E Outfall Channel (Fig. 2), the water table occurs from 6 to 10 feet above mean sea level along most areas of the Bay Front, with a gradient towards San Pablo Bay.

18. There are two hydrogeologic settings along the western boundary of the refinery property, near San Pablo Bay and its shoreline. The first hydrogeologic setting is observed near the shoreline extending from the former PG&E Intake (near Tank 103) and extending southwestward through the Marine Terminal Area to the Tank 302 area. This area includes the Marine Terminal Groundwater Protection System and Main Interceptor Trench Alignment E and related recovery wells. Subsurface conditions are characterized by a water-bearing, heterogeneous fill of variable thickness and underlain by a sequence of interbedded bay sand and mud lithologic units and overlying a deeper bedrock unit. The depth to groundwater ranges from 3 to 9 feet below ground surface (bgs). There is very limited tidal influence overall in this setting.

The second hydrogeologic setting spans the remaining distance of the shoreline, extending south from the Tank 100 area to the southwestern limits of the Refinery property near the Rodeo Sanitation District wastewater treatment plant. This area includes the Main Interceptor Trench Alignments A through D and F and related B-Zone extraction wells. Within this setting, there are two water-bearing zones, the A-Zone (upper water-bearing zone) and the B-Zone (deeper water-bearing zone). The A-Zone represents water table conditions and occurs within heterogeneous fill underlain by younger Bay Mud deposits from about 4 to 9 feet bgs. The B-Zone occurs in sand deposits beneath the young Bay Mud at 11 to 22 feet bgs and is tidally-influenced.

Transmissive Zone	Typical Depth to Top of Water-Bearing Zone (feet bgs)
Marine Terminal Area/Tank 302 Water Table	3 to 9
Main Interceptor Trench Area A-Zone	4 to 9
Main Interceptor Trench B-Zone	11 to 22

HISTORICAL SPILLS, RELEASES, AND CLEANUP ACTIONS

19. Portions of the refinery contain soil and/or groundwater that have been impacted by historical releases, and a variety of corrective action steps have been implemented. Releases associated with WMUs that are in the CCR title 27 Detection Monitoring Program are regulated under

WDR Order No. R2-2015-0046 and are not discussed here. This Order addresses releases and corrective actions that are not directly associated with WMUs, referred to as Areas of Concern (AOCs). These AOCs are the following:

- a. Refinery Groundwater Basin Perimeter (RGBP) – This area includes the northern and western boundaries (including the Effluent Safety Basin) of the Refinery that border San Pablo Bay and includes three perimeter hydraulic containment systems. The three perimeter hydraulic containment systems include: 1) Main Interceptor Trench (MIT) and associated B-Zone Extraction System, 2) Tank 302 Interceptor Trench and associated B-Zone Extraction System, and 3) the Marine Terminal Area (MTA) Groundwater Barrier System, described in more detail below. The recovered fluids from these systems are pumped to the process sewer system and treated at the Unit 100 WWTP.

The MIT and associated B-Zone Extraction System were constructed to control offsite migration of contaminated groundwater and free-phase liquid petroleum hydrocarbons (FPLH; also known as light non-aqueous phase liquid or LNAPL) along approximately 3,000 feet of the western portion of the RGBP. The MIT consists of multiple segments termed alignments (A through F) completed in the A-Zone. The MIT B-Zone Extraction System consists of 12 extraction wells installed along the western RGBP between the former PG&E Outfall and the E-003 Outfall Channel, to hydraulically control offsite groundwater migration in the deeper water-bearing zone.

The Tank 302 Area Interceptor Trench (also known as Alignment “E”) and B-Zone Extraction System was installed in the western portion of the Marine Terminal Area near Tank 302. The system includes an interceptor trench segment with five extraction sumps installed within the A-Zone and three extraction wells in the B-Zone.

The MTA Groundwater Barrier System was constructed to control offsite groundwater migration along approximately 2,000 feet of the northern RGBP. The system extracts total fluids (groundwater and FPLH) along the refinery perimeter from 41 groundwater wells screened across the water table (a distinct A-Zone and B-Zone, as observed along the remainder of the RGBP, are not observed in the MTA) from the PG&E Intake Pumping System. A steel plate was installed at the PG&E Intake along the shoreline to stop discharge of site groundwater into San Pablo Bay. Groundwater accumulates behind the steel plate and the water is pumped from the structure into the MTA fluid conveyance system.

The RGBP is monitored by a system of wells as set forth in the Corrective Action Monitoring Plan (CAMP). The wells are used to monitor water quality associated with various historical releases and to evaluate the effectiveness of the perimeter hydraulic containment systems.

- b. IWS 5 and 8 – Inactive Waste Sites (IWS) 5 and 8 are located adjacent to each other in the northwest portion of the refinery near the San Pablo Bay shoreline. IWS 5 was reportedly used for disposal of leaded gasoline tank bottom sludges. IWS 8 was reportedly used for the disposal of acid sludge. The two inactive waste sites are paved over and are now used as storage, salvage operations, and contractor work areas. The constituents of concern (COCs) in groundwater include petroleum hydrocarbons (TPH-D), metals (arsenic, barium, cadmium and chromium), VOCs, SVOCs, and pH. Groundwater contaminants from IWS 5

- and 8 are contained and removed by Alignments B and C of the MIT and the MIT B-Zone groundwater extraction wells. The interceptor trench system and B-Zone extraction wells were installed downgradient of IWS 5 and 8 and were designed to contain the migration of contaminants from IWS 5 and 8. IWS 5 and 8 are evaluated under the CAMP, with the remediation systems serving as the corrective action.
- c. Downgradient Trench Perimeter (DGTP) – The DGTP is located on the western boundary of the Refinery between the MIT and San Pablo Bay. The DGTP wells are used to monitor the groundwater downgradient of the remediation systems and are included in the CAMP.
 - d. Former PG&E Oleum Power Plant (PG&E OPP) – The PG&E OPP is located along the western section of the refinery along San Pablo Avenue and north of the Unit 100 WWTP. The former PG&E OPP was acquired by the Discharger in December 2003. Site investigation results indicate the presence of TPH, VOCs, and metals in most site wells. PAHs were detected in two wells and PCBs were detected in one well.
20. Free-Phase Liquid Petroleum Hydrocarbon (FPLH) Recovery Program Areas – Removal of FPLH is conducted periodically or continuously, depending upon the volume and recoverability. The MIT and B-Zone Extraction System, Tank 302 Area Interceptor Trench and B-Zone Extraction System, and the MTA extract total fluids and provide hydraulic control of groundwater for the RGBP. Areas of the refinery undergoing FPLH recovery not addressed by the RGBP hydraulic containment systems are listed below and illustrated on Figure 6:
- a. Primary and Main Storm Basin (PSB/MSB) Extraction System – The PSB/MSB Extraction System is a total fluids extraction system consisting of eight extraction wells (MW-205 through MW-210R, MW-239, and MW-240), located adjacent to or near the northwest side of the MSB, and extraction well MW-23 located adjacent to the western edge of the MSB, downgradient of the PSB. Extracted fluids from the PSB/MSB extraction wells are pumped through conveyance lines to the Unit 100 WWTP.
 - b. Unit 76 Active Skimmer Extraction System – The Unit 76 Active Skimmer Extraction System consists of 10 extraction wells with FPLH skimming pumps (MW-132, MW-134, MW-186, MW-234 through MW-237, PZ-11, PZ-12, PZ-15). The recovered FPLH is conveyed to a storage tank where it is removed on an as-needed basis using a vacuum truck.
 - c. Tank 100 Interceptor Trench – The Tank 100 Interceptor Trench extracts total fluids from one sump to control FPLH seeps in various locations along the east side of the Tank 100 containment area. The effluent from the system is conveyed to the Unit 100 WWTP.
 - d. Area 6 Seep Mitigation System – The Area 6 Seep Mitigation System is system is located along the toe and slope of the Main Gate Road embankment slope adjacent to the western edge of the former PG&E cooling water discharge channel (PG&E Outfall Channel). The system prevents FPLH from migrating toward the PG&E Outfall Channel. The system is a passive, total fluid collection system that includes an interceptor trench filled with permeable aggregate, a shotcrete surface slope cover, and a central extraction sump (well S-17) to facilitate removal of accumulated liquid by vacuum truck.

