

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2019-0713
FOR
UNION PACIFIC RAILROAD COMPANY
DUNSMUIR RAILYARD, NORTH FUELING FACILITY
5750 SACRAMENTO AVENUE
DUNSMUIR, CALIFORNIA
SISKIYOU COUNTY

This Order is issued to Union Pacific Railroad Co. (Responsible Party or UPRR) pursuant to Water Code section 13304, which authorizes the Central Valley Regional Water Quality Control Board (Central Valley Water Board) to order the cleanup and abatement of wastes associated with unauthorized releases from the Dunsmuir Railyard, North Fueling Facility (Site or Railyard); and Water Code section 13267, which authorizes the Central Valley Water Board to require the preparation and submittal of technical and monitoring reports.

FINDINGS

With respect to the above-designated Responsible Party, the Executive Officer of the Central Valley Water Board finds as follows:

Site Ownership and Operations

1. The Dunsmuir Railyard, North Fueling Facility (Railyard or Site) is located in the northeast quarter of Section 25, Township 29 North, Range 4 West (Mount Diablo Base and Meridian). The Railyard is defined by a north-south oriented railyard right-of-way that is approximately 2,100 feet long. The Railyard is located between Sacramento Avenue and the Sacramento River. The Railyard has been designated by the California State Board of Equalization (BOE) as Assessed Property Number 872-47-1J, Parcel 7. A detailed Site map is provided on **Attachment A**, which is incorporated herein.
2. Southern Pacific Transportation Co. (SPTC) owned the Railyard until August 1996 when it was purchased by UPRR. The BOE has confirmed that UPRR is the current owner of the Railyard.
3. The Railyard has been in operation since the early 1900s and remains an active facility. Steam locomotives were maintained and fueled at the Railyard until the 1950s, after which diesel-electric locomotives were maintained and fueled at the Railyard. Most fuel storage and fueling of diesel-electric locomotives were discontinued at the Railyard in 2003. A vehicle wash rack and a 1,000-gallon double-walled diesel fuel aboveground storage tank (AST) remain in use at the Railyard.
4. The historical Bunker C fueling system, located in the northern part of the Site, included an AST, a pump house, and several oil sumps. Bunker C fuel oil was delivered to the Site in tank cars, stored in the AST, and dispensed in steam-heated conveyances.

Around 1955, the 2.1-million-gallon Bunker C fuel oil AST was replaced by a 200,000-gallon diesel fuel AST, at approximately the same location. Diesel fuel was delivered to the Site in tank cars which also served as storage tanks; diesel fuel was dispensed through a pressurized system.

5. Historical operations have resulted in the release of unknown quantities of Bunker C fuel oil and diesel oil, which have migrated to the vadose zone, groundwater, and to the Sacramento River. Sources of the oil include spills or leakage from locomotives, storage tanks, conveyance pipelines, maintenance and repair activities, and other fuel handling areas at the Site.

Site Description

6. The Site is relatively flat because of fill material that was placed in the eastern half of the Site. The eastern edge of the Site is approximately 15 to 20 feet above the Sacramento River when bankfull and has been stabilized by sections of riprap and concrete and wooden retaining walls. A concrete walkway borders the Sacramento River at the base of the retaining wall. The sidewalk is approximately 3 to 5 feet above channel-flow in the Sacramento River during the dry season and is submerged during flood stage.
7. The Site is underlain by areas with up to 15 feet of nonnative fill, consisting of soil, bricks, concrete, scoria, wood, and cinders, overlying river channel deposits (alluvium) which in turn overlie bedrock. Ranging from 20 to 30 feet thick, the alluvium consists of silt, sand, gravel, cobbles, and boulders and generally becomes coarser grained with increasing depth. The upper portion of bedrock generally consists of highly fractured volcanic gravel, cobbles, and boulders conglomerate within a matrix of sand and ash at various degrees of induration (cementation). Moderately to intensely fractured gabbrodiorite underlies the conglomerate, except in the northwestern edge of the Site where basalt underlies the conglomerate. The transition between conglomerate and gabbrodiorite is at depths of approximately 30 to 40 feet below ground surface (bgs) in the southern portion of the Site and at depths of more than 72 feet bgs in the central portion of the Site.
8. The upper groundwater zone consists of saturated alluvium and fill. The upper groundwater zone is unconfined and its continuity with the underlying bedrock units is unknown. Depth to groundwater in the upper groundwater zone ranges from approximately five to 17 feet bgs. Groundwater levels fluctuate seasonally by at least 8 feet in response to precipitation events and river stage. The upper groundwater zone has a saturated thickness of approximately 10 feet and has a hydraulic conductivity of approximately 34 to 43 feet per day. The groundwater gradient is primarily south-southeasterly and ranges from 0.005 feet per foot (ft/ft) in the northern portion of the Site to 0.02 ft/ft in the southern portion of the Site. Estimates of groundwater velocity at the Site range from 38 to 80 feet per day.

Site Background

1920-1994

9. In 1920, SPTC installed a 664-foot long concrete retaining wall and an oil sump along the Sacramento River to intercept fuel oil discharging to the river.
10. In 1951, because of the observation of oil in the Sacramento River, SPTC constructed a second 630-foot long “coffer” wall parallel to the original wall at a lower elevation and slightly above the water surface at the low river stage. The space between the two walls was intended to serve as an oil trap. The downstream end of the oil trap was equipped with baffles and excelsior pads to retain the trapped oil. In 1971, the oil trap was cleaned and filled with concrete. A series of 33 vertical steel “grout” pipes (P-1 through P-33) were installed in the concrete, which have periodically been used to remove fuel oil from beneath the concrete.
11. In 1971, SPTC installed a groundwater extraction and treatment system (GWETS) to control migration of fuel oil (also known as non-aqueous phase liquid or “NAPL”) in the central and southern portions of the Site. The system was also used to process industrial wastewater from underground drain systems associated with the Railyard’s turntable and fueling system. The GWETS included eight extraction wells located on the southern end of the property, a curtain drain adjacent to and parallel to the Sacramento River, a surge pond, an oil-water separator (OWS), and a subsurface leach field. The discharge to the leach field was regulated under multiple National Pollutant Discharge Elimination System (NPDES) permits between 1984 and 1992 when it was shut down.

Initially, the oil-contaminated water was directed to a surge pond where oil was skimmed off the top of the pond and the water was passed through an oil/water separator before discharge to the subsurface leach field. The surge pond was closed in 1987 to comply with the Toxic Pits Cleanup Act (TPCA). The replacement system, consisting of an aboveground tank with a surface skimmer, was unable to adequately treat the discharge and the leach field did not have adequate capacity to contain the full volume of discharge. Overflow was directed to the Railyard’s turntable pit which, in turn, discharged directly to the Sacramento River in violation of waste discharge requirements. Site inspections revealed the system was often in disrepair or not in full operation. The failure to operate the system adequately resulted in several instances of the discharge of oil to the upper Sacramento River in violation of waste discharge requirements. As a result, the system was shut down in 1992.

12. In 1987, CH2M Hill (SPTC’s consultant) prepared the *Hydrogeological Assessment Report, Southern Pacific Transportation Company, Dunsmuir Yard, Dunsmuir, California* in response to a Central Valley Water Board request to address TPCA requirements for abandonment of the surge pond associated with the GWETS. In 1988, liquid and sludge in the pond were removed and the pond was closed in accordance with TPCA requirements.

13. In 1991, OHM Corporation, consultant to SPTC, conducted emergency response activities to address seepage of oily material along the retaining wall adjacent to the Sacramento River. Water and NAPL had accumulated over time and were present within the grout pipes. OHM Corporation summarized the activities in *Summary of Environmental Response Activities, Dunsmuir, California*, dated March 1991. Activities included collecting seepage samples for NAPL, characterization of the NAPL, completing an elevation survey, and developing and implementing a protocol to periodically pump the grout tubes.
14. In 1991, Industrial Compliance, consultant to SPTC, conducted a preliminary site characterization study to identify appropriate remedial methods to prevent or minimize the potential for future environmental impacts at the Site. Industrial Compliance presented the investigation findings in the March 1991 *Preliminary Site Characterization of the Dunsmuir Railroad Yard, Dunsmuir, California*. The investigation findings indicated that NAPL was widely distributed across the Site. Two areas of elevated total petroleum hydrocarbon (TPH) concentrations were identified, one in the area of the former ASTs and a second area in the east-central portion of the Site associated with a historical 65,000-gallon oil tank. No volatile organic compounds (VOCs) were detected in soil or groundwater samples. Trace concentrations of semi-volatile organic compounds (SVOCs) were detected. Metals concentrations appeared indicative of background levels.
15. In April 1992, the Central Valley Water Board issued Cleanup and Abatement Order (CAO) 91-735 which required corrective measures to mitigate potential petroleum migration into the Sacramento River. In response, SPTC assessed surface water, groundwater, and hydrogeologic conditions at the Site. The assessment findings were presented in SPTC's *Shallow Groundwater Containment and Treatment at the Southern Pacific Transportation Company Dunsmuir Yard, Remedial Design Report*, dated December 1992. The assessment included: surface water sampling at four locations on the Sacramento River; 11 river bottom sediment samples; 13 floodplain sediment samples; 16 test pits; groundwater monitoring well installation; and aquifer pumping tests. TPH was not detected in the surface water samples. TPH was detected in three floodplain samples and one river bottom sediment sample at concentrations ranging between 35 and 15,000 milligrams per kilogram (mg/kg). Tests pits indicated that the areas of greatest TPH impact were located near the former Bunker C fuel oil AST and along the eastern edge of the Site, near current collection wells CW4 and CW5. The hydrogeologic testing and analysis concluded that groundwater and oil were seeping beneath and through the Site retaining wall.
16. In 1993, SPTC installed a second GWETS to replace the original GWETS. The second system consisted of 18 36-inch diameter collection wells (CW1 through CW18) located on the northern portion of the Site, an 850-foot long interceptor trench located immediately downgradient of the collection wells, and the treatment system located in the central portion of the Site. The interceptor trench was excavated to approximately 4 feet above the elevation of the base of the concrete retaining wall. A liner was installed

along the river side of the interceptor trench, consisting of 40-mil high density polyethylene (HDPE) between two layers of 10-ounce geotextile padding. The collection wells were installed at 50-foot intervals in the lined interceptor trench excavation. The trench was then backfilled with washed river-run rock. The system included a 216,000-gallon storage tank, 8,000-gallon oil tank, 2,000-gallon surge tank, oil/water separator (OWS), media filter (sand), and granular activated carbon (GAC) vessels. The system treated extracted groundwater, and water from the turntable and vehicle wash rack.

Effluent from the treatment system has been discharged to an infiltration gallery adjacent to the Sacramento River under multiple NPDES permits between 1993 and present day. Since 2010, the GWETS has violated 14 NPDES permit conditions, primarily due to elevated lead in GWETS effluent, which has incurred a total of \$39,000 in mandatory minimum penalties.

17. The Central Valley Water Board rescinded the CAO 91-735 on 15 November 1994, after Central Valley Water Board staff (Staff) inspections indicated that SPTC was in compliance with the NPDES permit and the CAO.

