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A Report Prepared For:

California Regional Water Quality Control Board
San Francisco Bay Region
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Attention: Mr. Alec W. Naugle, P.G.

SUMMARY OF REMEDIAL INVESTIGATIONS, FEASIBILITY STUDY AND REMEDIAL ACTION PLAN NAPA PIPE FACILITY 1025 KAISER ROAD NAPA, CALIFORNIA

VOLUME 1 EXECUTIVE SUMMARY

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INTRODUCTION

The approximately 150-acre Napa Pipe Facility (Facility) is located about 3 miles south of the City of Napa along the east bank of the Napa River (Plate 1). Since the late 1930s the Facility has been used for industry – first shipbuilding, and later pipe and other steel fabrication activities. Napa Pipe Corporation ceased pipe fabrication in 2005. The property is now used for light industry and warehousing, with the exception of one tenant that continues steel fabrication in the northwest portion of the Facility. In late 2005, Napa Pipe Corporation sold the property to Napa Redevelopment Partners, LLC (NRP); plans are under way to redevelop for mixed residential, commercial and open space uses.

Industrial processes and operations at the Facility utilized a number of materials to fabricate the steel products, most notably hydraulic oils, diesel and solvents. These materials have been found in soil and groundwater at concentrations that require cleanup before the property can be redeveloped.

Environmental investigations of the Facility began in 1979 with oversight by the San Francisco Bay Regional Water Quality Control Board (RWQCB). Over the years, the RWQCB has issued orders to the Facility owner to address cleanup. Currently, Orders No. 90-147 and R2-2005-0012 focus attention on seven sites/areas within the Facility and sampling of a groundwater monitoring well network (see Plate 1 for locations). The sites/areas are as follows:

- Site 1: Southwest Fill Area - Class II Waste Management Unit;
- Site 2/3: Biocells, Southeast Storage Area Waste Piles, Abandoned Drainage Ditch, and External Coating Building;
- Site 4: Waste Water Treatment Pond, Two Underground Storage Tanks, Central and Western Area Chlorinated Volatile Organic Compounds and Petroleum Hydrocarbons from Unidentified Source(s), and Pipe Mill;
- Site 5: Materials Storage; Painting Operations;
- Site 6: Machine Shop and Former Drum Storage Area; and
- Site 7: Background Site.

Site 1 is permitted and maintained as a Class II Waste Management Unit (WMU) and is expected to remain as such. Soil and groundwater investigations and/or prior remedial activities at Site 5; Site 7; portions of Site 2/3 (the former Pipe Storage Areas located at the Southeast Storage Area Waste Piles and the Abandoned Drainage Ditch); and the Waste Water treatment pond area of Site 4 have indicated that these areas are absent of substantial environmental impacts. Those areas are not subject to on-going regulatory oversight, and active remedial action measures are not anticipated for those portions of the Facility at this time. Site 7 is hydrogeologically upgradient of the other six sites; no environmental issues have been identified for this site and it is considered to represent background soil and groundwater conditions.

To complete the investigation and cleanup process and there by facilitate redevelopment of the Facility, this remedial investigation, feasibility study and remedial action plan report (RI/FS/RAP) addresses the remainder of the Facility: Sites 2/3, 4, and 6 and "Other Areas". The Other Areas site includes four areas (Fabrication Buildings, Double Ender Building, Internal Coating Building and Acid Drain Line) that were not defined as sites in the RWQCB Orders and where industrial activities have formerly taken place. A remedial investigation report, feasibility study evaluation and a proposed remedial approach for each of these sites is presented in a separate volume, as follows: Volume 2: Site 2/3 (External Coating Building Area); Volume 3: Site 4 (Former Pipe Mill Building, Maintenance Garage, Paint Storage Building); Volume 4: Site 6 (Former Machine Shop, Former Drum Storage Area and Southeastern Portion of Fabrication Buildings); and Volume 5: Other Areas (Fabrication Buildings, Double Ender Building, Internal Coating Building and Acid Drain Line). Each volume presents a summary of investigations conducted at each of the sites to delineate the limits of the contamination, evaluate alternatives to clean up the soil and groundwater and present the recommended cleanup alternative.

This Volume 1 does not focus on a specific area or site, rather it provides a Facility-wide overview. The following topics, which are addressed at length for each site/area in Volumes 2 through 5, are generally discussed and summarized below.

- Previous remedial investigations conducted at the sites;
- Supplemental remedial investigations completed in September through March 2007;
- Chemicals to be remediated in soil and groundwater and associated cleanup levels, and the extent and volume of contamination requiring cleanup;
- Applicable remedial technologies and alternatives;
- The preferred remedial alternative; and
- The tasks necessary to implement the recommended remedial action.