- e. Unit 200 Seep Mitigation System – The Unit 200 Seep Mitigation System is located along the toe of the Road 7 embankment slope adjacent to Unit 200, southwest of Tank 202. The Unit 200 System consists of a passive, total fluid collection and drainage system that mitigates uncontrolled FPLH surface seepage from migrating onto a service road in Unit 200. The system facilitates gravity drainage of accumulated liquid to a Unit 200 process sewer catch basin.

Additional Investigations

21. Phillips 66 performed investigation activities in 2017 in the area where tar periodically seeps onto a facility road (see Tar Seep Area on Figure 7) during warmer weather conditions. Task 7 requires the submission of an investigation report and recommendations for next steps for all areas and monitoring wells not undergoing active remediation.

Corrective Actions for Groundwater

22. Phillips 66 has implemented corrective actions to remediate groundwater impacts in release areas and to intercept contaminated groundwater and FLPH, thereby preventing migration and discharge to San Pablo Bay. These corrective actions include: 1) groundwater extraction using extraction wells and interceptor trenches, and 2) FPLH removal via the same extraction wells and interceptor trenches used to remove contaminated groundwater as well as from monitoring wells containing measurable FPLH using various manual removal methods (e.g., bailer, vacuum truck). Monitored natural attenuation for petroleum hydrocarbons has been approved by the Water Board as a long-term remedial approach for all areas and monitoring wells not undergoing active remediation.

MONITORING PROGRAMS

23. Groundwater monitoring at the refinery is performed to achieve multiple objectives as described below. As described in Finding 4, the SMP contained in WDR Order No. R2-2015-0046 remains in effect and applies to both the detection monitoring required by the 2015 WDRs and the corrective action monitoring required by SCR Order No. R2-2006-0065. The SMP contained in WDR Order No. R2-2015-0046 applies to this Order. Should updates to the SMP become necessary, Task 9 provides for those updates as needed. The two primary elements of the SMP (detection monitoring and corrective action monitoring) are described in Findings 24 and 25.
24. Detection Monitoring Program (DMP): The purpose of this program is to monitor groundwater downgradient of WMUs to identify, as early as possible, a potential release to groundwater. The waste materials in each WMU have been evaluated to identify constituents with the potential to contaminate groundwater and to produce a list of COCs, which are monitored once every five years, and Monitoring Parameters (MPs), which are the most mobile constituents and are therefore monitored more frequently.
25. Corrective Action Monitoring Program (CAMP): The purpose of this program is to monitor historical spills that have impacted groundwater, to evaluate the effectiveness of remedial actions that have been implemented, and to ensure that contamination is not migrating away from an impacted area. Corrective action monitoring tracks the concentrations of known groundwater contaminants over time to evaluate the effectiveness of corrective actions.

The AOCs and the WMUs that have known releases to groundwater (IWS 5 and 8) are evaluated under the CAMP. The evaluation of the data includes applying a Mann-Kendall trend test to evaluate for statistically significant increasing or decreasing trends at a 95% confidence level. The identification of increasing or decreasing trends is a key factor in evaluating effectiveness of the corrective action.

Groundwater wells monitored under the CAMP are organized into the following four geographic areas associated with AOCs (see SMP for figures):

- a. Releases from IWS 5 and IWS 8;
- b. Refinery Groundwater Basin Perimeter (RGBP);
- c. Downgradient Trench Perimeter (DGTP); and
- d. Former PG&E Oleum Power Plant (PG&E OPP).

BASIN PLAN

26. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board (State Water Board), the Office of Administrative Law, and U.S. EPA, where required.

BENEFICIAL USES AND SOURCES OF DRINKING WATER

27. Antidegradation Policy: Title 40 of the Code of Federal Regulations, part 131.12, requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy through State Water Board Resolution 68-16, which is deemed to incorporate the federal antidegradation policy where the federal policy applies. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. This Order is consistent with both the State and federal antidegradation policies because it does not authorize discharge of an increased volume or concentration of waste or otherwise allow degradation of existing water quality.

28. State Water Board Resolution No. 88-63: The Basin Plan provides that all groundwater in the Region is considered suitable, or potentially suitable, for municipal or domestic water supply and that, in making any exceptions, the Water Board will consider the criteria referenced in State Water Board Resolution No. 88-63, "Sources of Drinking Water," where:

- i) The total dissolved solids exceed 3,000 mg/l (5,000 μ S/cm, electrical conductivity), and it is not reasonably expected by the Water Board that the groundwater could supply a public water system, or
- ii) There is contamination, either by natural processes or human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using best management practices or best economically achievable treatment practices, or
- iii) The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day (gpd).

29. The refinery is not located in a designated groundwater basin. There is no existing or planned use of groundwater as a source of drinking water at the refinery. However, groundwater at the refinery must be considered for future use as drinking water, which shall be considered in the development of cleanup standards and water quality protection standards (WQPS).

Groundwater does have the potential to discharge into San Pablo Bay. Therefore, the surface water beneficial uses named in the Basin Plan for that water body are applicable to groundwater in POC monitoring wells.

30. The existing and potential beneficial uses of surface water in San Pablo Bay are:

- a. Ocean, commercial, and sport fishing;
- b. Shellfish harvesting;
- c. Estuarine habitat;
- d. Fish migration;
- e. Preservation of rare and endangered species;
- f. Fish spawning;
- g. Wildlife habitat;
- h. Water contact recreation;
- i. Non-contact water recreation;
- j. Industrial service supply; and
- k. Navigation.

31. The existing and potential beneficial uses of groundwater are:

- a. Industrial process and service supply;
- b. Agricultural water supply; and
- c. Municipal and domestic supply.

CLEANUP AUTHORITY

32. State Water Board Resolution No. 92-49: State Water Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under California Water Code Section 13304," establishes policies and procedures to be used by the Water Board when:

- Determining when a person is required to investigate, cleanup, or abate a discharge;
- Concurring with a discharger's selection of cost-effective investigation and remedial measures;
- Overseeing implementation of investigation and remedial measures; and
- Determining schedules for investigation and remedial measures.

This Order implements and is consistent with Resolution No. 92-49.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

33. This Order requires continued monitoring, groundwater extraction, and preparation of work plans and reports that do not have the potential for significant impacts on the environment. As such, the general rule that the California Environmental Quality Act (CEQA) only applies to

projects that have the potential for causing a significant effect on the environment (the “common sense” exemption) applies, and no environmental document needs to be prepared in connection with the adoption of this Order [CCR title 14, section 15061(b)(3)]. When a specific cleanup proposal is submitted to the Executive Officer for approval, such proposal must and will be evaluated under CEQA prior to approval. This Order requires the Discharger to perform investigation activities, continue site monitoring and maintenance activities, and complete minor modifications of the existing groundwater containment system. In addition, this action is an order pertaining to an existing facility. There is no expansion of use beyond that existing under prior orders. For these reasons, the project is exempt from the application of CEQA pursuant to CCR title 14, sections 15301, 15302, 15304, 15309, and/or 15330.