2009–Present

18. In October 2009, CH2M Hill cored four locations on the sidewalk adjacent to the Sacramento River. Observations included fluid movement toward the river, a layer of oil on water in the corings, and seepage of oil under the retaining wall and through cracks in the concrete.
19. In January 2010, CH2M Hill further characterized the vertical and lateral extent of TPH in soil and groundwater. CH2M Hill presented the investigation findings in the *Site Investigation Report, North Dunsmuir Rail Yard, Siskiyou County*, dated July 2010. Field observations during the investigation included soil staining and petroleum sheen or odor throughout the soil borings. Analytical results identified TPH with a carbon range of C19 to C36 in soil and groundwater samples. TPH concentrations ranged from 7.6 to 20,000 mg/kg in soil and 60,000 to 1,000,000 micrograms per liter (µg/L) in groundwater.
20. Between 2009 and 2013, UPRR conducted a voluntary groundwater monitoring program to evaluate the groundwater quality beneath the Site. The monitoring program included 11 wells which were analyzed for TPH as diesel (TPHd) and oil-range organics (TPHo). The program included a one-time sampling for polynuclear aromatic hydrocarbons (PAHs) and VOCs, and four quarters of sampling for benzene, toluene, ethylbenzene, and xylenes (compounds collectively known as BTEX). VOCs and PAHs were not detected above laboratory reporting limits. Toluene was the only BTEX compound detected, at concentrations of up to 18 ug/L. TPHd concentrations ranged from 52 to 160,000 ug/L and TPHo concentrations ranged from <100 to 950,000 ug/L.
21. In 2010 and 2011, CH2M Hill conducted a data gap investigation of the Site to further define the extent, characteristics, and magnitude of TPH in soil and groundwater,

determine the NAPL characteristics, evaluate the interaction and influence of the Sacramento River on the Site, evaluate the hydraulic properties of the upper groundwater zone, and update the conceptual site model (CSM). The findings of the investigation are presented in the April 2012 *Data Gap Investigation Dunsmuir Railyard, North Fueling Facility, Dunsmuir, California* (Data Gap Investigation Report).

The findings indicated that NAPL is present throughout the Site and suggested the presence of preferential pathways. TPHd and TPHo concentrations in soil ranged from 2.9 to 13,000 mg/kg and 17 to 22,000 mg/kg, respectively; the highest concentrations were detected at depths of 10 to 15 feet bgs near the former Bunker C fuel oil AST and west of the collection wells. TPHd and TPHo concentrations in groundwater ranged from 52 to 160,000 ug/L and 150 to 950,000 ug/L, respectively; the highest concentrations were detected at depths of 10 to 18 feet bgs in the central portion of the Site and to the west of the collection wells.

The Data Gap Investigation Report concluded that the GWETS system likely increases the rate of NAPL discharge to the Sacramento River because it increases the hydraulic gradient through the source area and likely results in increased NAPL migration to the retaining wall. The report also concluded that the current GWETS cannot collect NAPL being transported to the retaining wall. The report recommended proceeding with a feasibility study to develop potential remedial alternatives for managing or treating NAPL in soil and groundwater at the Site and dissolved phase migration to the Sacramento River. The report acknowledged that additional data collection may be needed to support evaluation of remedial alternatives and design of the selected remedy.

22. CH2M Hill conducted additional investigations at the Site in 2012 and 2013, to collect data to refine the groundwater model and establish baseline hydraulic conditions for installation of a barrier wall (the primary NAPL remedy under consideration at that time). Nine borings were drilled to the alluvium/bedrock interface and an additional three borings were extended into bedrock to depths up to 72 feet bgs. Nine locations were completed as piezometers. NAPL samples collected from two borings showed similar characteristics to NAPL observed on the western side of the retaining wall, within the interceptor trench, and in the grout tubes on the eastern side of the retaining wall. CH2M Hill interpreted that this confirmed a preferential pathway for NAPL migration. This work is documented in CH2M Hill's *Draft UPRR North Dunsmuir Pre-Barrier Wall Investigation* dated March 2013.
23. In April and May 2014, CH2M Hill conducted a test pit investigation within the interceptor trench and along the retaining wall to better understand the configuration of the concrete retaining wall footing and the HDPE liner along the interceptor trench. The investigation collected observational data on water and oil inflow and evaluated sidewall sloughing to aid in remedial design. During the investigation activities, CH2M Hill noted that oil flow with groundwater was substantial.

24. In March 2016, CH2M Hill submitted the *Remedy Implementation Work Plan, North Fueling Facility Dunsmuir, California*. UPRR's proposed remedial action objectives (RAOs) were to: (1) prevent or limit, to the extent practicable, NAPL discharge to the Sacramento River; and (2) integrate the remedy within the Site infrastructure constraints. The work plan proposed to improve oil recovery using an in-ground OWS with approximate dimensions of 20-feet long by 4-feet wide with large openings in the direction of groundwater flow to allow NAPL enter the separator for recovery. The proposed positioning of the OWS (between existing collector wells CW5 and CW6) was based on CH2M Hill's interpreted preferential flow path for NAPL migration.
25. The second GWETS operated from 1993 until December 2016 when the system was shut down because of a mechanical failure and electrical issues.
26. In a 4 May 2017 letter, Staff requested: a GWETS status report; re-evaluation of the RAOs; a detailed remedial alternatives evaluation; and a CSM summary that addresses NAPL migration, dissolved phase hydrocarbons, and other pollutants of concern to the Sacramento River. The letter also requested that UPRR perform weekly visual inspections of the sidewalk seepage area and the Sacramento River for evidence of NAPL. The letter requested submittal of a GWETS status report by 19 May 2017 and submittal of RAOs, the CSM summary, and remedial alternatives evaluation by 23 June 2017.
27. On 31 May 2017, CH2M Hill submitted the *UPRR North Dunsmuir Groundwater Extraction and Treatment System Status Update*. CH2M Hill stated that the GWETS is ineffective at economically removing NAPL and preventing NAPL from migrating to the Sacramento River. Between 2006 and 2016, the GWETS treated 139 million gallons of water, and removed 26 gallons of NAPL and 1,540 pounds of TPH, at a cost of \$1.3 million. In a 14 July 2017 letter, Staff concurred with the findings and requested that UPRR proceed with preparing the updated CSM and Feasibility Study to address NAPL migration, dissolved phase petroleum hydrocarbons in groundwater, and the potential need to address metals. The CSM and Feasibility Study were to be submitted by 1 September 2017.
28. On 25 September 2017, CH2M Hill submitted the *Conceptual Model Summary, Union Pacific Railroad Company, North Dunsmuir Rail Yard, Dunsmuir, California* (Conceptual Site Model Summary) which presents the NAPL sources, nature and extent of NAPL and dissolved-phase hydrocarbons, NAPL transport mechanisms, fate and transport of NAPL and dissolved phase hydrocarbons, and estimates of mass flux to the Sacramento River.
29. On 28 September 2017, Staff conducted a site inspection. Field observations included: NAPL sheen on the water surface in collection wells CW1, CW3, CW5, CW6, CW7, CW8, CW16, and CW18; an area of NAPL on the sidewalk below collection well CW6; several areas of sheen on the sidewalk adjacent to the river; evidence of overfilling of

the 250-gallon oil collection tank near collection well CW1; and disrepair of the GWETS and monitoring well network.

30. In a 11 December 2017 letter, Staff requested two separate feasibility studies, one for NAPL and one for dissolved phase contaminants. The letter requested preparation of a NAPL Feasibility Study to identify remedial options for NAPL in the northern and central portions of the Site and that the RAOs should address how to prevent NAPL from discharging to the Sacramento River. The letter recommended speciation of the NAPL to determine its toxicity and to identify suitable methods for its removal, degradation and/or immobilization. The letter indicated that the NAPL Feasibility Study should be accompanied by a sampling plan to allow quantification of the NAPL flux at the retaining wall. Staff stated that the mass flux presented in the Conceptual Site Model Summary likely significantly underestimated the amount of NAPL reaching the river. The letter requested submittal of the NAPL Feasibility Study by 1 March 2018.

The 11 December 2017 letter also requested submittal of a Dissolved Phase Feasibility Study by 1 February 2019. The submittal date for the feasibility study was delayed to allow UPRR time to collect current groundwater quality data and evaluate the extent and orientation of the dissolved plume(s). The letter indicated that the Dissolved Phase Feasibility Study should be accompanied by a sampling and analysis plan describing the proposed cleanup goals, analyses, field methods and procedures, and evaluation of the condition of the existing monitoring network.

31. In a 15 January 2018 letter, CH2M Hill indicated that, as an interim measure, UPRR intended to proceed with the in-ground OWS as a pilot test (proposed in the March 2016 Remedy Implementation Work Plan) to determine its viability as a final NAPL remedy. The letter indicated that the NAPL OWS pilot test would occur in the fall of 2018 and that the evaluation would be concluded by the second quarter of 2019. In a 24 January 2018 telephone meeting, Staff expressed reservations about proceeding with the pilot study prior to submittal of the NAPL Feasibility Study; Staff indicated that past in-ground efforts to collect the NAPL had proved ineffective and that the in-ground OWS approach would likely fail. Staff expressed concerns about the limited size of the proposed OWS given that NAPL is observed throughout the collection trench and not solely in the area of CH2M Hill's estimated preferential NAPL migration pathway.
32. In a 30 July 2018 letter, Staff responded to UPRR's request to extend the NAPL Feasibility Study deadline to 30 September 2018. This was UPRR's third request to delay submittal of a remedial alternatives evaluation. The letter noted that monthly inspection reports prepared by UPRR's consultant (Jacobs, formerly CH2M Hill) indicated that since shut down of the GWETS in December 2016, the discharge area to the sidewalk, and likely the river, was expanding. Staff stated that although the GWETS was unsuccessful at collecting NAPL, it may have controlled the NAPL distribution and the volume of NAPL discharging to the river. Staff granted the extension request provided that UPRR re-commenced GWETS operation by 6 August 2018, and continued its operation until such time as the NAPL Feasibility Study is submitted and a

suitable remedy is selected and implemented. To-date, UPRR has not resumed GWETS operations or submitted the final NAPL Feasibility Study. Staff received a draft NAPL Feasibility Study on 19 October 2018.