REMEDIAL INVESTIGATION

The Remedial Investigation (RI) is designed primarily to identify the nature and extent of the contamination in soil and groundwater, among other information. Prior to NRP's purchase of the Facility in December 2005, the Napa Pipe Corporation and other prior Facility owners had collected over 330 samples of soil and groundwater from 207 locations; conducted 67 groundwater monitoring well sampling rounds; analyzed samples for over 1,100 chemical tests, including petroleum hydrocarbons, volatile organic compounds (VOCs), semivolatile organic compounds, PCBs and metals; studied the geology and hydrogeology; and initiated cleanup at numerous accessible areas. The prior cleanups (five in all) focused on activities that were feasible for an active industrial property while still protective of human health and the environment. In many buildings, investigation/cleanup could not be initiated because the industrial equipment or operations limited access.

At most areas of the Facility, industrial operations have since ceased allowing for access to the industrial buildings. With oversight by the RWQCB, extensive additional sampling has recently been completed. Approximately 550 soil and groundwater samples were collected from over 350 locations at Site 2/3, Site 4, Site 6 and Other Areas in Fall 2006/Winter 2007. Soil samples were collected from both shallow and deep horizons (up to approximately 13 feet below the ground surface). In addition, two groundwater sampling rounds were conducted on the existing groundwater monitoring well network. In total, over 1,600 chemical tests were conducted on these soil and groundwater samples, including analysis for petroleum hydrocarbons, volatile organic compounds, metals and pH. The purpose of these investigations was to find out if the formerly inaccessible areas were contaminated, and to better understand the limits of the known contamination.

These supplemental and prior investigations have found that petroleum products such as diesel, motor oil and hydraulic oil, and various VOCs such as solvents, and locally, metals, are present in soil and/or groundwater. The RWQCB's Environmental Screening Levels (ESLs) (which are conservative chemical concentrations below which chemical test results are deemed safe for human health and the environment) were used to put the raw soil and groundwater data in context. Table 1 summarizes what was found at each of the Sites, including the quantities of shallow (dry) soil and water-saturated soil/groundwater that will require cleanup. In total, approximately 122,000 cubic yards of soil/groundwater will require cleanup. Visually, the areas that will be cleaned in preparation for development are shown on Plates 3 and 4. Plate 3 depicts areas where shallow unsaturated (dry) soils (0 to 4 feet below ground surface [bgs]) require cleanup. Plate 4 depicts areas where water saturated soil (4 to 10 feet bgs) and groundwater is contaminated at levels requiring cleanup.

REMEDIATION FEASIBILITY STUDY

The remedial feasibility study (FS) process, as defined by the U.S. Environmental Protection Agency (USEPA), is designed to evaluate a range of reasonable remedial alternatives, including treatment and non-treatment options. Following EPA guidance, and as documented in detail in Volumes 2 through 5, the FS process for the Facility has developed remedial actions to cleanup chemicals in soil and groundwater, primarily petroleum hydrocarbons and VOCs. As the first step in that process, remedial action objectives (RAOs) were developed for the cleanup. These are:

- Reduce concentrations of chemicals in soil and groundwater to below cleanup levels to the maximum extent practicable; and

- Minimize the use and reliance on institutional and/or engineering controls to the extent practicable.

The proposed cleanup levels were based on RWQCB ESLs and are conservative levels protective of human health and the environment. For each chemical, the proposed cleanup levels are as follows:

Soil:

Parameter	Residential ESL Shallow Soil (0-3 ft. bgs) (mg/kg)	Residential ESL Shallow Soil (3-10 ft. bgs) (mg/kg)	Residential ESL Deep Soil (>10 ft. bgs) (mg/kg)
Diesel	100	400	5,000
Motor Oil/Hydraulic Oil	500	1,000	5,000
Naphthalene	0.46	0.46	0.46
1,1-Dichloroethane	0.32	0.32	0.32
Arsenic*	5.5	5.5	5.5
Cobalt*	10	10	10
Selenium	10	10	2,500

* = Background metals concentrations may be used to evaluate if cleanup has been attained.
mg/kg = milligrams per kilogram.

Groundwater:

Parameter	Nondrinking Water ESL (μg/l)
Diesel	2500
Motor Oil/Hydraulic Oil	2500
Naphthalene	210
Vinyl Chloride	3.8
Anthracene	22
Fluorene	950
Methylnapathalene	100
Phenanthrene	410
1,1-Dichloroethane	1,000
1,1-Dichloroethylene	6,300
Chloroethane	160
Toluene	400
Trichloroethylene	530

μg/l = micrograms per liter.

The second step in the FS process was to develop a list of general cleanup activities that could be used to address the problem: no action, institutional and engineering controls, and active remediation (both in the ground [i.e., *in-situ*] and on the ground surface after removal of the contaminated material [i.e., *ex-situ*]). A preliminary list of fourteen soil and ten groundwater treatment technologies were identified as potentially viable technologies. Following EPA protocol, each technology was then screened on the basis of effectiveness, implementability and cost. From this evaluation, a list of remedial technologies that could be used to cleanup the soil and groundwater at the Facility were retained for further detailed analysis. These technologies included:

Technologies for Soil Cleanup

- Excavation;
- *Ex Situ* Low Temperature Thermal Desorption (soil is heated to drive off the chemicals, then treat the chemicals);
- Bioremediation (using bacterial treatment in piles or by landfarming);
- Off-Site Disposal (in a landfill); and
- *In Situ* Chemical Oxidation (using chemicals to treat the contamination in place).