NOTICE AND MEETING

34. The Water Board has notified the Discharger and interested agencies and persons of its intent to issue this Order and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

35. The Water Board, at a public meeting, heard and considered all comments pertaining to this issuance of SCRs.

IT IS HEREBY ORDERED, pursuant to CWC section 13304 and 13267, that the Discharger (or its agents, successors, or assignees) shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner that will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further migration of pollutants through subsurface transport to waters of the State beyond the perimeter groundwater extraction trenches and recovery wells is prohibited.
3. There shall be no discharge of wastes or hazardous substances to surface waters except as permitted under the refinery’s current NPDES permits.
4. Activities associated with the subsurface investigation and cleanup shall not cause significant adverse migration of wastes or hazardous substances.
5. The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in CWC section 13050(m).
6. The Discharger shall not cause the following conditions to exist in waters of the State at any place beyond the influence of the groundwater extraction trenches or recovery wells:
 - a. Surface Waters
 - i. Floating, suspended, or deposited macroscopic particulate matter or foam;
 - ii. Bottom deposits or aquatic growth;

- iii. Adversely altered temperature, turbidity, or apparent color beyond natural background levels (other than that permitted and allowed under the refinery's current NPDES permit);
 - iv. Visible, floating, suspended, or deposited oil or other products of petroleum origin; or
 - v. Toxic or other deleterious substances to be present in concentrations or quantities that may cause deleterious effects on aquatic biota, wildlife, or waterfowl or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentrations.
- b. Groundwater
- i. Further degradation of groundwater quality and/or substantial worsening of existing groundwater impacts; and
 - ii. Subsurface migration of pollutants from refinery operations to waters of the State.

B. TASKS

ALL REQUIRED SUBMITTALS MUST BE ACCEPTABLE TO THE EXECUTIVE OFFICER (SEE PROVISION C.1 - COMPLIANCE)

Groundwater Extraction and Hydraulic Containment

1. Phillips 66 shall continue to extract water from the groundwater interceptor trenches and extraction systems that are part of the Refinery Groundwater Basin Perimeter (RGBP) at a rate that eliminates or reverses the migration of contaminants toward San Pablo Bay.

COMPLIANCE DATE: Ongoing

Free-Phase Liquid Petroleum Hydrocarbon (FPLH) Recovery

2. Phillips 66 shall continue to perform recovery activities, as needed, to remove FPLH from groundwater if found in significant and recoverable quantities during routine groundwater monitoring. FPLH recovery may be necessary to reduce the source of dissolved constituents that are introduced via the free-phase.

COMPLIANCE DATE: Ongoing

Main Interceptor Trench (MIT) Alignment C Extension Completion Report

3. The Discharger shall submit a completion report for the construction and startup of the extension to MIT Alignment C that was completed in 2017. This extension is designed to prevent migration of contaminants using total fluids extraction wells. The report shall include an evaluation of the initial system effectiveness and indicate whether any modifications to the SMP are necessary.

COMPLIANCE DATE: September 28, 2018

A-E Gap Hydraulic Containment System Completion Report

4. The Discharger shall submit a completion report for the construction and startup of the hydraulic containment system, which is nearly complete. The system is designed to prevent migration of contaminants through the gap between MIT Alignment A and Alignment E, where

the gap is due to presence of an active railroad corridor. The report shall include an evaluation of the initial system effectiveness and indicate whether any modifications to the SMP are necessary.

COMPLIANCE DATE: September 30, 2019

Operations and Maintenance Plan for the Groundwater Remediation Systems

5. The Discharger shall submit an operations and maintenance plan for the groundwater remediation systems, including the hydraulic containment systems and FPLH recovery systems. The plan shall describe performance goals (e.g., prevent migration of contaminants), performance measures and methods by which performance goals will be verified, and inspection/monitoring methods and frequencies to ensure equipment is in satisfactory condition and properly operating. A description of operation and maintenance activities and results shall be included in the self-monitoring reports.

COMPLIANCE DATE: 60 days after approval by the Executive Officer of Task 4 above.

Area 6 FPLH Recoverability Evaluation Report

6. The Discharger shall submit a report describing the installation of monitoring wells within Area 6 to collect samples of FPLH and the results of analyses regarding FPLH mobility and recoverability. The report include an evaluation of the feasibility of FPLH recovery in Area 6.

COMPLIANCE DATE: July 31, 2019

Tar Seep Area Investigation Report

7. The Discharger shall submit a report describing the implementation of the May 4, 2017, Tar Seep Mitigation Work Plan. The report shall describe the buried cylindrical metal objects containing semi-solid petroleum hydrocarbons discovered during implementation of the mitigation work plan, document the location of the objects, and include a recommendation(s) and schedule for next steps.

COMPLIANCE DATE: September 28, 2018

Spill Reporting and Documentation of Cleanup

8. The Discharger shall notify the Water Board of any reportable quantity (42 gallons or more) of petroleum that is either spilled or leaked to any unlined ground surface (any surface not protected by a barrier that is impermeable to petroleum products or other constituents that may cause adverse water quality impacts). Verbal notification shall be provided within one working day of discovery of the spill and shall be followed by a written description to include the nature, location, and volume of the spill and the total area and/or soil volume affected. In addition, the written report shall include a map that identifies the location of the spill and photographic documentation of the spill area before and after cleanup.

COMPLIANCE DATE: Verbal notification within 24 hours after discovery written notification within five working days after discovery

Update Groundwater Self-Monitoring Program

9. The Discharger shall review the Self-Monitoring Program (SMP) attached to WDR Order No. R2-2015-0046 and propose any necessary updates to incorporate new groundwater monitoring wells, extraction systems, and/or sampling parameters/frequency. All sampling protocols and reporting requirements shall be consistent with those described in the SMP. As part of the update, all historical monitoring well data (from at least the most recent five-year period) shall be evaluated, a determination made about adequacy of the number of point of compliance wells, and compliance timelines added for any future corrective action that may be needed.

COMPLIANCE DATE: As needed

Update Water Quality Protection Standards (WQPS)

10. As appropriate, the Discharger shall update existing WQPS (in the SMP attached to WDR Order No. R2-2015-0046) in accordance with either federal or State regulations or guidelines, or with technically-justified site-specific standards, acceptable to the Executive Officer. The WQPS shall consist of the list of constituents of concern, the concentration limits, and the Points of Compliance and all Monitoring Points.

COMPLIANCE DATE: As needed

C. PROVISIONS

1. Compliance: The Discharger shall comply immediately, or as prescribed by the time schedule contained herein, with all Prohibitions, Tasks, and Provisions of this Order. All required submittals must be acceptable to the Executive Officer. Violations may result in enforcement actions, including Water Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of this Order by the Water Board.
2. Authority to Request Technical Reports: All technical and monitoring reports required by this Order are requested pursuant to CWC section 13267. Failure to submit reports in accordance with schedules established by this Order or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer may subject the Discharger to enforcement action pursuant to CWC section 13268.
3. All technical reports submitted pursuant to this Order shall be prepared under the supervision of and signed by a California registered civil engineer or a California professional geologist.
4. At any time, the Discharger may file a written request (including supporting documentation) with the Executive Officer, proposing modifications to the SMP. If the proposed modifications are acceptable, the Executive Officer may issue a letter of approval that incorporates the proposed revisions into the SMP.
5. Modifications to Remedial Action Plan: The Discharger shall notify and get approval from the Executive Officer at least 60 days prior to implementing any proposed major modifications to any approved Remedial Action Plan, Implementation Schedule, or remediation system. The notification shall include the rationale for any proposed modification.