33. As directed by Staff, since May 2017, UPRR's consultant (CH2M Hill, now Jacobs) has performed monthly NAPL inspections of the seep area, sidewalk, and collection wells. These inspections have shown an increasing area of oil seepage on the sidewalk.
34. As directed by Staff, in October 2017, UPRR's consultant initiated monthly river stage and groundwater elevation measurements and quarterly groundwater sampling. The monitoring objective is to evaluate static (non-pumping) conditions and collect data to support evaluation of potential remedies to address NAPL and dissolved phase impacts at the Site.
35. Based on observations during the monthly NAPL inspections (see Finding 33), in September 2018, Jacobs inspected the 33 grout tubes along the sidewalk for the presence of NAPL. Attempts to remove NAPL from the grout tubes using multiple techniques removed approximately one gallon of NAPL. Jacobs repeated the NAPL removal efforts in October 2018, removing approximately eight gallons of NAPL.
36. In response to a citizen complaint, on 19 September 2018 and 24 September 2018, the California Department of Fish and Wildlife (DFW), Office of Spill Prevention and Response (OSPR) staff conducted site inspections. OSPR observed oil seepage on the sidewalk and within the Sacramento River adjacent to the Site. On 18 October 2018, OSPR staff returned to the Site and observed Jacobs performing grout tube and walkway cleanup activities. OSPR staff noted oil oozing through the concrete wall after the cleanup activities.
37. Known sources of fuel oil (NAPL) include the former Bunker C fuel oil and diesel fuel ASTs located in the northern portion of the Site, along associated fuel distribution pipelines, and near the GWETS effluent infiltration system and former surge pond in the southern portion of the Site. Other NAPL sources may be present at the Site, such as near other former fuel tanks for which the locations are not documented, and in areas where maintenance and repair activities were conducted.
38. Site investigations conducted to-date have not fully identified the lateral and vertical extent of NAPL. In the upper groundwater zone, NAPL generally occurs between the railroad tracks to the west and eastward to the Sacramento River, and between the area north of the former ASTs and the City of Dunsmuir building to the south. The presence of NAPL in fractured bedrock has not been investigated.
39. Dissolved TPH plumes are also present at the Site. The nature and extent of these dissolved plumes has not been fully defined.

Legal Authority

40. This Order is issued pursuant to Porter-Cologne Water Quality Control Act (Porter-Cologne Act), Water Code section 13000 et seq.
41. Subdivision (a) of Water Code section 13304 provides in pertinent part as follows:

[A] person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall ... clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts.

Persons subject to a Cleanup and Abatement Order (CAO) under Water Code section 13304 are referred to as “responsible parties.”

42. Under the Porter-Cologne Act, “waste” is broadly defined as including “sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.” (Wat. Code, § 13050, subd. (d).)
43. The Porter-Cologne Act defines “pollution” as “an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either: “The waters for beneficial uses,” or “Facilities which serve these beneficial uses.” (Wat. Code, § 13050, subd. (f)(1).)
44. Under the Porter-Cologne Act, a “nuisance” is defined as anything that: “(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property”; “(2) Affects ... an entire community or neighborhood, or any considerable number of persons...”; and “(3) Occurs during, or as a result of, the treatment or disposal of wastes.” (Wat. Code, § 13050, subd. (m).)
45. The *Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin*, May 2018 (*Basin Plan*) designates beneficial uses of the waters of the State of California, establishes water quality objectives (WQOs) to protect these uses, and establishes implementation policies to implement WQOs.
46. Per the *Basin Plan*, designated beneficial uses for the upper Sacramento River are irrigation, stock watering, water contact recreation, canoeing and rafting, and non-

contact water recreation, cold fresh water habitat, cold water spawning, and wildlife habitat.

47. Per the *Basin Plan*, designated beneficial uses of underlying groundwater, as stated in the *Basin Plan*, are municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).
48. The *Basin Plan* contains a narrative WQO for chemical constituents which requires, in part, that groundwater not contain chemical constituents in concentrations that adversely affect any beneficial use. For MUN-designated groundwater, the *Basin Plan* incorporates by reference drinking water maximum contaminant levels (MCLs) promulgated in Chapter 15 of California Code of Regulations, title 22 (Title 22).
49. The *Basin Plan* also establishes narrative WQOs for tastes and odors and toxicity. The taste and odor WQO requires, in part, that groundwater not contain taste or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes and odors to municipal and domestic water supplies. The toxicity WQO requires, in part, that groundwater and surface water be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s).
50. Section 3.1.10 of the *Basin Plan* provides that surface water “shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.”
51. This Order implements State Water Resources Control Board (State Water Board) Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*), which is included as Appendix 9 to the Central Valley Water Board’s *Basin Plan*. Essential elements of Resolution No. 92-49 are as follows:
 - a. *Cleanup Levels*—Responsible Parties are required to clean up wastes in a manner that promotes attainment of either background water quality, or the best water quality that is reasonable, if background levels of water quality cannot be restored. In accordance with the State Water Board’s *Statement of Policy with Respect to Maintaining High Quality Waters in California*, Resolution No. 68-16 (*Antidegradation Policy*), such alternative cleanup levels shall: (i) be consistent with the maximum benefit to the people of the State of California; (ii) not unreasonably affect beneficial uses of water (present and anticipated); and (iii) not result in water quality less than as prescribed in the *Basin Plan* (e.g., WQO for oils, greases and waxes) and other applicable plans and policies.

- b. *Submission of Work Plans and Reports*—To the extent practical, the Central Valley Water Board will require and review for adequacy written work plans for each element and phase, and written reports describing the results of each phase of the investigation and cleanup.
 - c. *Concurrence with Remedial Proposals*—The Central Valley Water Board will concur with investigative and cleanup proposals with a substantial likelihood of achieving compliance with applicable Remedial Action Objectives (RAOs) in a reasonable timeframe.
52. Waste constituents associated with releases at the Site threaten to impart objectionable tastes and odors to groundwater and surface water, and threaten to produce detrimental physiological responses in humans if contaminated groundwater or surface water is used for municipal or domestic purposes, or if ecological receptors contact contaminated surface water or NAPL. Therefore, the waste constituents released at the Site threaten to adversely affect the designated beneficial uses, thereby causing or threatening to cause a condition of “pollution” or “nuisance,” as defined in Water Code section 13050.
 53. Based on **Findings 1-39** and **52**, the Responsible Party is subject to this Order because they have caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged to waters of the State and has caused, or has threatened to cause, a condition of pollution or nuisance. Therefore, the Central Valley Water Board is authorized to order the Responsible Party to clean up and abate the effects of the waste pursuant to Water Code section 13304.
 54. Pursuant to Water Code section 13304, the Central Valley Water Board is entitled to, and may seek reimbursement for, all reasonable costs it actually incurs investigating and abating the effects of the unauthorized discharges of waste and to oversee/supervise the cleanup of such waste, or other remedial action, required by this Order.
 55. This Order is also issued pursuant to Water Code section 13267, subdivision (b)(1), which provides in pertinent part as follows:

[The] regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region ... shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring the person to provide the reports.

56. This Order is accompanied by the separately-issued Monitoring and Reporting Program R5-2019-0713 (MRP), which is included as **Attachment C** and incorporated herein. Any revisions to the operative MRP shall be controlling over the provisions attached hereto.
57. The various monitoring and reporting activities required under this Order, as well as those under the operative MRP, are necessary for ensuring compliance with this Order consistent with State Water Board Resolution No. 92-49.
58. On 31 January 2019, the Responsible Party submitted a Draft Monitoring Plan for monitoring and reporting activities required under the Draft MRP dated 22 March 2019.
59. On 5 April 2019, Staff responded that “[t]he Draft Monitoring Plan largely meets the requirements of the [Draft MRP dated 22 March 2019]” The Staff letter went on to state as follows:

Please note that the Draft MRP requires more frequent monitoring and site inspections than are outlined in the Draft Monitoring Plan. The Draft MRP requires a minimum of twice weekly site inspections for the presence of oil, oil sheen, or other signs of contaminant discharge in or near the Sacramento River, monthly inspection of the grout tubes, and monthly monitoring well field testing (gauging, non-aqueous phase liquid (NAPL) inspection, field parameters). The Draft Monitoring Plan only outlines monthly inspections for the presence of oil at the Sacramento river, quarterly grout inspections, and quarterly field testing of all onsite monitoring wells.

Staff recommends that UPRR increase the frequency of the above-mentioned activities to reflect the anticipated requirements of the final MRP. Please note that a final monitoring plan incorporating the ordered monitoring requirements will be required after the CAO is adopted.

60. The Responsible Party’s 31 January 2019 Draft Monitoring Plan is **provisionally approved in part**, subject to the revisions specified in Staff’s letter dated 5 April 2019, and any changes in the Final MRP (e.g., PQLs for VOCs and PAHs). This Order requires the Responsible Party to immediately begin implementing its approved Monitoring Plan; and to submit a revised version reflecting such changes.
61. This Order is issued by the Executive Officer under authority delegated pursuant to Water Code section 13223, and Central Valley Water Board Resolution R5-2018-0057.

Approach to Remediation

62. This Order embraces a comprehensive, multi-phased approach to remedy development and implementation to cleanup and abate waste that has been discharged, and continues to be discharged from the Site to underlying groundwater; and through underlying groundwater to the adjacent Sacramento River.

63. The Responsible Party will be permitted to attempt cleanup and abatement through a single phase of one or more remedies (Preliminary Phase). However, if Preliminary Phase remedies prove unsuccessful, the Responsible Party will then be required to proceed to subsequent phases.
64. Instead of separate Feasibility Studies and Remedial Action Plans for each remedial phase, this Order requires the preparation of a single Feasibility Study and Remedial Action Plan governing not only the Preliminary Phase, but also subsequent remedial phases (contingent on the outcome of already-implemented remedies).
65. In the Feasibility Study, the Responsible Party will be required to analyze an array of remedies for a variety of potential conditions in reference to an updated Conceptual Site Model; group potential remedies into proposed phases; and establish an overall process for remedy phasing and evaluation. In all respects, the Feasibility Study will be sufficiently comprehensive so as to facilitate the development of a Remedial Action Plan that will account for the need for several potential remedial activities without the need for Remedial Action Plan revision.
66. In the Responsible Parties' draft Remedial Action Plan, the Responsible Party will be required select one or more remedies to be implemented as part of the Preliminary Phase. These remedies will specifically target NAPL constituent migration to the Sacramento River, which is of paramount concern. Other water quality issues (e.g., dissolved-phase constituent migration) may be included in the Preliminary Phase or left for subsequent phases, if the Responsible Party so chooses. The Remedial Action Plan will also establish the criteria by which the efficacy of implemented remedies will be judged, and subsequent remedial phases will be initiated.
67. In any event, this Order requires the expeditious cleanup and abatement of waste in accordance with cleanup levels consistent with State Water Board Resolution No. 92-49 (*inter alia*), and not merely the Responsible Party's performance of certain tasks.

Compliance with CEQA

68. This Order will require the Responsible Party to continue investigation efforts, perform regular monitoring, and develop and implement a remedial action plan. While the Central Valley Water Board may need to evaluate potentially significant environmental impacts associated with implementing the work plan prior to approving the work plan pursuant to the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., the Central Valley Water Board is not required to engage in speculation about what those impacts would be before the investigation is conducted and before a remedial action plan is submitted.
69. As for the remaining requirements imposed by this Order (the ongoing investigation, the regular monitoring, and the development of any required remedial action plan), the Central Valley Water Board finds that it can be seen with certainty that undertaking

these actions will not have a significant effect on the environment. (Cal. Code Regs., tit. 14, § 15061, subd. (b)(3).)