Technologies for Groundwater Cleanup

- *In Situ* Enhanced Bioremediation (injection of additives to promote biological growth and associated contaminant degradation);
- *In Situ* Chemical Oxidation (injection of chemicals to treat the groundwater in place);
- Saturated Soil Excavation*;* and
- Existing Wastewater Treatment System (used to treat contaminated water).

Following EPA guidance, the technologies retained from the screening process were then assembled into remedial alternatives. Four remedial alternatives were developed:

- **Alternative 1 – No Action**: No cleanup of soil or groundwater would be conducted and no additional groundwater monitoring would be conducted (existing groundwater monitoring wells are decommissioned). The no action alternative is a baseline alternative, used as a comparison benchmark for the other alternatives;
- **Alternative 2 – Maintain Existing Remedial Actions**: the status quo is maintained via continued groundwater monitoring, groundwater extraction (at Sites 2/3 and 6), and monitored natural attenuation (MNA; Site 4) as specified in the existing RWQCB

orders and prior cleanup plans. No new cleanup of the soils or groundwater would be initiated;

- **Alternative 3 – *Ex Situ* Source Area Soil and Groundwater Treatment and *In situ* Groundwater Plume Remediation**: Consists of two major components: (1) excavation and *ex situ* treatment of source area saturated and unsaturated soils and groundwater and (2) *in situ* treatment of groundwater exceeding cleanup levels, but outside of the source area. The excavation of the source area would be conducted first in order to both remove the source contaminants and also to induce the surrounding contaminated groundwater to flow into the excavation through dewatering activities. The dewatering would remove some of the contaminated groundwater for treatment and the induced groundwater flow into the excavation would assist in the distribution of the chemical oxidants to be used in the *in situ* treatment phase of the remediation; and

- **Alternative 4 – *Ex Situ* Soil and Groundwater Remediation**: Excavation and *ex situ* treatment of all saturated and unsaturated soils and groundwater that exceed their respective cleanup levels. A "tool-box" of treatments would be applied to the excavated soils (depending on the volume and characteristics of the soils) including biological treatments (bio-piling, landfarming), low temperature thermal desorption, and off-site disposal.

Each of these remedial alternatives was then evaluated against nine standard evaluation criteria, as required by state and federal regulation and guidance. These nine criteria are divided into three categories: "Threshold Criteria," "Primary Balancing Criteria," and "Modifying Criteria." The nine evaluation criteria are described below.

Threshold Criteria

- **Overall Protection of Human Health and the Environment.** Addresses whether a remedial alternative is protective of human health and the environment considering long-term and short-term site-specific characteristics. The remedy's short-term effectiveness, long-term effectiveness and permanence, and ability to reduce chemical toxicity, mobility, and volume affect the evaluation under this criterion. This criterion considers the degree of certainty that an alternative can meet the site-specific remedial action goals; and

- **Compliance with Applicable or Relevant and Appropriate Requirements.** The remedial alternatives must comply with Applicable or Relevant and Appropriate Requirements (ARARs).

Balancing Criteria

- **Long-Term Effectiveness and Permanence.** Addresses how well a remedy maintains protection of human health and the environment after the site-specific remedial goals have been met to the extent feasible. Components to be addressed include the magnitude of residual risk, the adequacy and long-term reliability of institutional controls and containment systems, and potential consequences should the remedy or some portion of it fail;

- **Reduction of Mobility, Toxicity, or Volume.** The anticipated amount of the chemical of concern destroyed or treated and the amount remaining at the site are assessed, along with the degree of expected reduction in chemical mobility, toxicity, or volume;

- **Short-Term Effectiveness.** Concerns protection of human health and the environment during construction and implementation of the remedy;

- **Implementability.** Implementability considers both the technical and administrative feasibility of implementation. The criterion also considers the ability to construct and operate remedial facilities, ease of undertaking additional remedial actions, ability to monitor remedial effectiveness, and the ability to obtain necessary approvals and permits; and

- **Cost**. The costs to be assessed include the capital cost, annual operation and maintenance costs. Per regulatory agency guidance, cost estimates are considered accurate to a range of minus 30% to plus 50% of the estimated cost.

Modifying Criteria

- **State Acceptance.** The State Acceptance criterion incorporates input from California agencies to modify the alternative selection process. This input can be obtained via formal comments received during the project comment period on this draft RI/FS/RAP document; and

- **Community Acceptance.** This criterion addresses reaction from the local citizenry. Comments from the community on this draft RI/FS/RAP are solicited during a 30-day comment period that is noticed in local newspapers.

The comparative evaluation of the alternatives against each of the criteria is shown in Table 2. A more detailed discussion is found in Section 10 of each of Volumes 2 through 5. Alternatives 1 and 2 compare poorly against the other two alternatives in all criteria (except cost) and, as such, are judged not acceptable alternatives for meeting the remedial action objectives.

Comparing Alternatives 3 and 4, they are very similar in their ability to meet the cleanup objectives. Both compare favorably to the evaluation criteria, and both meet the remedial action objectives for the Site.