6. Delayed Compliance: If the Discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the tasks, the Discharger shall promptly notify the Executive Officer of the delay and reason for the delay, and the Water Board may consider revisions to this Order.
7. Operation and Maintenance (O&M): The Discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this order.
8. Availability: A copy of this Order shall be maintained by the Discharger and shall be made available by the Discharger to all employees or contractors performing work necessary to comply with the tasks set forth in this Order.
9. Change in Ownership: In the event of any change in control or ownership of the facility presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Water Board upon a final change in ownership.

COMPLIANCE DATE: 30 days after a change in site control or ownership

10. Stormwater: The Discharger shall comply with the provisions of the refinery's current NPDES permits for the management, monitoring, and discharge of stormwater runoff.
11. Reporting of Hazardous Substance Release: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it probably will be discharged in or on any waters of the State, the Discharger shall:
 - a. Report such discharge to the following:
 - i. The Water Board by calling (510) 622-2369 during regular office hours (Monday through Friday, 8 a.m. – 5 p.m.); and to
 - ii. The California Office of Emergency Services at (800) 852-7550.
 - b. A written report shall be filed with the Water Board within five working days. The report shall describe:
 - i. The nature of the waste or pollutant.
 - ii. The estimated quantity involved.
 - iii. The duration of the incident.
 - iv. The cause of the release.
 - v. The estimated size of the affected area and nature of the effect.
 - vi. The corrective actions taken or planned and a schedule of those measures.
 - vii. The persons/agencies notified.

This reporting is in addition to any reporting to the California Office of Emergency Services that is required pursuant to the Health and Safety Code.

12. Lab Qualifications: All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Water Board using approved U.S. EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Water Board review. This provision does not apply to analyses that can only reasonably be performed onsite (e.g., temperature, pH).
13. Document Distribution: Copies of all correspondence, technical reports, and other documents submitted in compliance with this Order shall be provided to the Water Board.
14. Submittal Revisions: Where the Discharger becomes aware of a material error in fact or omission in any report previously submitted to the Water Board, it shall promptly submit such facts or information. [CWC sections 13260 and 13267]
15. Severability: Provisions of this Order are severable. If any provisions of this Order are found invalid, the remainder of these Requirements shall not be affected. [CWC 9213]
16. GeoTracker Requirements: The State Water Board has adopted regulations requiring electronic report and data-submittal to GeoTracker. The text of the regulations can be found at the following URL:

http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/index.shtml

Parties responsible for cleanup of pollution at sites overseen by the Water Board are required to submit the following information electronically to GeoTracker:

- a. Groundwater analytical data;
- b. Surveyed locations of monitoring wells;
- c. Boring logs describing monitoring well construction; and
- d. Portable data format (PDF) copies of all reports (the document in its entirety [signature pages, text, figures, tables, etc.] must be saved as a single PDF file).

Note that the Discharger is still responsible for submitting one hard copy of all reports pursuant to this Order, unless otherwise agreed upon. The Water Board may require direct submittal of electronic reports and correspondence in addition to the State Water Board's GeoTracker requirements.

17. Entry and Inspection: The Discharger shall allow the Water Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:
 - a. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

- d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order or as otherwise authorized by the CWC, any substances or parameters at any location.
18. Maintenance of Records: The Discharger shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Executive Officer. Records of monitoring information shall include:
- a. The date, exact place, and time of sampling or measurements;
 - b. The individuals who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. The individuals who performed the analyses;
 - e. The analytical techniques or method used; and
 - f. The results of such analyses.
19. Report Certification: All application reports or information to be submitted to the Executive Officer shall be signed and certified as follows:
- a. For a corporation – by a principal executive officer or the level of vice president.
 - b. For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.
 - c. For a municipality, State, federal, or other public agency – by either a principal executive officer or ranking elected official.

A duly authorized representative of a person designated in this provision may sign documents if all of the following are met:

- a. The authorization is made in writing by a person described in paragraph (a) of this provision;
- b. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
- c. The written authorization is submitted to the Executive Officer.

Any person signing a document under this Provision shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.” [CWC sections 13263, 13267, and 13268]

20. Cost Recovery: The Discharger (as applicable) shall be liable, pursuant to CWC section 13304 and Health and Safety Code section 25270.9, to the Water Board for all reasonable costs actually incurred by the Water Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Water Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and

according to the procedures established in that program. Any disputes raised by the Discharger (as applicable) over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

21. Periodic Site Cleanup Requirements (SCR) Order Review: The Water Board will review this Order periodically and may revise it when necessary. The Discharger (as applicable) may request revisions, and, upon review, the Executive Officer may recommend that the Water Board revise these requirements.

22. This Order rescinds and supersedes SCR Orders No. R2-2006-0065 and No. R2-2012-0081

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on April 11, 2018.

Bruce H. Wolfe
Executive Officer

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Compliance Notice: Failure to comply with the requirements of this Order may subject you to enforcement action, including but not limited to imposition of administrative civil liability under Water Code sections 13268 or 13350, or referral to the Attorney General for injunctive relief or civil or criminal liability.
=====

Figures:

Figure 1 – Site Location

Figure 2 – Site Plan

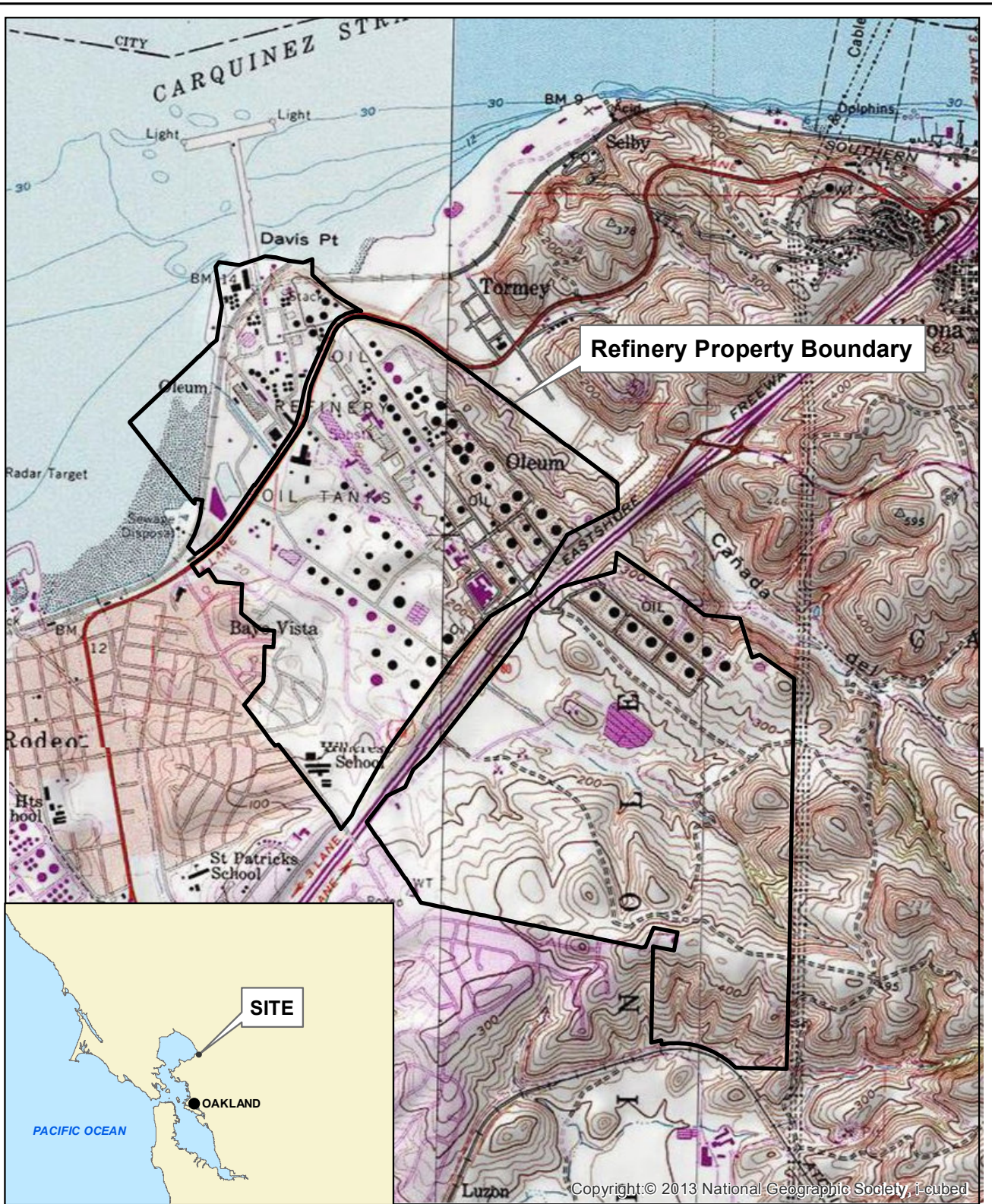
Figure 3 – Groundwater Flow Direction

Figure 4 – Location of Waste Management Units

Figure 5 – Location of Corrective Action Areas

Figure 6 – Corrective Action Free-Phase Liquid Petroleum Hydrocarbon (FPLH) Recovery Program Areas

Figure 7 – Location of Site Cleanup Requirements Task Areas



Refinery Property Boundary

SITE



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SOURCE: USGS 7.5' QUAD SHEET
BENICIA & MARE ISLAND, CA
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FIGURE 1

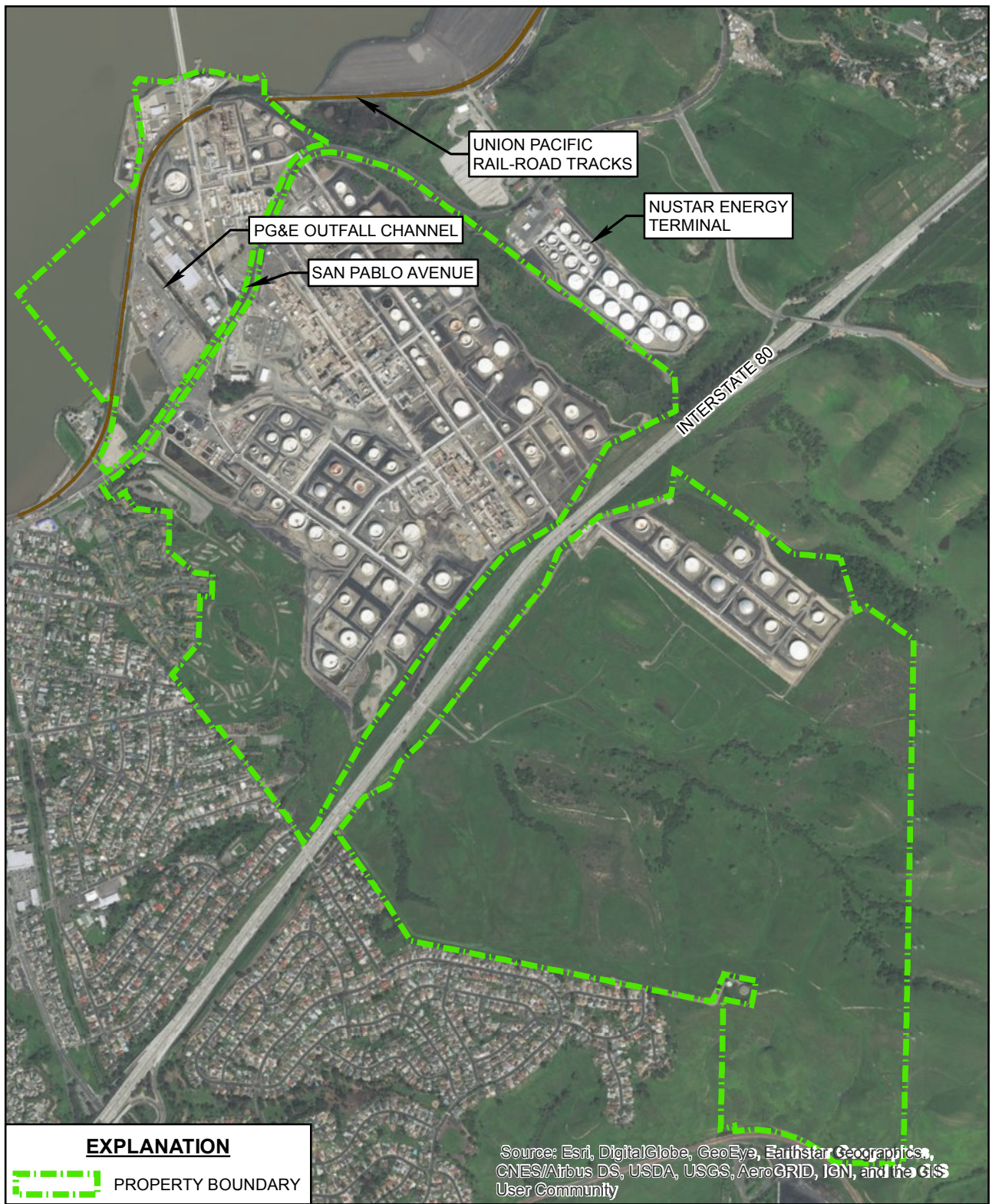
SITE LOCATION

**PHILLIPS 66
SAN FRANCISCO REFINERY
RODEO, CALIFORNIA**

Drawn By: DH	Checked By: JC	Scale: 1" = 2,000'	Date: 2/8/18	File: Fig1_SCR_SiteLoc.mxd
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MICHEVRON.CMC_COP/RODEO/IGIS/PROJECTS/GROUNDWATER_REPORTS/SCOPE/BUDGET/201802_SCR-REVISION/FIG1_SCR_SITELOC.MXD

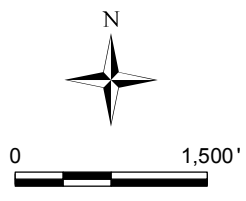
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EXPLANATION