70. Under this Order, the Responsible Party will be required to submit a Draft Remedial Action Plan (Draft RAP) to the Executive Officer for approval. The Executive Officer's discretionary approval of the Draft RAP will constitute a formal revision of this Order, requiring separate compliance with CEQA (as the circumstances may require). Accordingly, this Order requires the Responsible Party to submit appropriate CEQA documents with its Draft RAP.
71. Additionally, before approving the Draft RAP, the Central Valley Water Board will comply with the notice and public comment requirements of Water Code section 13307.5, subdivision (a).
72. Should additional environmental review be required in connection with future discretionary regulatory actions at the Site, the Central Valley Water Board may recover the costs associated with preparing and processing environmental documents from the Responsible Party. (Pub. Resources Code, § 21089.)

(required actions begin on next page)

REQUIRED ACTIONS

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13267 and 13304, the Responsible Party shall conduct necessary investigation and characterization of the waste, clean up and abate the effects of the waste, and monitor the Site to document clean up progress. Compliance with this requirement shall include, but not be limited to, the following.

Table 1—Summary of Required Tasks

<u>REQUIRED TASK</u>	<u>COMPLIANCE DATE</u>
1. Monitoring and Reporting	
a. Begin Implementing Provisionally-Approved <i>Monitoring Plan</i> (§ A.1.a)	Immediately
b. Submit Revised <i>Monitoring Plan</i> (§ A.1.b)	<+7 days>
c. Begin Submitting <i>Monthly Reports</i> per MRP	10 July 2019 (Report for June 2019)
d. Begin Submitting <i>Quarterly Monitoring Reports</i> per MRP	1 August 2019 (Report for 2nd Qtr. 2019)
e. Begin Submitting <i>Annual Monitoring Reports</i> per MRP	1 February 2020 (Report for 2019)
f. Begin Submitting <i>Annual Remedial Status Reports</i> (§ A.3)	1 February 2020 (Report for 2019)
2. Interim NAPL Discharge Control	
a. Submit <i>Interim NAPL Discharge Control Plan</i> (§ B.1)	<+30 days>
b. Begin <i>Implementing Interim NAPL Discharge Control Plan</i> (§ B.1)	Immediately upon Submission
c. Submit <i>Updated Interim NAPL Discharge Control Plan</i> (§ B.2)	2 September 2019
d. Begin Implementing <i>Updated Interim NAPL Discharge Control Plan</i> (§ B.3)	Within 30 Days of Submission

REQUIRED TASK

COMPLIANCE DATE

3. Comprehensive Site Investigation

- | | | |
|----|---|--|
| a. | Submit <i>Comprehensive Site Investigation Work Plan</i> (§ C.1) | 15 October 2019 |
| b. | Submit <i>Comprehensive Site Investigation Summary Report</i> (§ C.2) | Within 6 Months of Concurrence in <i>Work Plan</i> |

4. Feasibility Study and Remedial Action Plan

- | | | |
|----|---|--|
| a. | Submit <i>Feasibility Study</i> (§ D.1) | Within 3 Months of Concurrence in <i>Summary Report</i> |
| b. | Submit <i>Draft Remedial Action Plan</i> for Executive Officer Approval (§ D.2) | Within 9 Months of Concurrence in <i>Feasibility Study</i> |
| c. | Submit <i>CEQA Documentation</i> for Approval of Draft Remedial Action Plan (§ D.3) | (same as above) |

5. Preliminary Remedial Phase

- | | | |
|----|---|--|
| a. | Submit <i>Remedial Design Implementation Plan</i> for Preliminary Remedial Phase Remedies (§ E.1) | Within 9 Months of <i>Remedial Action Plan</i> Approval |
| b. | Begin Implementation of Preliminary-Phase Remedies (§ E.1.b) | Within 3 Months of Concurrence in <i>Implementation Plan</i> |
| c. | Submit Preliminary-Phase <i>Remedy Implementation Completion Report</i> (§ E.1.c) | Within 12 Months of Initial Implementation |

REQUIRED TASK

COMPLIANCE DATE

6. Subsequent Remedial Phases

- | | | |
|----|--|--|
| a. | Submit <i>Subsequent Phase Time Schedule</i> for Subsequent Remedial Phases | As Directed by Assistant Executive Officer |
| b. | For Each Subsequent-Phase Remedy, Submit <i>Remedial Design Implementation Plan</i> | Per Approved <i>Subsequent Phase Time Schedule</i> |
| c. | For Each Subsequent-Phase Remedy, Commence Implementation | (same as above) |
| d. | For Each Subsequent-Phase Remedy, Submit <i>Remedy Implementation Completion Reports</i> | Within 12 Months of Initial Implementation |

(required actions continue on next page)

A. Monitoring and Reporting

1. Monitoring Plan Implementation
 - a. Immediately upon the issuance of this Order, the Responsible Party shall begin implementing the *provisionally-approved* Draft Monitoring Plan, subject the changes identified in Staff in the letter dated 5 April 2019.
 - b. Within 7 days of the effective date of this Order,¹ the Responsible Party shall submit, for Staff review, a revised Monitoring Plan reflecting changes identified in the Staff letter dated 5 April 2019. Upon submittal, version shall become the operative Monitoring Plan for implementation.
 - c. Within 30 days of any subsequent revisions to the operative MRP, the Responsible Party shall submit a Revised Monitoring Plan that addresses any substantive changes in the MRP.²
 - d. The Responsible Party shall submit revised Monitoring Plans as directed by the Assistant Executive Officer in writing.
 - e. Subsequently-submitted Monitoring Plans shall contain all required elements listed in Section 7 of Attachment B.
2. The Responsible Party shall submit **Monitoring Reports** in accordance with the operative MRP, beginning with the following:

<u>First Monitoring Report</u>	<u>Due Date</u>
Monthly Report for June 2019	10 July 2019
Quarterly Report for 2nd Quarter 2019	1 August 2019
Annual Report for 2019	1 February 2020

Each monitoring report shall include an update on any Interim NAPL Discharge Control activities, investigation activities, and remedial activities undertaken pursuant to this Order.

¹ Unless otherwise specified, all deadlines shall be calculated in reference to the effective date of this Order.

² If there are no substantive changes in the new MRP, a *Revised Monitoring Plan* will not be required.

3. The Responsible Party shall submit **Annual Remedial Status Reports** on 1 February of each year, beginning with the Status Report for 2019 (due 1 February 2020).³ In addition to the required elements listed in Section 8 of Attachment B, each Annual Remedial Status Report shall include the following:
 - a. An evaluation of whether the operative Remedial Action Objectives (RAOs) are either currently being met, or on-track to being met;
 - b. A description of the remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, updated mass-in-place estimate, and plans to improve effectiveness of any ongoing remedy;
 - c. An identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program;
 - d. Any recommended corrective actions; and
 - e. An updated Conceptual Site Model (CSM).

B. Interim NAPL Discharge Control

1. Within 30 days, the Responsible Party shall submit for Staff written concurrence, and immediately begin implementing, an **Interim NAPL Discharge Control Plan** that provides for the following:
 - a. Routine Site inspections for NAPL discharge to the sidewalk and Sacramento River, as described in the MRP;
 - b. Routine sidewalk cleaning;
 - c. Place and maintain absorbent materials on/adjacent to the wall as conditions permit; and
 - d. Other appropriate control measures under the circumstances.
2. No later than 2 September 2019, the Responsible Party shall submit, for Staff concurrence, an **Updated Interim NAPL Discharge Control Plan** that includes additional control measures appropriate to mitigate NAPL seepage migration in a timely manner until the final remedy deployment (e.g., GWETS operation for hydraulic NAPL containment). The updated plan shall begin to be implemented within 30 days of submission.

³ The Annual Remedial Status Report and Annual Monitoring Report may be combined into a single Annual Report.

3. The Responsible Party shall submit and/or implement revised Interim NAPL Discharge Control Plans as directed by the Assistant Executive Officer in writing.

C. Comprehensive Site Investigation

1. No later than 15 October 2019, the Responsible Party shall submit for Staff concurrence a **Comprehensive Site Investigation Work Plan**.
 - a. In addition to the required elements listed in Section 5 of Attachment B, the Work Plan shall generally provide for:
 - i. Collecting sufficient data to facilitate the remedy selection process for both NAPL and non-NAPL contaminants, and, to the extent possible, the remedial design process; and
 - ii. Developing a design stage Conceptual Site Model (CSM) necessary to support development of the FS and RAP, as well as any relevant Staff input on the subject.
 - b. Unless demonstrated to be unnecessary (and supported with data)⁴ the Work Plan shall specifically provide for the following activities⁵ to be conducted in initial or subsequent investigations:
 - i. Benthic/macroinvertebrate survey of the Sacramento River adjacent to the Site;
 - ii. Survey of the Sacramento River during high and low water conditions for NAPL seepage and NAPL pools (when conditions allow safe access);
 - iii. Sediment and pore water sampling within the Sacramento River;
 - iv. Confirmation of geophysical survey results of NAPL distribution;
 - v. Speciation, toxicity, and mobility assessment of the multiple NAPL sources at the Site (e.g., Bunker C fuel oil sources, diesel fuel sources, mixed fuel oil sources);
 - vi. Delineation of the northern, southern and western extent of NAPL;
 - vii. Assessment of the presence of NAPL in bedrock units;

⁴ The Responsible Party may propose alternative activities capable of addressing the same issue, provided that any such proposals must be supported by data and other relevant evidence.

⁵ The activities listed in this section represent those that must be included as part of the Site Investigation Work Plan. Additional activities should be proposed as appropriate.

- viii. Further assessment of the former surge pond area;
 - ix. Completion of a Human and Ecological Risk Assessment; and
 - x. Expanded groundwater monitoring network and replacement of monitoring wells removed in the course of implementing the operative Interim NAPL Discharge Control Plan per Section B of this Order or the remedial action plan.
- c. Responsible Party shall include as an appendix copies of all available maps and diagrams depicting operational configurations and infrastructure at the Railyard (from the start of operations to present day).
2. Within 6 months of Staff concurrence in the Comprehensive Site Investigation Work Plan, the Responsible Party shall submit, for Staff concurrence, a **Comprehensive Site Investigation Summary Report**. In addition to each of the mandatory elements listed in Section 6 of Attachment B, the Summary Report shall include:
- a. A detailed discussion of Site investigation methods and results;
 - b. An updated Site Conceptual Model (CSM) sufficiently comprehensive and detailed as to facilitate the subsequent preparation of a Feasibility Study and Remedial Action Plan in accordance with this Order;
 - c. A complete Human Health and Ecological Risk Assessment;
 - d. Proposed initial Remedial Action Objectives (RAOs) to be considered in the subsequent Feasibility Study⁶; and
 - e. Any other relevant recommendations appropriate under the circumstances.

D. Remedial Analysis and Planning

1. Within 3 months of Staff concurrence with the Comprehensive Site Investigation Summary Report, the Responsible Party shall submit, for Staff concurrence, a **Feasibility Study** with the required elements listed in Section 1 of Attachment B. Additionally, the Feasibility Study shall:
- a. Establish the overall process by which remedies will be initially phased and then subsequently evaluated once implemented;

⁶ Preliminary RAOs identified in the Summary Report must be specific enough to facilitate meaningful analyses in the subsequent *Feasibility Study*. Throughout the investigation and remediation process, RAOs must be consistent with Water Quality Objectives (WQOs) under the Basin Plan. (See Findings 46-50.)