Although the estimated cost of Alternative 4 is approximately $660,000 less than Alternative 3, these alternatives have somewhat similar costs, particularly in light of the +50/-30 level of accuracy for cleanup cost estimates under EPA guidance. The most significant difference between the two alternatives is related to the *in situ* chemical oxidation component of Alternative 3. Soils at the Facility are fine-grained and are layered; there may be some difficulty in distributing the chemical oxidant throughout the soil. Uniform distribution of treatment chemicals is critical to effectively treat all of the contaminated soils/groundwater. Failure to uniformly distribute the oxidant could lead to partially treated, or even untreated, areas that would continue to act as sources of groundwater contamination.

Based on the evaluation of the four alternatives against the comparison criteria and the remedial action objectives, Alternative 4 is superior in terms of long-term effectiveness, permanence, and implementability. Although Alternative 3 would also likely achieve the cleanup objectives in a timely manner, the higher level of certainty associated with Alternative 4 and a lower cost compared to Alternative 3 leads to the recommendation of Alternative 4. The overall estimated cost of Alternative 4 is $9.82 million.

REMEDIAL ACTION IMPLEMENTATION

Alternative 4 generally consists of the excavation of a total of approximately 122,000 cy of saturated and unsaturated soils and groundwater that exceed their respective cleanup levels. The excavated soil would be segregated into categories and managed consistent with a soil management protocol to be developed as part of a Remedial Design and Implementation Plan (RDIP). Where treatment is required to achieve cleanup levels prior to use of the soil as fill, technologies in the "tool box" would be utilized.

Excavation and Treatment of Soils and Groundwater

In general, the initial excavations would be the unsaturated soils exceeding residential cleanup levels and the clean overburden, followed by the saturated zone soils. Excavations will be dewatered and the water will be collected and treated onsite using the existing wastewater treatment system prior to discharging to the sanitary sewer under the Facility's existing permit.

Contaminated soils will be segregated into categories based on sample results and managed consistent with the soil management protocol. For soils requiring treatment prior to being used as backfill, the technologies retained in the "tool box" for treating soil *ex situ* include biopiling, landfarming, low temperature thermal desorption, and off-site disposal.

Following completion of excavation activities and confirmation, via sampling and analysis, that cleanup levels have been met, backfilling would proceed using a combination of recycled concrete and imported granular fill to the approximate elevation of the water table and then using clean overburden, clean imported fill, or potentially soils treated to below the residential cleanup levels. Amendments may be added to the backfill to promote enhanced biodegradation of contaminants in groundwater that flows back into the former excavation to prevent the recontamination of the clean backfill in the saturated zone.

Permits and Preparation

Prior to conducting the proposed remedial activities, all necessary permits will be obtained (e.g., Napa County grading permit) and all structures including underground utilities, buildings, foundations and floor slabs, paving, and materials stored or stockpiled in or near the Site would be demolished and/or removed. The permit process will include a CEQA (California Environmental Quality Act) review in conjunction with the redevelopment project, on which review will be under the auspices of Napa County. Equipment lay down and staging areas, soil stockpile areas, soil treatment areas, and areas where treated soil will be used as fill will also be prepared.

Verification of Cleanup

Verification soil samples will be collected from the excavations to evaluate whether the cleanup levels have been met. Details of the verification sampling plans will be included as part of the RDIP. Verification sample analyses will likely be performed utilizing an expedited laboratory turn-around schedule, or an on-site mobile laboratory, to reduce the likelihood for significant delays to affect the remedial action schedule.

In addition to verification soil sampling, it is anticipated that soil gas samples will be collected from shallow soil to confirm that residual contamination that may be present at depth, although below their respective soil or groundwater cleanup levels, is not causing an exceedance of a soil gas ESL. Should laboratory analytical results indicate that the cleanup goal has not been attained, additional excavation will be performed.

Dust Control and Decontamination

During shallow excavation activities, depending on soil conditions, there is potential to generate airborne dust. Therefore, as required, the contractor would apply a water mist to the excavation and soil handling and haul routes to reduce the potential for dust generation. Soil would be wetted as needed to reduce the occurrence of visible dust. Air monitoring would be conducted in accordance with local air quality management regulations.

Equipment used to excavate, transport, and manage the affected soil would be decontaminated prior to leaving the site. The decontamination area would be constructed in a central location that would be utilized for all remediation activities at the site. Decontamination wash water will be collected, characterized, treated on site using the existing wastewater treatment system, and discharged to the sanitary sewer.

Reporting

Following completion of remediation activities, a remedial action implementation report will be prepared and submitted to RWQCB for review and approval. The report will summarize the work that was performed, verification soil and soil gas sample analytical results, and document that the cleanup levels have been achieved. Performance monitoring results for soil treatment will be reported and the final disposition of excavated soils will be documented.