 PROPERTY BOUNDARY

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



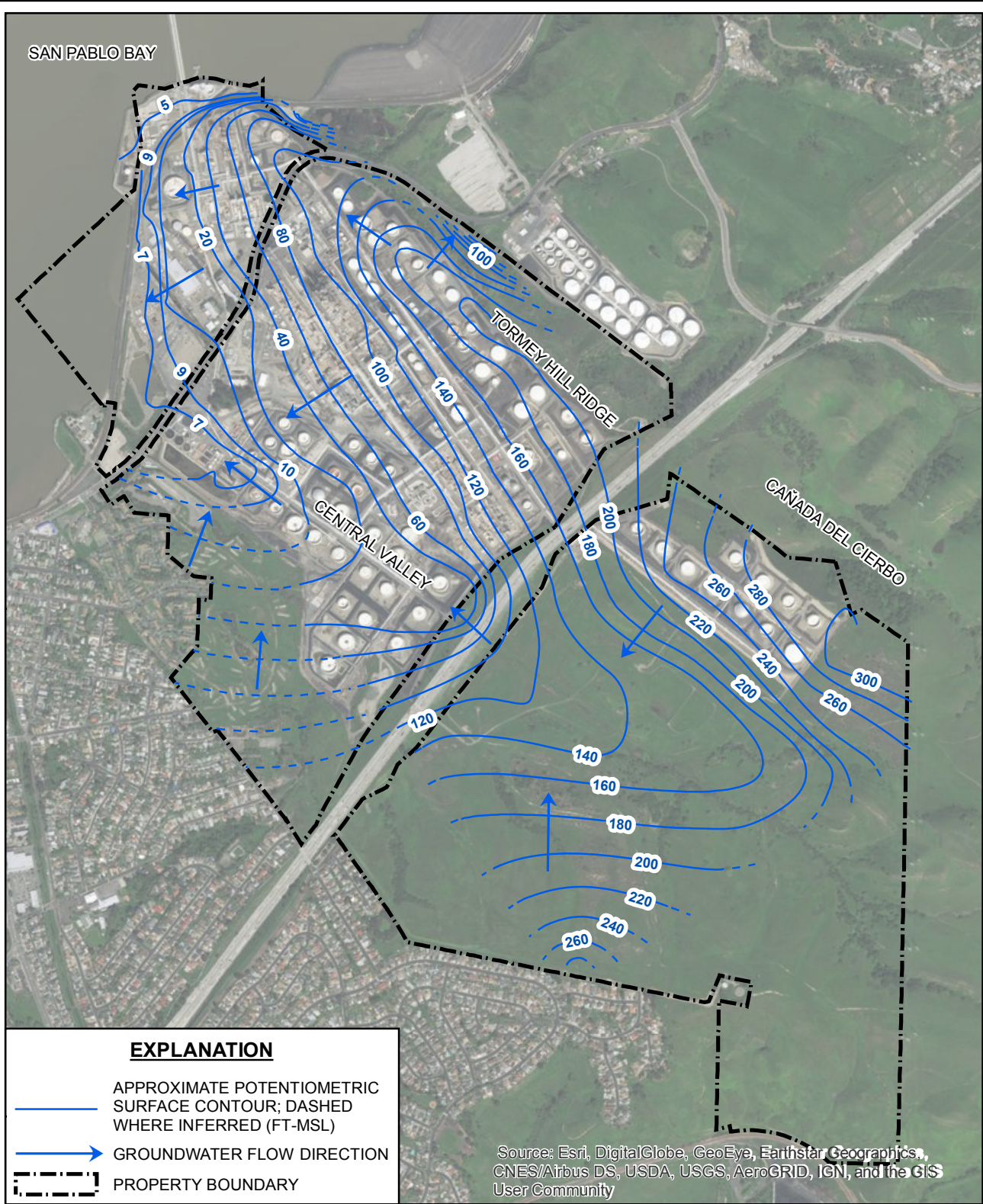

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FIGURE 2

SITE PLAN

PHILLIPS 66
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RODEO, CALIFORNIA

Drawn By: DH	Checked By: JC	Scale: 1" = 1,500'	Date: 2/14/18	File: Fig2_SCR_SitePlan.mxd
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EXPLANATION

- APPROXIMATE POTENTIOMETRIC SURFACE CONTOUR; DASHED WHERE INFERRED (FT-MSL)
- GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARY

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



0 1,500'

NOTE:
FT MSL = FEET MEAN SEA LEVEL

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FIGURE 3

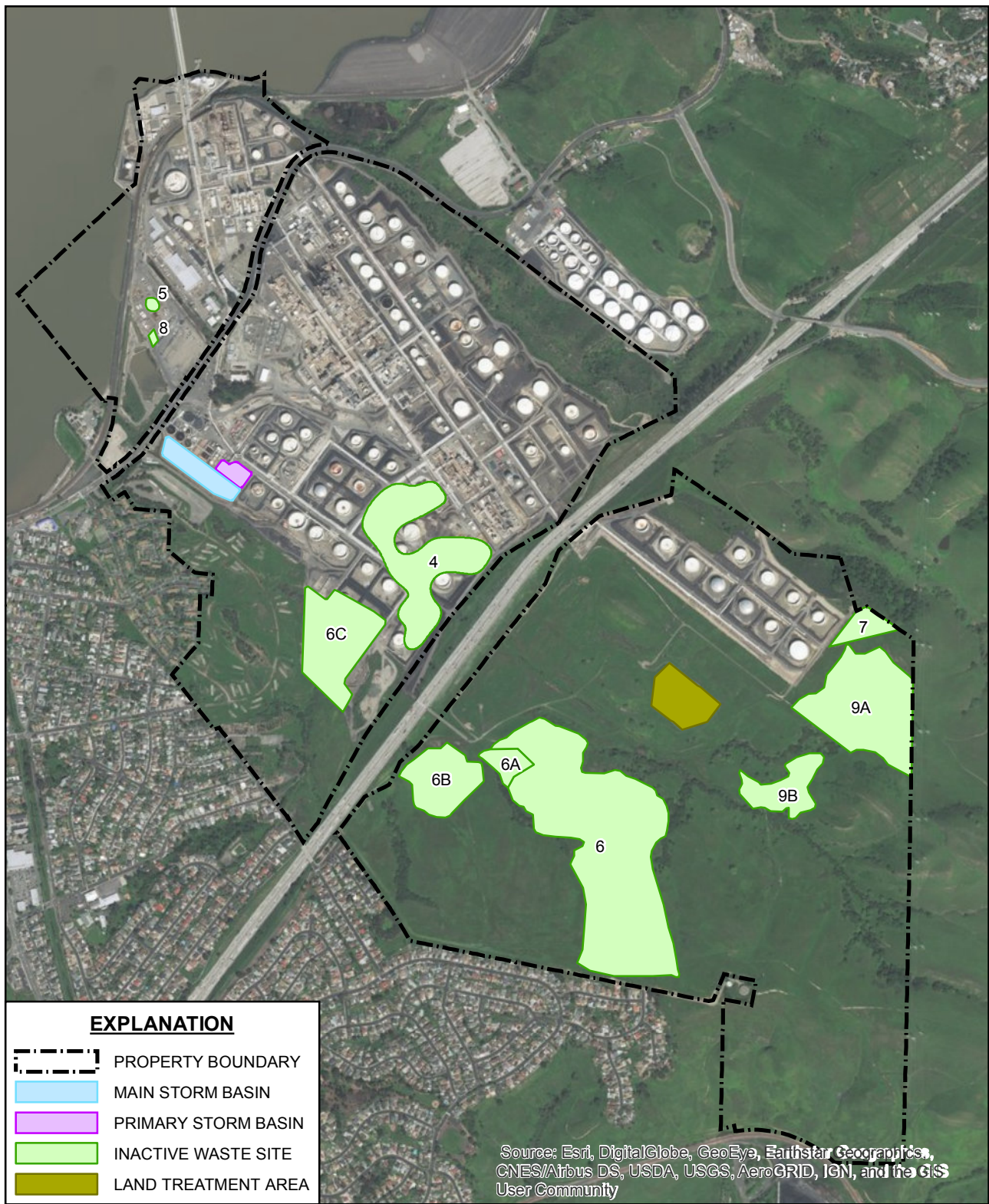
GROUNDWATER FLOW DIRECTION

**PHILLIPS 66
SAN FRANCISCO REFINERY
RODEO, CALIFORNIA**


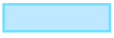
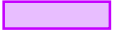


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M:\CHEVRON\CHEM_CO\PRODEO\GIS\PROJECTS\GROUNDWATER_REPORTS\SCOPE\BUDGET\201802_SCR-REVISION\FIG3_SCR_GW_FLOW.MXD