- b. Provide an in-depth analysis of remedies to be executed in at least two sequential or partially-overlapping phases;
 - c. Be comprehensive in scope so as to facilitate the development of a Remedial Action Plan that will not need to be revised based on the outcome of an initial remedial phase; and
 - d. Address all RAOs identified in the Comprehensive Site Investigation Summary Report.
2. Within 9 months of Staff concurrence in the Feasibility Study, the Responsible Party shall submit, for Executive Officer approval, a **Draft Remedial Action Plan** with all of the required elements listed in Section 2 of Attachment B. Additionally, the Draft Remedial Action Plan shall include:
 - a. A Preliminary Phase and time schedule for remedies specifically targeting NAPL migration to the Sacramento River (remedies for other constituents may be proposed for the first phase as well);
 - b. A phasing process and decision points for subsequent contingent remedies (i.e., which alternatives could be implemented and what additional data would need to be obtained);
 - c. Proposed final RAOs;
 - d. For each proposed phase, specific criteria for evaluating the efficacy and outcome of each remedy, and conditions for advancing to the next phase; and
 - e. Include the processes described below in Section E for implementation of the various phases of the remedial action.
3. Concurrent with its submittal of the Draft Remedial Action Plan, the Responsible Party shall submit all required **CEQA Documents** (e.g., Initial Study and Draft Mitigated Negative Declaration/Draft Environmental Impact Report).
4. In approving the Remedial Action Plan, the Executive Officer may make any revisions deemed appropriate under the circumstances, and in response to comments received from the public and other regulatory agencies. (See Wat. Code, § 13307.5, subd. (a).)

5. Prior to approving the Remedial Action Plan, the Executive Officer⁷ may direct the submission of either:
 - a. Finalized versions of the Draft Remedial Action Plan and necessary CEQA Documents (reflecting certain itemized changes to the documents as originally submitted); or
 - b. Editable versions of the Draft Remedial Action Plan and necessary CEQA Documents (i.e., as Microsoft Word files) for necessary revisions by Staff at the Executive Officer's direction.
6. Once approved, the Remedial Action Plan shall be incorporated herein.

E. Remedial Action

1. Preliminary Phase

- a. Within 9 months of Remedial Action Plan approval, the Responsible Party shall submit, for Staff concurrence, a **Remedial Design Implementation Plan** for the remedies to be implemented as part of the Preliminary Phase. The plan shall include each of the required elements listed in Section 3 of Attachment B.
- b. Within 3 months of Staff concurrence in the Remedial Design Implementation Plan, the Responsible Party shall **commence implementation** of Preliminary Phase remedies, and complete implementation within 12 months thereafter.
- c. Within 12 months of initiating implementation, the Responsible Party shall submit, for Staff concurrence, a **Remedy Implementation Completion Report** for all Preliminary Phase remedies. The report shall include all required elements listed in Section 4 of Attachment B.

2. Subsequent Phases

- a. Once all remedies have been fully implemented for the current phase, the Assistant Executive Officer may, after determining that sufficient data has been collected to evaluate the efficacies and outcomes of implemented remedies (i.e., according to criteria provided in the approved Remedial Action Plan), direct the submission of a **Subsequent Phase Time Schedule** within 14 days.

⁷ This written request may be made by the Assistant Executive Officer on behalf of the Executive Officer.

- b. In addition to the contents specified by the Assistant Executive Officer, the Subsequent Phase Time Schedule shall include proposed dates⁸ for:
 - i. For each subsequent phase remedy, submission of a **Remedial Design Implementation Plan** for Staff concurrence;
 - ii. **Initial implementation** and **complete implementation** of each subsequent phase remedy; and
 - iii. For each subsequent phase remedy, submission of a **Remedy Implementation Completion Report** for Staff concurrence.
- c. Proposed dates in the Subsequent Phase Time Schedule shall be supported by technical justification. Additional information may be requested by the Assistant Executive Officer.
- d. The Assistant Executive Officer shall approve Subsequent Phase Time Schedules, together with any modifications deemed appropriate under the circumstances. (See, e.g., § F.2.a.)
- e. Upon approval, activities and dates in each Time Schedule shall be incorporated and made enforceable as part of this Order.
- f. Unless otherwise specified by the Assistant Executive Officer in writing, all subsequently-submitted reports and work plans shall contain the required elements listed in Attachment B.

F. Other Provisions

1. Site Access

The Responsible Party shall provide Staff and representatives with reasonable Site access for conducting inspections and verifying compliance with this and other orders of the Central Valley Water Board, and take other actions as necessary to implement Division 7 of the Water Code.

2. General Requirements for Remedial Activity

- a. In all respects, the Responsible Party shall proceed with cleanup and abatement of waste as expeditiously as reasonably possible, and without risk to human health and safety. Whenever a time schedule (or similar submittal) requires approval under this Order, proposed dates may be

⁸ In lieu of fixed dates (e.g., "3 December 2013"), dates in a time schedule shall be expressed in relative terms (e.g., "3rd Phase Remedial Design Implementation Plan to be submitted within 2 months of 3rd Phase Time Schedule approval").

revised where it appears that actions could be taken in a shorter time span.

- b. The Responsible Party shall continue any remediation or monitoring activities until the Assistant Executive Officer determines that sufficient cleanup has been accomplished to fully comply with this Order and this Order has been either amended or rescinded in writing.
- c. The Responsible Party shall obtain all local and state permits and access agreements necessary to fulfill the requirements of this Order prior to beginning work.
- d. The Responsible Party shall notify Central Valley Water Board staff at least three working days prior to any onsite work, testing, or sampling that pertains to environmental remediation and investigation and is not routine maintenance or inspection.

3. Reporting Provisions

- a. All reports and laboratory data shall be uploaded to State Water Board's **GeoTracker Database** (<http://geotracker.swrcb.ca.gov>). (See Cal. Code Regs., tit. 23, § 3890 et seq.)
 - i. Analytical laboratory data for soil, vapor, and water samples shall be saved/submitted as **Electronic Deliverable Format (EDF)**.
 - ii. Site Maps (i.e., GEO_MAP), boring/well survey information, depth to groundwater, boring logs and well screen intervals, location data (i.e., GEO_XY file), elevation data (i.e., GEO_Z file), and technical reports (e.g. work plans, assessment, and monitoring reports) shall be saved/submitted in searchable **Portable Data Format (PDF)**.
- b. After each upload to GeoTracker, notify Central Valley Water Board staff via email (centralvalleyredding@waterboards.ca.gov), including the following information in the email body:

Attention:	Groundwater Unit
Report Title:	--
GeoTracker Upload ID:	--
Discharger Name:	Union Pacific Railroad Co.
Facility Name:	Dunsmuir Railyard, North Fueling Facility
County:	Siskiyou
CIWQS place ID:	220849

- c. All submittals shall be accompanied by a transmittal letter with the following certification from an authorized representative:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted, to the best of my knowledge and belief, is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

- d. Reported data shall be arranged in tabular form so as to render readily discernable all dates, sample types (e.g., run-on, outflow) and reported analytical results for each sample; and summarized in such a manner to clearly illustrate compliance with this Order.
- e. In accordance with Business and Professions Code sections 6735, 6835 and 7835.1, work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional. Please ensure that all documents that contain site specific data, data interpretations, or recommendations comply with this requirement and that they include the professional license stamp, signature and statement of professional certification (i.e., California Professional Geologist or California Professional Engineer).
- f. All technical reports submitted by the Responsible Party shall include a cover letter signed by the Responsible Party, or authorized representatives, certifying under penalty of perjury under the laws of the State of California that the signatory has examined and is familiar with the report and that the report is true, complete, and accurate. The Responsible Party shall also state if they agree with any recommendations or proposals and whether they approved implementation of said proposals.
- g. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the

signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

- h. Laboratories analyzing monitoring samples shall be California-certified laboratories (see Wat. Code, § 13176), and include quality assurance/quality control data with their reports.

4. **Requests for Extension**

- a. Except as provided below, the deadlines specified in this Order (and subsequently-incorporated materials), shall not be extended for any reason.
- b. All requests for extensions under this Order shall be submitted in writing to the Assistant Executive Officer, and contain the following information:
 - i. A substantive explanation regarding the need for the extension (e.g., unexpected delays in implementation, obtaining local permits, etc.);
 - ii. Actions taken to prevent similar delays in the future (not required for emergency extensions);
 - iii. The earliest possible date that the Responsible Party will be able to comply with the requirement in question (not required for emergency extensions); and
 - iv. A proposed new deadline and, if later than the earliest possible date of compliance, justification for the later deadline (not required for emergency extensions).
- c. Unless expressly granted by the Assistant Executive Officer in writing (e.g., via email), requests for extension shall be deemed to have been denied.
- d. In reviewing the Responsible Party's request, the Assistant Executive Officer shall consider all relevant circumstances (see, e.g., § 2.a), including:
 - i. Whether the request is timely;
 - ii. The stated justification(s) for an extension;
 - iii. Whether additional data is needed;
 - iv. Whether the same deadline has already been extended;

- v. Whether delays are the result of external factors (e.g., federal, state or local permitting issues); and
 - vi. The length of the requested extension.
- e. Notwithstanding Sections F.4.b–F.4.d, Staff may grant an emergency extension of up to 7 days, provided that:
- i. The need for an extension arises from unforeseen and extraordinary circumstances;
 - ii. The extension is granted in writing (e.g., via email); and
 - iii. The operative deadline has not already been extended on an emergency basis.
- f. All extension requests (including requests on an emergency basis) shall be submitted as soon as the need for an extension arises, and not later than the operative deadline to be extended. An untimely request may be summarily denied or disregarded as untimely.

5. **Technical Concurrences**

- a. The following provisions shall apply whenever a technical work plan or report is to be submitted to Staff for their concurrence.
- b. Unless otherwise specified, Staff shall notify the Responsible Party of concurrence or nonconcurrence in writing (i.e., via email or letter).
- c. If the deadline for performing a given act is to be determined in reference to Staff’s concurrence in a particular submittal, the deadline shall be calculated based on the date indicated on the written notice of concurrence from Staff (i.e., not when the writing is actually received).
- d. In the event that Staff do not concur in the adequacy⁹ or completeness of a submittal (and so indicate in writing), the following will apply.
 - i. Within 30 days of the notice of nonconcurrence, the Responsible Party shall either:

⁹ For the purposes of this section, “adequacy” refers to the competence, capability or likelihood of a proposal meeting specified requirements or investigatory/remedial objectives under this Order, consistent with Water Code section 13360, and State Water Board Resolution No. 92-49.

- (A) Submit a revised or supplemented document addressing each issue identified in the notice of nonconcurrency from Staff¹⁰; *or*
 - (B) Request a final determination from the Executive Officer on the matter of disagreement. The request shall be in writing, and include information justifying a favorable determination.
- ii. Except as otherwise directed in writing by the Executive Officer, upon the submission of a written request for final determination, the Executive Officer shall be deemed to have affirmed Staff's nonconcurrency after 14 days, and the revised/supplemental submittal shall become due within 30 days thereafter.
 - iii. A final determination under this section may be petitioned to the State Water Board in accordance with Water Code section 13320.