SCHEDULE

It is anticipated that the soil excavation for remediation would be completed during the 2008 construction season, approximately April through October, pending approval of this RI/FS/RAP, preparation of the RDIP, completion of the CEQA process, and issuance of the needed permits by the County and associated approvals. Approval of this document does not replace the County's normal environmental review associated with such permit(s) and related approvals. Depending on the total volume of soil requiring treatment from all the remediation areas and the specific type of treatment utilized, treatment of excavated soils may extend beyond 2008 into 2009.

Treatability studies to develop design information for select technologies would be implemented during 2007.

TABLES

Table 1
Summary of Findings
Remedial Investigation, Feasibility Study, Remedial Action Plan
Napa Pipe Facility
Napa, California

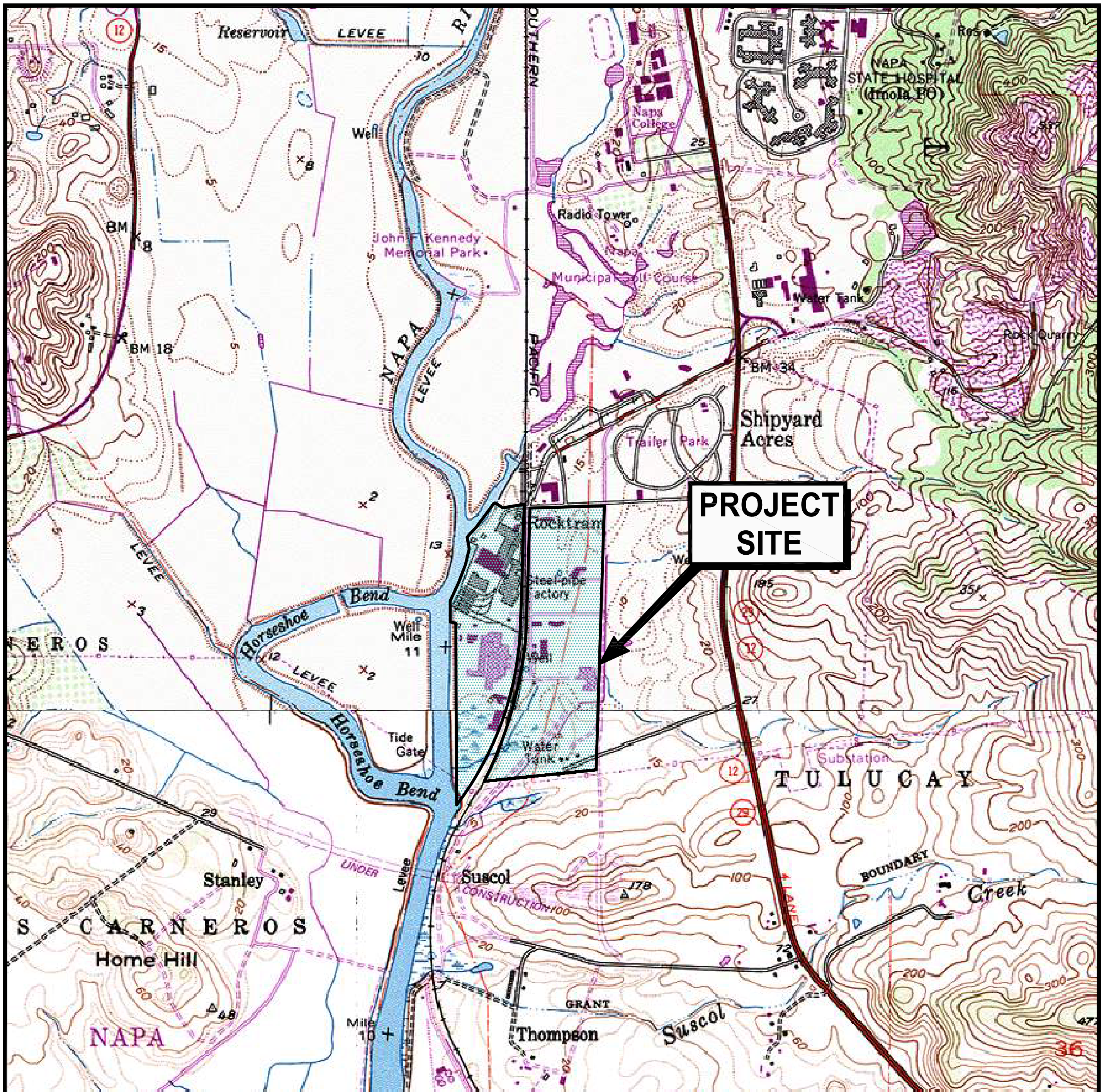
Site	Contaminants in Soil	Contaminants in Groundwater	Volume of Shallow (dry) Soil to be Cleaned Up (cubic yards)	Volume of Water-Saturated Soil/Groundwater to be Cleaned Up (cubic yards)
Site 2/3	diesel, motor oil, naphthalene	diesel, motor oil, naphthalene, vinyl chloride, anthracene, fluorene, methylnapthalene, phenanthrene	6,300	21,000
Site 4	diesel, motor oil, hydraulic oil, 1,1-DCA	diesel, motor oil, hydraulic oil, 1,1-DCA, 1,1-DCE, chloroethane, vinyl chloride, toluene	16,900	44,940
Site 6	motor oil, diesel	TPH-d, TPH-mo, TCE, vinyl chloride	6,000	17,900
Other Areas	diesel, motor oil, hydraulic oil, arsenic, cobalt, selenium	diesel, motor oil	790	8,200
		SUBTOTALS	29,990	92,040
		TOTAL (Soil and Groundwater)		**122,030**