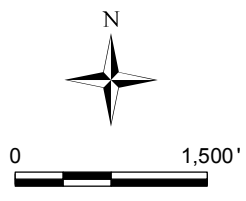
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EXPLANATION

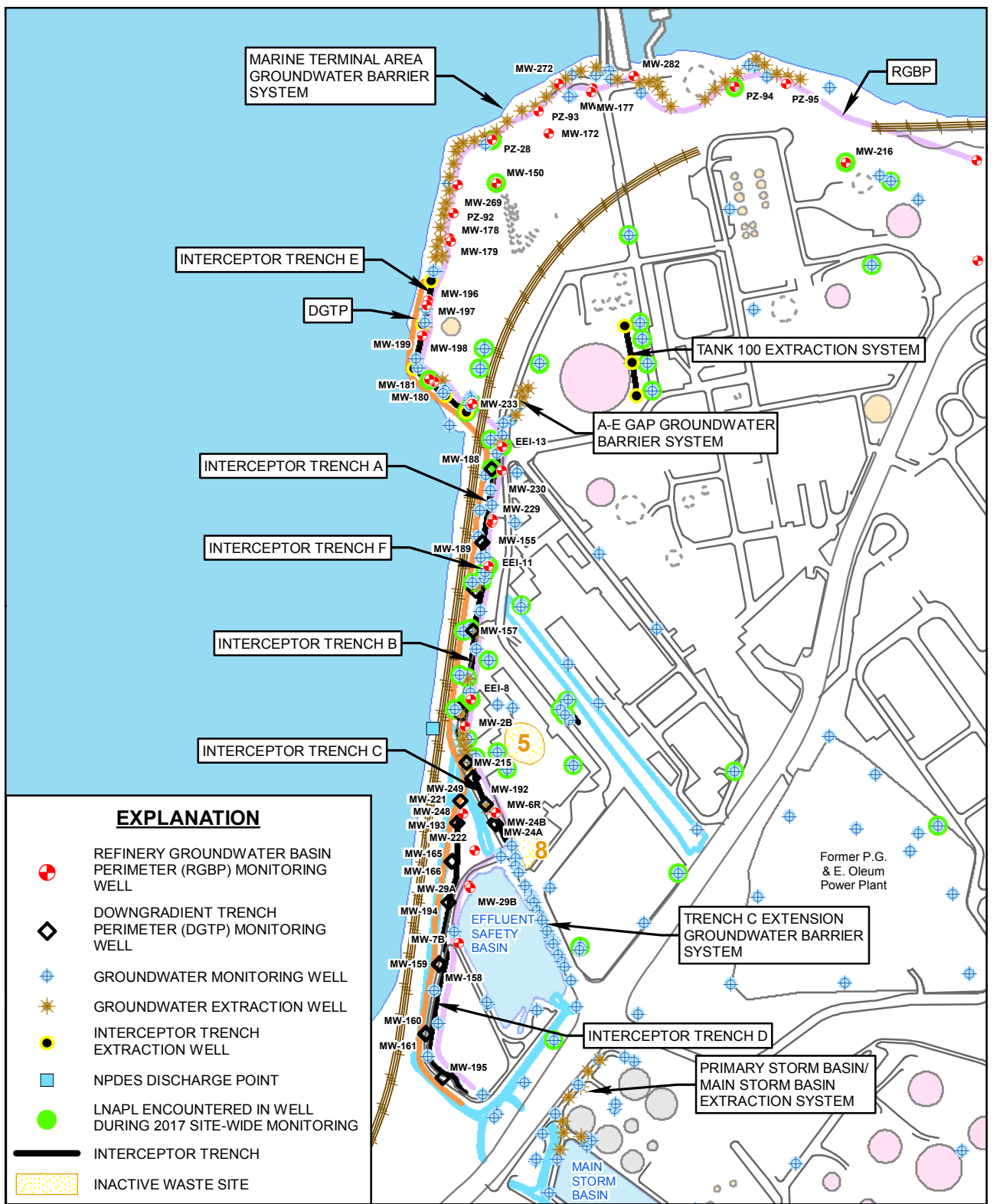
-  PROPERTY BOUNDARY
-  MAIN STORM BASIN
-  PRIMARY STORM BASIN
-  INACTIVE WASTE SITE
-  LAND TREATMENT AREA

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community




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FIGURE 4				
LOCATION OF WASTE MANAGEMENT UNITS				
PHILLIPS 66 SAN FRANCISCO REFINERY RODEO, CALIFORNIA				
Drawn By: DH	Checked By: JC	Scale: 1" = 1,500'	Date: 2/14/18	File: Fig4_SCR_WMUs.mxd



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EXPLANATION

- ⊕ REFINERY GROUNDWATER BASIN PERIMETER (RGBP) MONITORING WELL
- ◇ DOWNGRAIDENT TRENCH PERIMETER (DGTP) MONITORING WELL
- ⊕ GROUNDWATER MONITORING WELL
- ★ GROUNDWATER EXTRACTION WELL
- INTERCEPTOR TRENCH EXTRACTION WELL
- NPDES DISCHARGE POINT
- LNAPL ENCOUNTERED IN WELL DURING 2017 SITE-WIDE MONITORING
- INTERCEPTOR TRENCH
- INACTIVE WASTE SITE