If, in the opinion of the Assistant Executive Officer, the Responsible Party fails to comply with the provisions of this Order, the Assistant Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board action may petition the State Water Board for review in accordance with Water Code section 13320, and California Code of Regulations, title 23 (Title 23), section 2050 et seq. The State Water Board must receive the petition by 5:00 p.m. on the 30th day after the date of this Order, except that if the 30th day falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Laws and regulations applicable to filing petitions are available for review on the State Water Board's website (at the address below), and will be provided upon request.

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

¹⁰ When a submittal is to be revised or supplemented, Staff may, at their discretion, extend the time for submission of a revised document as appropriate under the circumstances. Staff otherwise lack authority unilaterally grant extensions under this Order (except as provided in Section F.4.e).

This Order is effective as of the date below.

ORDERED BY:

Original signed by

PATRICK PULUPA, Executive Officer,
Central Valley Water Board

11 June 2019

DATE

Attachments

Attachment A—Site Map

Attachment B—Mandatory Contents for Reports and Work Plans

Attachment C—Monitoring and Reporting Program R5-2019-0713

GLOSSARY

<i>Antidegradation Policy</i>	<i>Statement of Policy with Respect to Maintaining High Quality Waters in California</i> , State Water Board Resolution No. 68-16
AST.....	Aboveground Storage Tank
<i>Basin Plan</i>	Water Quality Control Plan for Sacramento River Basin and San Joaquin River Basin
bgs.....	Below Ground Surface
BOE	California State Board of Equalization
CAO.....	Cleanup and Abatement Order (Wat. Code, § 13304)
CEQA	California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.)
CEQA Guidelines	Guidelines for Implementation of CEQA (Cal. Code Regs., tit. 14, § 15000 et seq.)
CSM.....	Conceptual Site Model
CW	18-36” Collection Well
DFW	California Department of Fish and Wildlife
GAC.....	Granular Activated Carbon
GWETS	Groundwater Extraction and Treatment System
HDPE.....	High-Density Polyethylene
µg/L	Microgram per Liter
mg/Kg.....	Milligram per Kilogram
mg/L.....	Milligram per Liter
MRP.....	Monitoring and Reporting Program
mV	Millivolts
NAPL	Non-Aqueous Phase Liquid

NPDES	National Pollutant Discharge Elimination System under Clean Water Act
NTU	Nephelometric Turbidity Unit
OWS.....	Oil Water Separator
OSPR	DFW Office of Spill Prevention and Response
P-[#].....	Vertical Steel "Grout" Pipes Installed in Concrete-Filled Oil Trap
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
Pollution.....	Alteration of Water Quality by Waste Unreasonably Affecting Beneficial Uses (see Wat. Code, § 13050, subd. (l)(1))
Porter-Cologne Act.....	Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.)
RAO(s).....	Remedial Action Objective(s)
RAP	Remedial Action Plan
RDIP.....	Remedial Design Implementation Plan
Responsible Party	Parties Responsible for Compliance with Order
Resolution 92-49	<i>Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304, State Water Board Resolution No. 92-49</i>
RICR.....	Remedy Implementation Completion Report
Risk Assessment.....	Human and Ecological Risk Assessment
SPTC.....	Southern Pacific Transportation Company
Staff	Central Valley Water Board Staff
SVOC(s)	Semi-Volatile Organic Compounds
Title 22.....	California Code of Regulations, Title 22
Title 23.....	California Code of Regulations, Title 23

TPCA.....	Toxic Pits Cleanup Act
TPH	Total Petroleum Hydrocarbons
TPH[d/o/g]	Total Petroleum Hydrocarbons [as Diesel / Oil / Gasoline]
UPRR	Union Pacific Railroad Company
uS/cm	Micro Siemens per centimeter
VOC(s).....	Volatile Organic Compound(s)
Waste	Defined as including “any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal” (see Wat. Code, § 13050, subd. (d).)
WQOs.....	Water Quality Objectives (see Wat. Code, § 13050, subd. (h))

ATTACHMENT A

SITE MAP

(site map on next page)

ATTACHMENT B

MANDATORY CONTENTS FOR WORK PLANS AND REPORTS

Unless otherwise directed in writing (by the Executive Officer, the Assistant Executive Officer or Staff), the mandatory elements listed in this Attachment are applicable to each of the following submittals:

1. Feasibility Studies
2. Remedial Action Plans (RAPs)
3. Remedial Design Implementation Plans (RDIPs)
4. Remedy Implementation Competition Reports (RICRs)
5. Site Investigation Work Plans (SIWPs),
6. Site Investigation Summary Reports (SISRs)
7. Monitoring Plans
8. Annual Remedial Status Reports (ARSRs)

1. FEASIBILITY STUDIES

A. Introduction

- i. Purpose and overview
- ii. Report organization

B. Background

- i. Site description, history, and characteristics
 - a. Lithology and hydrology
 - b. Detailed summary of Preliminary Investigation results
 - c. Source characterization
 - d. Preferential pathways

- ii. Land use
- iii. Summary of site risks
 - a. Human health
 - b. Ecological
 - c. Water resources
 - d. Contaminants of concern
 - e. Physical and chemical properties, toxicity, speciation, mobility for NAPL and dissolved-phase constituents

C. Remedial Action Objectives (RAOs)

- i. Applicable or relevant and appropriate requirements (ARARs)
- ii. Cleanup goals
- iii. Areas exceeding cleanup goals

D. Identify and Screen Remedial Technologies

E. Development and Description of Alternatives

F. Detailed and Comparative Analysis of Alternatives

G. Recommended Alternative

H. References

I. Appendices

- i. ARARs
- ii. Cost estimate and assumption tables
- iii. Technical and economic feasibility analysis
- iv. Updated Conceptual Site Model (CSM)

2. REMEDIAL ACTION PLANS

A. Introduction

- i. Site description and history
- ii. Site characterization
- iii. Previous removal actions taken
- iv. Site geology, hydrogeology and hydrology
- v. Background concentrations (if applicable)

B. Nature and Extent of Contamination

- i. Conceptual Site Model summary (Updated CSM as Appendix)
- ii. Description of contamination by media

- a. Map(s) of source areas, pathways, NAPL or highest concentrations, isopachs, cross-sections, as necessary
- iii. Discussion of mobile vs immobile NAPL, including criteria for determination

C. Remedial Action Objectives (RAOs)

- i. Summary of risk assessment
- ii. RAOs
- iii. ARARs
- iv. Cleanup goals
 - (1) Estimated mass of removal

ATTACHMENT B—MANDATORY CONTENTS FOR WORK PLANS AND REPORTS

- v. Areas and mass to be addressed by remedy

D. Summary of Feasibility Study

- i. Technology screening
- ii. Identification of alternatives
- iii. Evaluation of alternatives
- iv. Comparative analysis
- v. Description of recommended alternative
- vi. Justification for selected remedy

E. Remedial Design

- i. Permitting
- ii. Utility clearance
- iii. Site preparation
- iv. Remedial activities and methods
- v. Control measures
- vi. Monitoring during remedy implementation
- vii. Field variances
- viii. Confirmation sampling and analysis plan (if applicable)
- ix. Transportation plan
- x. Record keeping

F. Institutional Controls (if applicable)

G. Monitoring and Reporting

H. Implementation Schedule

I. Health and Safety Plan (HASP)

J. CEQA Initial Study (if applicable)

K. Public Participation Plan

L. References

M. Tables

N. Figures

O. Appendices

- i. ARARs
- ii. Statement of Reasons
- iii. Administrative Record List
- iv. CEQA documents
- v. Sampling and Analysis Plan (SAP) / Quality Assurance Project Plan (QAPP)
- vi. Responsiveness Summary
- vii. Updated Conceptual Site Model (CSM)

3. REMEDIAL DESIGN IMPLEMENTATION PLANS

A. Introduction

- i. Overview
- ii. RDIP Purpose and Objectives
- iii. Project Background
- iv. Regulatory Considerations
- v. Site-Wide Contamination and Remediation Activities
- vi. Report Organization

B. Site Description and Background Information

- i. Site description and location
- ii. Site history
- iii. Summary of previous investigations and findings
 - a. Site investigations
 - b. Risk assessment
 - c. Feasibility Study
 - d. RAP

C. Remedial Action Objectives and Cleanup Levels

D. Description of Remedy

E. Design

F. Project Organization

G. Implementation Plan

- i. Pre-construction activities

- ii. Construction management

- iii. Construction testing

- iv. Monitoring plan

- v. Data evaluation and reporting

- vi. Implementation schedule

H. Supporting Plans and Documentation

- i. Community Notification Plan

- ii. Soil Management Plan

- iii. HASP

- iv. Storm Water Pollution Prevention Plan (SWPPP) & Rain Event Action Plan (REAP)

- v. Traffic Plan

- vi. Emergency Response Plan

I. Waste Characterization and Disposal Plan

J. Permitting Requirements

K. Environmental Monitoring and Control Measures During Construction

L. Reporting

M. Post-Construction Activities

ATTACHMENT B—MANDATORY CONTENTS FOR WORK PLANS AND REPORTS

N. Post-Construction Care

- i. Operation and maintenance (O&M) plan
- ii. Land use restrictions (if applicable)

O. Post-Construction Surveying and Engineer's Report

P. Cost Estimates

Q. Public Notification

R. References

S. Tables

T. Figures

U. Appendices

- i. Engineering drawings
- ii. Engineering calculations
- iii. Specifications
- iv. Quality assurance / quality control (QA/QC) program

4. REMEDY IMPLEMENTATION COMPLETION REPORTS

A. Introduction

- i. Site description and history
- ii. RAP description

B. Site Preparation Activities

C. Remedial Activities

D. Field Variances

E. Monitoring

F. Data Interpretation

- i. Mass removal estimates by constituent and phase
- ii. Evaluation of goal attainment

G. Waste Characterization and Disposal

H. Summary and Conclusions

I. References

J. Figures

K. Tables

L. Appendices

- i. As-built drawings
- ii. Construction photographs
- iii. Material certifications
- iv. Laboratory analytical data
- v. Quality assurance of laboratory data
- vi. Geotechnical test data
- vii. Waste manifests and weight tickets
- viii. Disposal locations and documentation

5. SITE INVESTIGATION WORK PLANS

A. Introduction

- i. Site location and description
- ii. Purpose and scope of work plan
- iii. Responsible agency
- iv. Project organization

B. Site Background

- i. Site history, operations and features
- ii. Topography, climate, and setting
- iii. Geology and hydrogeology
- iv. Surface water hydrology

C. Previous Investigations and Remedial Activities

- i. Previous Investigations
- ii. Background concentrations (if known)
- iii. Contaminants of concern
- iv. Previous remedial measures
- v. Summary of investigation results

D. Project Objectives/Data Quality Objectives and Approach

- i. Project objectives and data quality objectives
- ii. Project approach
- iii. Conceptual Site Model