Notes:
1,1-DCA = 1,1-dichloroethane
1,1-DCE = 1,1-dichloroethylene
TCE = trichloroethylene

Table 2
Evaluation of Remedial Alternatives
Napa Pipe Facility
Napa, California

Evaluation Criteria	Remedial Alternatives: Alternative 1 - No Action	Remedial Alternatives: Alternative 2 - Maintain Existing Remedial Actions	Remedial Alternatives: Alternative 3 - *Ex Situ* Source Area Treatment with *In Situ* Groundwater Remediation	Remedial Alternatives: Alternative 4 - *Ex Situ* Soil and Groundwater Remediation	Comparison of Alternatives
NCP Threshold Criteria					
Overall Protection of Human Health and the Environment	Not protective. Would leave chemicals in place above cleanup levels in both soil and groundwater.	Not protective for the range of foreseeable land uses. Would require long-term institutional and engineering controls to be protective. Would leave chemicals in place above residential-based cleanup levels in both soil and groundwater.	By reducing chemicals to below the risk-based cleanup levels, human health and the environment would be protected.	By excavating soil and groundwater with chemicals above cleanup levels and treating this soil and groundwater to below the risk-based cleanup levels, Alternative 4 would be protective of human health and the environment.	Alternatives 1 and 2 are not protective of human health and the environment. Both Alternatives 3 and 4 appear to offer similar high levels of protectiveness through aggressive treatment of contaminants.
Compliance With ARARs	Would not comply with ARARs related to protection of human health.	May not fully comply with some ARARs.	Alternative 3 is expected to comply with the applicable ARARs. Treatment technologies would be designed and implemented in compliance with applicable regulations and permit requirements.	Alternative 4 is expected to comply with applicable ARARs. Treatment technologies would be designed and implemented in compliance with applicable regulations and permit requirements.	Alternative 1 would not comply with ARARs. Alternative 2 would comply with the few applicable ARARs, but only through extensive use of institutional and engineering controls. Alternatives 3 and 4 would comply with ARARs to essentially the same degree.
NCP Primary Balancing Criteria					
Long-Term Effectiveness	Ineffective in the long-term as alternative does not achieve, nor maintain, protection of human health and the environment.	Ineffective in the long-term as alternative does not achieve cleanup levels in all but the longest term and requires institutional and engineering controls to maintain protection of human health and the environment.	Through a combination of excavating with *ex situ* treatment and *in situ* chemical oxidation, Alternative 3 would permanently reduce contaminant concentrations to below cleanup levels and would therefore be effective in the long-term.	By excavating soil and groundwater exceeding ESLs and treating them *ex situ* to destroy the contaminants, Alternative 4 would permanently reduce contaminant concentrations to below cleanup levels and therefore would be effective in the long-term.	Alternatives 1 and 2 would not be effective in the long-term. By significantly reducing contaminant concentrations in soil and groundwater, both Alternatives 3 and 4 would be effective in the long-term. By relying solely on excavation to remove contaminants from the subsurface, Alternative 4 would appear to achieve this with a higher degree of certainty as compared to Alternative 3 which uses *in situ* treatment.
Reduction of Mobility, Toxicity, Volume	Alternative 1 does not achieve reduction in contaminant mobility, toxicity, or volume.	Alternative 2 achieves limited reduction in contaminant mobility, toxicity, or volume via existing limited groundwater extraction systems and monitored natural attenuation.	The mobility, toxicity, and volume of contaminants would be effectively and significantly reduced through the use of treatment technologies in Alternative 3. The majority of the contaminant mass would be excavated and managed *ex situ*, thereby effectively eliminating the majority of contaminants from the subsurface. The remaining contaminants present in excess of cleanup levels would be treated *in situ* to below cleanup levels.	Alternative 4 would significantly reduce the mobility, toxicity, and volume of contaminants through the use of excavation and treatment. This approach would effectively eliminate the majority of contaminants from the subsurface.	Alternative 1 would not reduce contaminant mobility, toxicity, and volume. Over the long-term, Alternative 2 would achieve moderate reduction in contaminant mobility, toxicity, and volume via groundwater extraction, but would not address soil contamination. Both Alternative 3 and 4 would provide significant reductions through treatment, although Alternative 4 may achieve this more reliably compared to Alternative 3, as noted above.
Short-Term Effectiveness	Because there are no remedial activities to be implemented or constructed, there are very few short-term risks with this alternative.	There are few short-term risks with this alternative.	There are several potential short-term risks associated with implementing Alternative 3 that would need to be managed to maintain worker health and safety including risks associated with heavy excavation and earthmoving equipment, handling the chemical oxidants, potential vapors present during excavation and treatment operations, and risks related to the *ex situ* treatment technologies (e.g., LTTD). These risks can be effectively mitigated through careful design, appropriate use of health and safety procedures, personal protective equipment, and engineering controls during implementation.	As with Alternative 3, there are several potential short-term risks associated with implementing Alternative 4. These include risks associated with heavy excavation and earthmoving equipment, potential vapors present during excavation and treatment operations, and risks related to the *ex situ* treatment technologies (e.g., LTTD). These risks can be effectively mitigated through careful design, appropriate use of health and safety procedures, personal protective equipment, and engineering controls during implementation.	Alternatives 1 and 2 would have few if any short-term risks associated with their implementation. Both Alternatives 3 and 4 would have short-term implementation risks, but in general these are common construction-related concerns encountered at environmental remediation sites and would be easily mitigated through careful design and use of appropriate health and safety procedures. Alternative 3 may have a slightly higher short-term risk due to the use of large quantities of chemical oxidants for the *in situ* treatment component of this alternative.