FIGURE 5

LOCATION OF CORRECTIVE ACTION AREAS

**PHILLIPS 66 SAN FRANCISCO REFINERY
RODEO, CALIFORNIA**

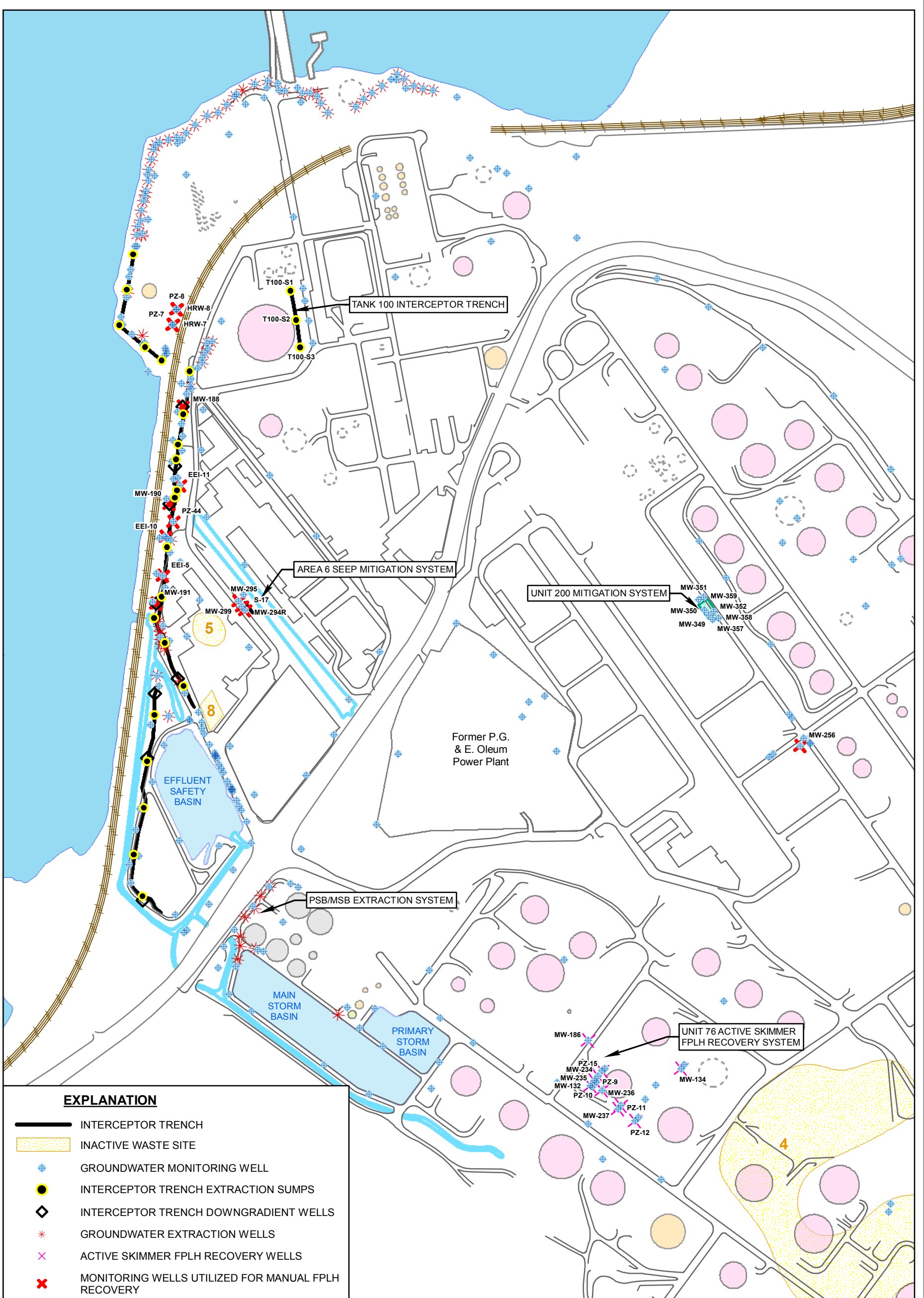


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

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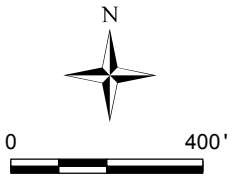
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EXPLANATION

-  INTERCEPTOR TRENCH
-  INACTIVE WASTE SITE
-  GROUNDWATER MONITORING WELL
-  INTERCEPTOR TRENCH EXTRACTION SUMPS
-  INTERCEPTOR TRENCH DOWNGRAIENT WELLS
-  GROUNDWATER EXTRACTION WELLS
-  ACTIVE SKIMMER FPLH RECOVERY WELLS
-  MONITORING WELLS UTILIZED FOR MANUAL FPLH RECOVERY



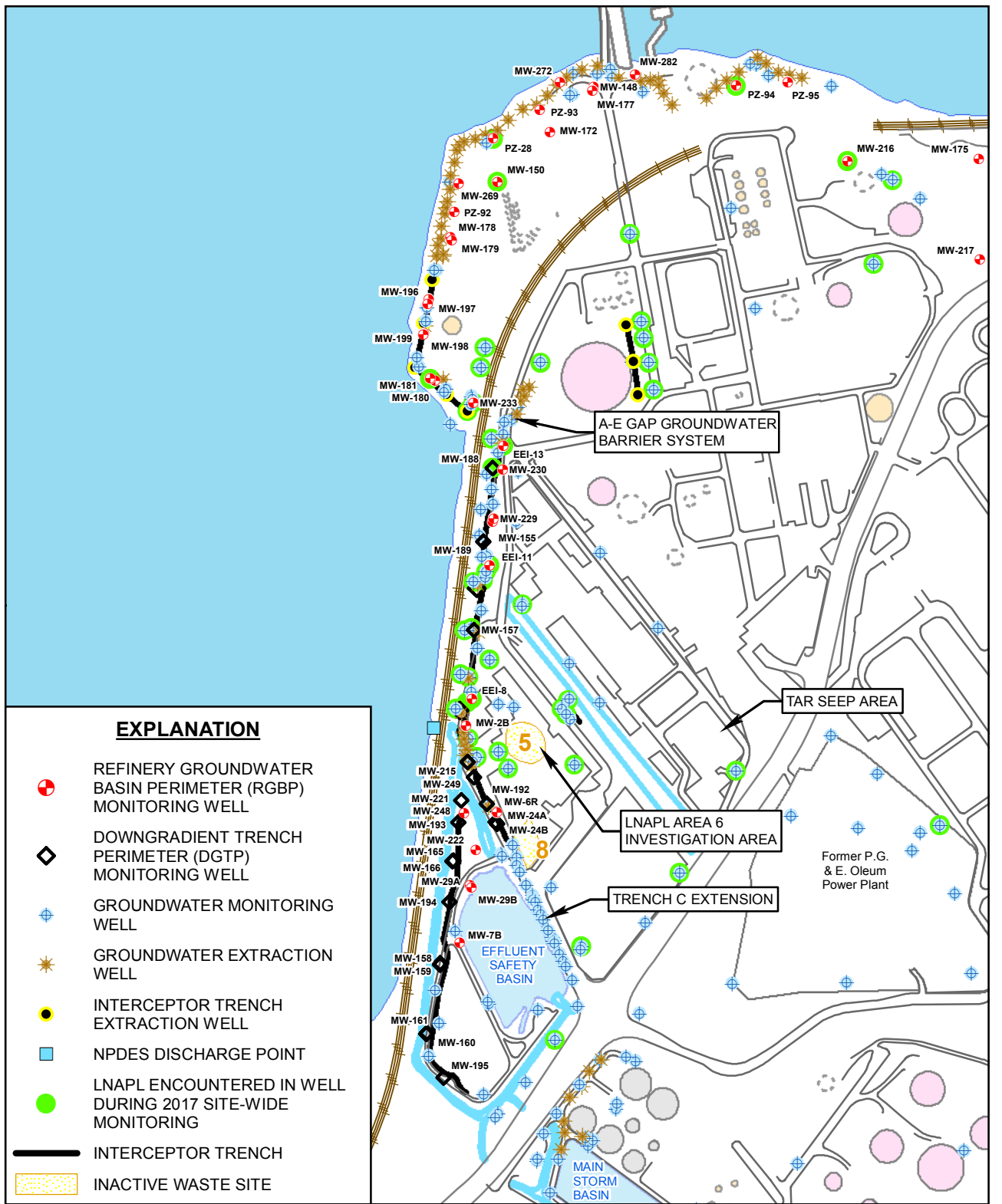
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FIGURE 6
CORRECTIVE ACTION FREE-PHASE LIQUID
PETROLEUM HYDROCARBON (FPLH)
RECOVERY PROGRAM AREAS

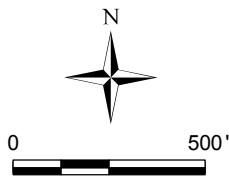
PHILLIPS 66 SAN FRANCISCO REFINERY
RODEO, CALIFORNIA

M:\CHEVRON\CEMC_COPIRODEO\GIS\PROJECTS\GROUNDWATER_REPORTS\SCOPE\BUDGET\201802_SCR-REVISION\FIG7_SCR_CA_TASKAREAS.MXD



EXPLANATION

- ⊕ REFINERY GROUNDWATER BASIN PERIMETER (RGBP) MONITORING WELL
- ◇ DOWNGRADE TRENCH PERIMETER (DGTP) MONITORING WELL
- ⊕ GROUNDWATER MONITORING WELL
- ★ GROUNDWATER EXTRACTION WELL
- INTERCEPTOR TRENCH EXTRACTION WELL
- NPDES DISCHARGE POINT
- LNAPL ENCOUNTERED IN WELL DURING 2017 SITE-WIDE MONITORING
- INTERCEPTOR TRENCH
- INACTIVE WASTE SITE



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FIGURE 7

LOCATION OF SITE CLEANUP REQUIREMENTS TASK AREAS

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