- iv. Data gaps

E. Scope of Work for Investigation

- i. Nature and Extent of Contamination
 - a. Objectives
 - b. Sampling design and rationale
 - c. Sample locations and depths
- ii. Remedy Evaluation and Design
 - a. Objectives
 - b. Sampling design and rationale
 - c. Sample locations and depths
- iii. Background Concentrations of Metals (if applicable)
 - a. Objectives
 - b. Sampling design and rationale
 - c. Sample locations and depths
- iv. Sampling and Analysis
 - a. General sample collection procedures and preservation methods
 - b. Laboratory analytical methods
 - c. QA/QC

ATTACHMENT B—MANDATORY CONTENTS FOR WORK PLANS AND REPORTS

- v. Data Management, Evaluation and Reporting
 - a. Data Management
 - b. Data Evaluation
 - (1) General data evaluation
 - (2) Statistical methodology
 - c. Reporting

F. Project Schedule

G. References

H. Tables

I. Figures

J. Appendices

- i. Field Sampling Plan (FSP)
- ii. Quality Assurance Project Plan (QAPP)
- iii. Site-specific HASP
 - a. Waste Management Plan
 - b. Central Valley Water Board Staff Data Gap Tech Memo
 - c. Maps and Diagrams of Site

6. SITE INVESTIGATION SUMMARY REPORTS

A. Introduction

- i. Site investigation objectives
- ii. Site description
- iii. Site background
 - a. History of site
 - b. Previous investigations
 - c. Contaminants of concern
 - d. Community concerns

B. Site Geology, Hydrogeology, and Hydrology

- i. Geologic setting
- ii. Stratigraphy

- iii. Hydrogeology
- iv. Surface water hydrology

C. Site Investigation Summary

- i. Investigation objectives
- ii. Analytical methods
- iii. Field activities
 - a. Location of samples
 - b. Sampling strategies
 - c. QA/QC

**D. Background Concentrations
(if applicable)**

- i. Criteria for identification of background
- ii. Lithology / soil type / groundwater zone
- iii. Analysis methods
- iv. Site-specific background range

E. Investigation Results

- i. Nature and extent of contamination
- ii. Areas of concern
- iii. Conceptual site model

- iv. Data for remedy design and evaluation

F. Summary and Conclusions

- i. Constituents of concern
- ii. Areas of concern

G. Recommendations

H. Tables

I. Figures

J. Appendices

- i. Human and Ecological Risk Evaluations

7. MONITORING PLANS

A. Introduction

- i. Site description
- ii. Purpose and objectives of monitoring
- iii. Monitoring program activities
 - a. Inspections
 - b. Surface water sampling
 - c. Groundwater monitoring
- iv. Monitoring System Description
- v. Groundwater
- vi. Surface water

B. Pre-Sampling Activities

C. Sample Collection

D. Sample Handling

E. Decontamination / Equipment Handling

F. Laboratory and Field QA/QC

G. Equipment Calibration

H. Record Keeping

I. Reporting

J. Monitoring Network O&M

K. Health and Safety

L. References

M. Tables

N. Figures

O. Appendices

- i. FSP
- ii. QAPP

8. ANNUAL REMEDIAL STATUS REPORTS

A. Current remedial phase

B. Deliverable status

C. Cleanup status (mass removed, etc.)

D. Gantt chart (detailed schedule of project tasks and subtasks)

E. Assessment of remedy performance

F. Issues identified that affect remedial schedule and performance

G. Recommendations for modifications to remedial strategy

H. Recommendations for next phase of remediation

CLEANUP AND ABATEMENT ORDER R5-2019-0713
UNION PACIFIC RAILROAD CO.
DUNSMUIR RAILYARD, NORTH FUELING FACILITY
SISKIYOU COUNTY

ATTACHMENT C

MONITORING AND REPORTING PROGRAM

(MRP begins on next page)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2019-0713
FOR
UNION PACIFIC RAILROAD COMPANY
DUNSMUIR RAILYARD, NORTH FUELING FACILITY
5750 SACRAMENTO AVENUE, DUNSMUIR, CALIFORNIA
SISKIYOU COUNTY

The Executive Officer of the Central Valley Regional Water Quality Control Board (Central Valley Water Board) finds as follows:

1. This Order is issued pursuant to Water Code section 13267, subdivision (b)(1), in conjunction with Cleanup and Abatement Order R5-2019-0713 (CAO) to Union Pacific Railroad Company (UPRR) for the Dunsmuir Railyard, North Fueling Facility (Site). A Map of the Site is attached as **Attachment A** to the CAO, and incorporated herein.
2. The Monitoring and Reporting Program (MRP) established herein is supported by **CAO Findings 1-39 and 55-61**, which are fully incorporated herein.
3. The monitoring and reporting activities required herein are necessary to ensure compliance with the operative CAO. The burdens of compliance are reasonable in relation to the need for monitoring and reporting outlined in the CAO findings.
4. As depicted in CAO Attachment A, there are currently 18 monitoring wells, 21 piezometers, and 33 “grout tubes” associated with the Site.
5. This Order is separately-issued, and may be revised independently of the CAO. Any revisions to this MRP shall be controlling over the provisions attached to the CAO.
6. The issuance of this Order, which pertains to information collection and environmental protection, is exempt from the California Environmental Quality Act (CEQA), Public Resource Code section 21000 et seq., in accordance with the CEQA Guidelines. (See Cal. Code Regs., tit. 14, §§ 15306, 15308.)

IT IS HEREBY ORDERED that, pursuant to Water Code section 13267, subdivision (b)(1), UPRR shall comply with the following requirements.

A. MONITORING REQUIREMENTS

<u>Activity</u>	<u>Frequency</u>
Groundwater Monitoring (§ A.1)	See Table 1.
Surface Water Monitoring (§ A.2)	See Table 3.
Site Monitoring (§ A.3)	Twice-Weekly and Prior to Forecasted Storm Events

(Tables 1-4 follow the signature page of this Order.)

1. Groundwater Monitoring

UPRR shall immediately begin groundwater monitoring in accordance with the operative Monitoring Plan.

Existing monitoring wells, piezometers, and “grout tubes” shall be sampled according to the schedule in **Table 1**, with samples analyzed in accordance with the methods specified in **Table 2**.

In the event that any new wells are constructed to replace or supplement existing ones (e.g., to address any CAO requirements), such wells shall be sampled in accordance with **Table 1**.

2. Surface Water Monitoring

UPRR shall immediately begin surface water monitoring in accordance with the operative Monitoring Plan.

Surface water samples shall be collected according to the schedule in **Table 3**, and analyzed by the methods in **Table 4**.

3. Site Monitoring

UPRR shall conduct routine inspections, at least twice a week and in advance of forecasted storm events, to determine the presence of oil, oil sheen, or other signs of contaminant discharge in or near the Sacramento River. The observations shall be recorded and submitted with the monthly report.

The minimum inspection frequency will continue until the Assistant Executive Officer determines that a reduced sampling frequency is appropriate and this MRP is revised, accordingly.

B. REPORTING REQUIREMENTS

UPRR shall submit the monitoring reports on a monthly, quarterly and annual basis, and in accordance with the provisions below, until otherwise directed in writing by the Assistant Executive Officer.

<u>Report</u>	<u>Due</u>
Quarterly Reports (§ B.1)	1 May (1st Qtr.)
	1 August (2nd Qtr.)
	1 November (3rd Qtr.)
	1 February (4th Qtr.)
Monthly Reports (§ B.3)	10th Day of Following Month (e.g., May Report due 10 June)
Annual Reports (§ B.2)	1 February

1. Quarterly Monitoring Reports

- a. Beginning with the Monitoring Report for the 2nd of Quarter 2019 (due 1 Aug. 2019), UPRR shall submit Quarterly Monitoring Reports in accordance with the following schedule:

<u>Quarter</u>	<u>Report Deadline</u>
1st Quarter (1 Jan.–30 Mar.)	1 May
2nd Quarter (1 April–30 June)	1 August
3rd Quarter (1 July–30 Sept.)	1 November
4th Quarter (1 Oct.–31 Dec.)	1 February

- b. Each Quarterly Monitoring Report shall contain the following information:
 - i. A description and discussion of the groundwater, surface water, and “grout tube” sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected, and whether the pollutant plume is delineated;
 - ii. Field logs for groundwater sampling that contain, at a minimum, water quality parameters measured before, during, and after well purging, method of purging, depth of water, volume of purged water, presence and thickness of nonaqueous phase liquid (NAPL) (product or sheen), well condition, recommendations for well maintenance;
 - iii. Field logs for surface water sampling that contain, at a minimum, water quality parameters measured at the time of sampling, sampling method, river flow conditions, and presence of NAPL (product or sheen);
 - iv. Groundwater contour maps and corresponding Sacramento River stage elevation, as appropriate;
 - v. Pollutant concentration contour maps by constituent;
 - vi. Pollutant observation maps (NAPL/product presence in wells, piezometers, “grout tubes” and on surface of retaining wall and walkway);
 - vii. A table showing well construction details such as well number, groundwater zone being monitored, coordinates (latitude/longitude), ground surface elevation, reference elevation, elevation of screen, well details);
 - viii. A table showing historical lateral and vertical (if applicable) flow directions and gradients;
 - ix. Cumulative data tables containing the water quality results for surface water and groundwater;
 - x. Cumulative data tables for depth to groundwater;
 - xi. A copy of laboratory analytical data reports;
 - xii. The status of any ongoing remediation, including an estimate of the cumulative mass of pollutant removed from the

subsurface, any associated field notes, and documentation of contaminated media transportation and disposal (e.g., soil manifests, weight tags); and

- xiii. A summary of any deviations from the procedures identified in the Monitoring Plan.
- c. UPRR shall continue the submission of Quarterly Monitoring Reports until the Assistant Executive Officer determines in writing that such reports are no longer necessary.

2. Annual Monitoring Reports

- a. Beginning with the 2019 Annual Monitoring Report, UPRR shall submit Annual Monitoring Reports on **1 February** of each year. These reports shall provide evaluation of the overall effectiveness and progress of the investigation and remediation activities at the Site.
- b. Annual Monitoring Reports shall contain the following information:
 - i. Both tabular and graphical summaries of all data obtained during the reporting year;
 - ii. Groundwater contour maps, pollutant concentration maps, and NAPL/product distribution maps containing all data obtained during the reporting year,
 - iii. A discussion of the long-term trends in the concentration and presence of pollutants in the groundwater monitoring wells, piezometers, "grout tubes", and Sacramento River; and
 - iv. If desired, a proposal and rationale for any revisions to the sampling plan frequency and/or list of analytes.

3. Monthly Reports

- a. Beginning with the Report for June 2019 (due 10 July 2019), UPRR shall submit Monthly Reports on the **10th day of the following month** (e.g., July Report due 10 Aug.). These reports shall provide an overall summary of all monitoring activities conducted at the Site.

- b. Monthly Reports shall include the following:
 - i. Tables with groundwater elevations and NAPL/product presence/thickness;
 - ii. Photographs from walkway observations;
 - iii. Thickness of NAPL/product in “grout tubes” reported;
 - iv. Field forms;
 - v. A summary of Site conditions; and
 - vi. Update on the status of interim NAPL control measures, site investigation, and remedial tasks, including issues that may affect the project schedule.