Implementability	The no action alternative is technically implementable.	Alternative 2 is technically implementable.	The technologies utilized in Alternative 3 are generally well established and proven technologies. There are, however, implementability issues that need to be addressed to ensure the effectiveness of the remedial activities. Most notable of these are the issues related to *in situ* chemical oxidation, specifically potential problems with uniformly distributing the oxidant blend throughout the fine-grained soils of the treatment zone. Treatability studies would be performed to develop the appropriate injection approach and spacing and the correct oxidant dosing. Other less significant implementability issues include treatability studies for *ex situ* biological treatment and conducting significant excavations below the water table; these potential issues can be addressed during the design process. Administratively, the most significant implementability issues would likely be permitting requirements associated with the *ex situ* treatment technologies, most importantly the air permitting requirements for the low temperature thermal desorption unit.	Alternative 4 utilizes well established construction and treatment technologies with relative few implementability issues including: the need to conduct treatability studies to establish the design parameters for *ex situ* biological treatment and procedures for conducting significant excavations below the water table. These potential issues can be addressed during the design process and should not pose significant problems for implementation of Alternative 4. Permitting requirements for the soil treatment technologies, especially the air permitting requirements for the low temperature thermal desorption unit present the most significant administrative implementability concerns.	Although Alternatives 1 and 2 are technically implementable; they would not be administratively implementable. The excavation and *ex situ* components of Alternatives 3 and 4 would utilize the same construction and treatment technologies and therefore this aspect of these alternatives have identical implementability. The *in situ* component of Alternative 3 would present some potentially more significant implementability issues related to the difficulties in uniformly distributing the oxidant blend throughout the treatment zone, especially given the low permeability soils present at the Site. Bench and pilot scale treatability studies would help address this concern, but even then this aspect of Alternative 3 would make it's implementation somewhat less certain compared to Alternative 4. Administratively, the main issue for Alternatives 3 and 4 would be permitting requirements associated with the soil and groundwater treatment technologies, especially the LTTD unit.
Cost	There are little to no costs associated with the no action alternative.	Groundwater monitoring and extraction system operation for 20 years would cost approximately $ 3.7 million.	Average estimated capital costs for Alternative 3 are $9.86 million and O&M costs consisting of an estimated one year of groundwater monitoring and well abandonment total $606,000. The total estimated cost of this alternative is $10.48 million.	Average estimated capital costs for Alternative 4 are $9.82 million. There are no O&M costs. The total estimated cost of this alternative is $9.82 million.	Alternative 1 is by far the least costly, but does not achieve the comparison criteria or remedial objectives. Alternative 2, which only involves maintaining the existing monitoring and groundwater extraction systems, still would cost $3.7 million over 20 years. Within the accuracy of these feasibility study cost estimates, Alternatives 4 has an estimated cost of approximately $9.82 million, approximately $660,000 less than the estimated $10.48 million cost for Alternative 3.
NCP Modifying Criteria					
State Acceptance	Would not likely be accepted by State regulatory agencies.	Would not likely be accepted by State regulatory agency given the range of foreseeable land uses.	Given the protectiveness that would be achieved almost exclusively through contaminant treatment, it is expected that State agencies would accept this alternative.	Given the protectiveness that would be achieved almost exclusively through contaminant treatment, it is expected that State agencies would accept this alternative.	Alternatives 1 and 2 would not likely be acceptable to the State; they would not be protective nor comply with one or more of the applicable regulatory requirements. Given the protectiveness that would be achieved almost exclusively through contaminant treatment, both Alternatives 3 and 4 would likely be acceptable to the State.
Community Acceptance	Would not likely be accepted by public.	Would not likely be accepted by public given the range of foreseeable land uses.	Assuming that the short-term risks identified above can be addressed, it is anticipated that the community would accept this alternative due to its high level of protectiveness and permanence.	Potentially more acceptable to the community because all of the contaminants exceeding cleanup levels are removed and treated elsewhere instead of a portion of them being treated *in situ*.	Alternatives 1 and 2 would not likely be acceptable to the public. Alternatives 3 and 4 are anticipated to both be acceptable to the public given the aggressive approach to treating the contaminants and the cleanup levels achieved.
Summary of Evaluation for Alternatives	The no action alternative does not meet the NCP threshold, primary balancing, or modifying criteria.	Alternative 2 does not meet the NCP threshold, primary balancing, or modifying criteria.	Alternative 3 will meet both the threshold NCP requirements as well as most if not all of the balancing and modifying criteria. The one possible exception is the implementability concerns related to the *in situ* chemical oxidation. Treatability studies can be conducted to help address these concerns.	Alternative 4 appears to meet all of the NCP criteria with a high degree of certainty.	