C. OTHER REQUIREMENTS

1. Electronic Submission

- a. All reports and laboratory data shall be uploaded to State Water Board’s **GeoTracker** Database (<http://geotracker.swrcb.ca.gov>). (See Cal. Code Regs., tit. 23, § 3890 et seq.)
 - i. Analytical laboratory data for soil, vapor, and water samples shall be saved/submitted as **Electronic Deliverable Format (EDF)**.
 - ii. Site Maps (i.e., GEO_MAP), boring/well survey information, depth to groundwater, boring logs and well screen intervals, location data (i.e., GEO_XY file), elevation data (i.e., GEO_Z file), and technical reports (e.g. work plans, assessment, and monitoring reports) shall be saved/submitted in searchable **Portable Data Format (PDF)**.

- b. After each upload to GeoTracker, notify Central Valley Water Board staff via email (centralvalleyredding@waterboards.ca.gov), including the following information in the email body:

Attention:	Groundwater Unit
Report Title:	--
GeoTracker Upload ID:	--
Discharger Name:	Union Pacific Railroad Co.
Facility Name:	Dunsmuir Railyard, North Fueling Facility
County:	Siskiyou
CIWQS place ID:	220849

2. Mandatory Contents and Formatting

- a. Monitoring Reports shall be accompanied by a transmittal letter with the following certification from an authorized UPRR representative:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted, to the best of my knowledge and belief, is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

- b. Reported data shall be arranged in **tabular form** so as to render readily discernable all dates, sample types (e.g., run-on, outflow) and reported analytical results for each sample; and summarized in such a manner to clearly illustrate compliance with this Order.
- c. Results of any monitoring done more frequently than required at locations specified herein shall be included in the next regularly-submitted report.
- d. In accordance with Business and Professions Code sections 6735, 6835 and 7835.1, work plans and technical or implementation reports containing geologic or engineering evaluations and/or

judgments be performed under the direction of an appropriately licensed or certified professional. Please ensure that all documents that contain site specific data, data interpretations, or recommendations comply with this requirement and that they include the professional license stamp, signature and statement of professional certification (i.e., California Professional Geologist or California Professional Engineer).

- e. Laboratories analyzing monitoring samples shall be California-certified laboratories (see Wat. Code, § 13176), and include quality assurance/quality control data with their reports.

This Order is effective as of the date below.

ORDERED BY:

Original signed by

PATRICK PULUPA, Executive Officer,
Central Valley Water Board

11 June 2019

DATE

MRP Glossary

Table 1—Groundwater Sampling Frequencies and Constituent Suites

Table 2—Groundwater Analytical Methods

Table 3—Surface Water Sampling Frequencies and Constituent Suites

Table 4—Surface Water Analytical Methods

MRP GLOSSARY

CAO	Cleanup and Abatement Order R5-2019-0713 (and any subsequent revisions thereto)
µg/L	Microgram per Liter
mg/L	Milligram per Liter
mV	Millivolts
NAPL	Non-Aqueous Liquid Phase
NTU	Nephelometric Turbidity Unit
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
TPH	Total Petroleum Hydrocarbons
TPH[d/o/g]	Total Petroleum Hydrocarbons [as Diesel / Oil / Gasoline]
µS/cm	MicroSiemens per centimeter
VOC(s)	Volatile Organic Compound(s)

MRP TABLES

Table 1—Groundwater Sampling Frequencies and Constituent Suites

	<u>Suite A</u>	<u>Suite B</u> ³	<u>Suite C</u> ²	<u>Suite D</u> ¹	<u>Suite E</u> ¹
MWX-02S	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-04	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-06	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-07	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-08	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-09	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-11	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-11S	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDMW-13	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDMW-14	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDMW-15	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDMW-16	--	--	--	--	Every 5 Yrs.
NDMW-17	Quarterly ⁵	Quarterly ⁵	Quarterly ⁵	Quarterly ⁵	Every 5 Yrs.
NDMW-18	--	--	--	--	Every 5 Yrs.
NDPZ-01	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-02	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-03	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-04	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-05	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-06	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDPZ-07	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-08	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-09	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDPZ-10	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.

	<u>Suite A</u>	<u>Suite B</u> ³	<u>Suite C</u> ²	<u>Suite D</u> ¹	<u>Suite E</u> ¹
NDPZ-11	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-12	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-13	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
NDPZ-14	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-15A	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-15B	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-16A	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-16B	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-17A	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-17B	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
NDPZ-18	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
PT-01	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
PT-03	Quarterly ⁵	--	--	Quarterly ⁵	Every 5 Yrs.
SP-04	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
SP-04S	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
All New and Replacement Wells	Quarterly	Quarterly	Quarterly	Quarterly	Every 5 Yrs.
Grout Tubes	Monthly ⁴	--	--	--	--

1. If NAPL is present in a given well or piezometer at the time of sampling, the collected sample need not be analyzed per Suite D (quarterly) or Suite E (every 5 years).
2. Except as otherwise directed in writing by the Assistant Executive Officer, "Suite C" analyses (for PAHs & PCBs) may be discontinued for a well after 4 consecutive sampling events without detection.
3. Except as otherwise directed in writing by the Assistant Executive Officer, "Suite B" analyses may be discontinued for particular VOCs and metals for a given well after 4 consecutive sampling events without detection of the particular VOC or metal constituent.
4. Grout tube monitoring is only required to the extent site conditions allow safe access to grout tubes.
5. Prior to the issuance of this MRP, the Responsible Party requested elimination of quarterly monitoring (per Suite A and Suite D) for the following wells and piezometers: NDMW-11S; NDMW-13; NDMW-14; NDMW-17; NDPZ-01; NDPZ-02; NDPZ-03; NDPZ-04; NDPZ-05; NDPZ-07; NDPZ-08; NDPZ-10; NDPZ-11; NDPZ-12; NDPZ-14; NDPZ-15A; NDPZ-15B; NDPZ-16A; NDPZ-16B; NDPZ-17A; NDPZ-17B; NDPZ-18; and PT-03. To the extent that the Responsible Party still seeks the discontinuance of any monitoring for these and other wells/piezometers, it shall submit a written request, supported by a technical justification, to the Assistant Executive Officer for approval.

Table 2—Groundwater Analytical Methods

Constituents	Method	Maxum Practical Quantitation Limit
Suite A		
NAPL or product presence or thickness	Visual	0.1 inches
Suite B		
TPHd, TPHo	8015M	50 µg/L
TPHg	8015M/8260M	50 µg/L
VOCs (benzene, toluene, ethylbenzene, xylenes, chlorinated solvents ²)	8260M	0.5 µg/L ³
Dissolved CAM 17 Metals	6010B	2 µg/L
Suite C		
PAHs	8270	0.05 µg/L ³
PCBs	8082A	1 µg/L
Suite D		
Groundwater Elevation	Water Level Meter or Transducer	±0.01 ft.
pH	Field Meter ¹	±0.1 std. units
Specific Conductivity	Field Meter ¹	±50 µS/cm
Temperature	Field Meter ¹	±0.1 °C
Dissolved Oxygen	Field Meter ¹	±0.2 mg/L
Oxidation/Reduction Potential	Field Meter ¹	±10 mV
Turbidity	Field Meter ¹	±1 NTU
Suite E		
Total Well Depth	Water Level Meter	±0.1 feet

µg/L—Microgram per Liter,

mg/L—Milligram per Liter,

mV—Millivolts,

NAPL—Non-Aqueous Liquid Phase,

NTU—Nephelometric Turbidity Unit,

PAHs—Polynuclear Aromatic Hydrocarbons,

PCBs—Polychlorinated Biphenyls,

TPH[d/o/g]—Total Petroleum Hydrocarbons [as Diesel/Oil/Gasoline],

µS/Cm—MicroSiemens per centimeter

VOCs—Volatile Organic Compounds

1. Field test instruments (e.g., pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions, as per the Monitoring Plan.
2. Until otherwise directed in writing by the Assistant Executive Officer, the Responsible Party shall analyze groundwater samples per “Suite B” for all chlorinated solvents associated with USEPA Method 8260M, including, but not limited to, Tetrachloroethylene (PCE), Trichloroethylene (TCE), cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene and Vinyl Chloride.
3. These PQLs are consistent with the Reporting Limits (RLs) in the Central Valley Water Board’s laboratory contract, effective August 2018. Alternative VOC and PAH PQLs may be used, provided that the alternative PQL is supported by a technical justification, and does not exceed applicable Title 22 MCLs (if any).

Table 3—Surface Water Sampling Frequencies and Constituent Suites

Sample Locations	Frequency	Constituent Suite(s)
Upstream River (3x) Downstream	Quarterly	A, B ¹ , C ² , D

1. Individual VOCs and metals analyzed may be removed from the monitoring list for a given location after four consecutive sampling events without detection in surface water samples from that location.
2. May be discontinued after four consecutive events without detections of these constituents.

Table 4—Surface Water Analytical Methods

Constituents	Method	Maximum Practical Quantitation Limit
Suite A		
TPHd, TPHo	8015M	50 µg/L
TPHg	8015M/8260M	50 µg/L
Suite B		
VOCs (benzene, toluene, ethylbenzene, xylenes, PAHs, chlorinated solvents ²)	8260B	0.5 µg/L ³
Dissolved CAM 17 metals	6010B	2 µg/L
Hardness	200.7	600 µg/L
Suite C		
PAHs	8270	0.05 µg/L ³
PCBs	8082A	1 µg/L
Suite D		
NAPL or product presence or thickness	Visual	n/a
pH	Field Meter ¹	±0.1 std. units
Specific Conductivity	Field Meter ¹	±50 µS/cm
Temperature	Field Meter ¹	±0.1°C
Dissolved Oxygen	Field Meter ¹	±0.2 mg/L
Turbidity	Field Meter ¹	±1 NTU

µg/L—Microgram per Liter,

mg/L—Milligram per Liter,

mV—Millivolts,

NAPL—Non-Aqueous Liquid Phase,

NTU—Nephelometric Turbidity Unit,

PAHs—Polynuclear Aromatic Hydrocarbons,

PCBs—Polychlorinated Biphenyls,

TPH[d/o/g]—Total Petroleum Hydrocarbons [as Diesel/Oil/Gasoline],

µS/Cm—MicroSiemens per centimeter

VOC(s)—Volatile Organic Compound(s)

1. Field test instruments (e.g., pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions, as per the Monitoring Plan.
2. Until otherwise directed in writing by the Assistant Executive Officer, the Responsible Party shall analyze surface water samples per "Suite B" for all chlorinated solvents associated with USEPA Method 8260M, including but not limited to, Tetrachloroethylene (PCE), Trichloroethylene (TCE), cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene and Vinyl Chloride.
3. These PQLs are consistent with the Reporting Limits (RLs) in the Central Valley Water Board's laboratory contract, effective August 2018. Alternative VOC and PAH PQLs may be used, provided that the alternative PQL is supported by a technical justification, and does not exceed applicable Title 22 MCLs (if any).