ILLUSTRATIONS



0 2000 4000

Scale in Feet

N

U.S.G.S. Topo Map - Napa, California, 7.5-minute quadrangle. Map version1978; current as of 1980.
U.S.G.S. Topo Map - Cuttings Wharf, California, 7.5-minute quadrangle. Map version1978; current as of 1981.

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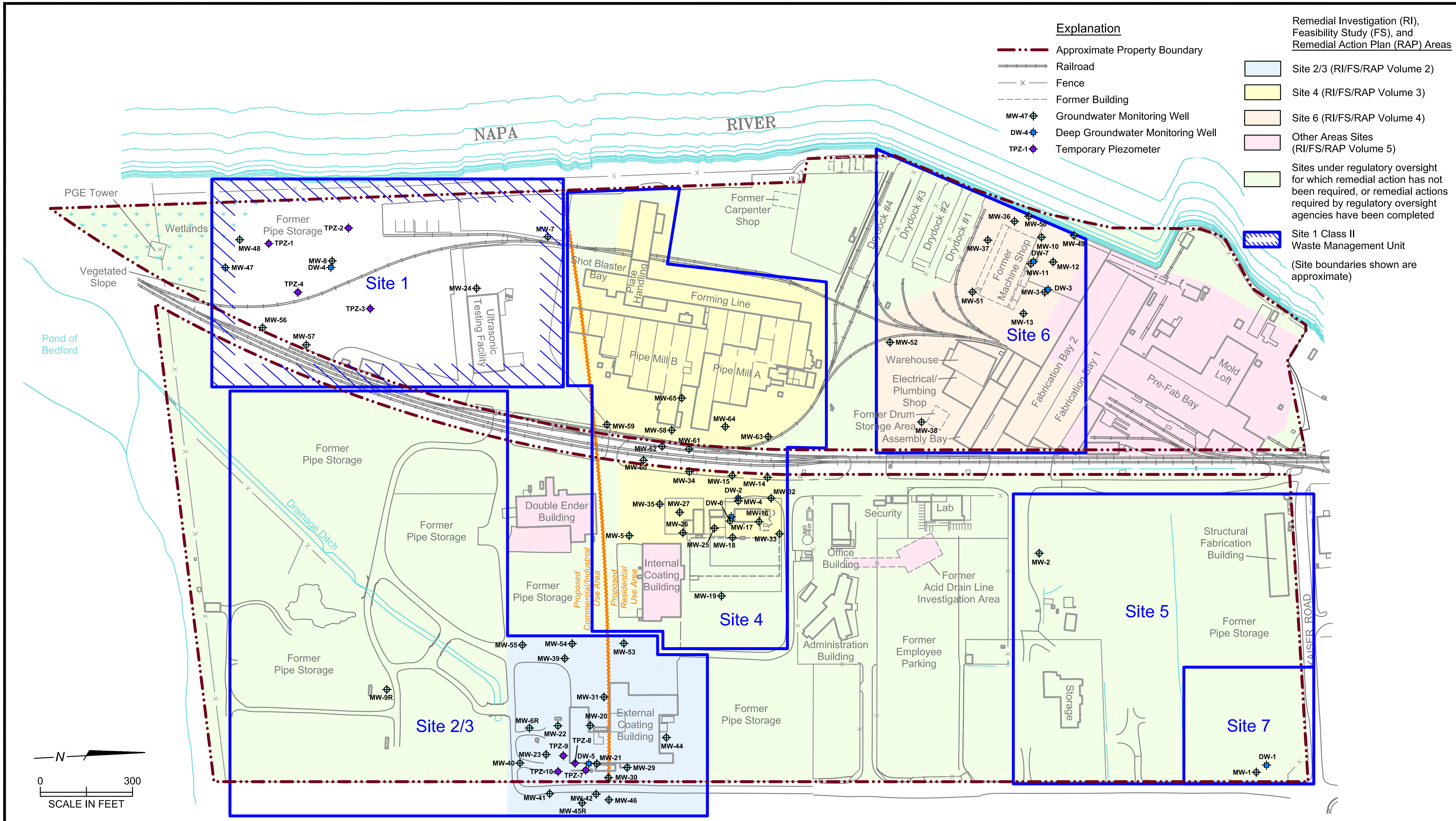
Site Location Map
Napa Pipe Facility
1025 Kaiser Road
Napa, California

PLATE
1

1068.001.07.004	1068_RI_Vol1_pl 1	DRAFT	6/07
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE



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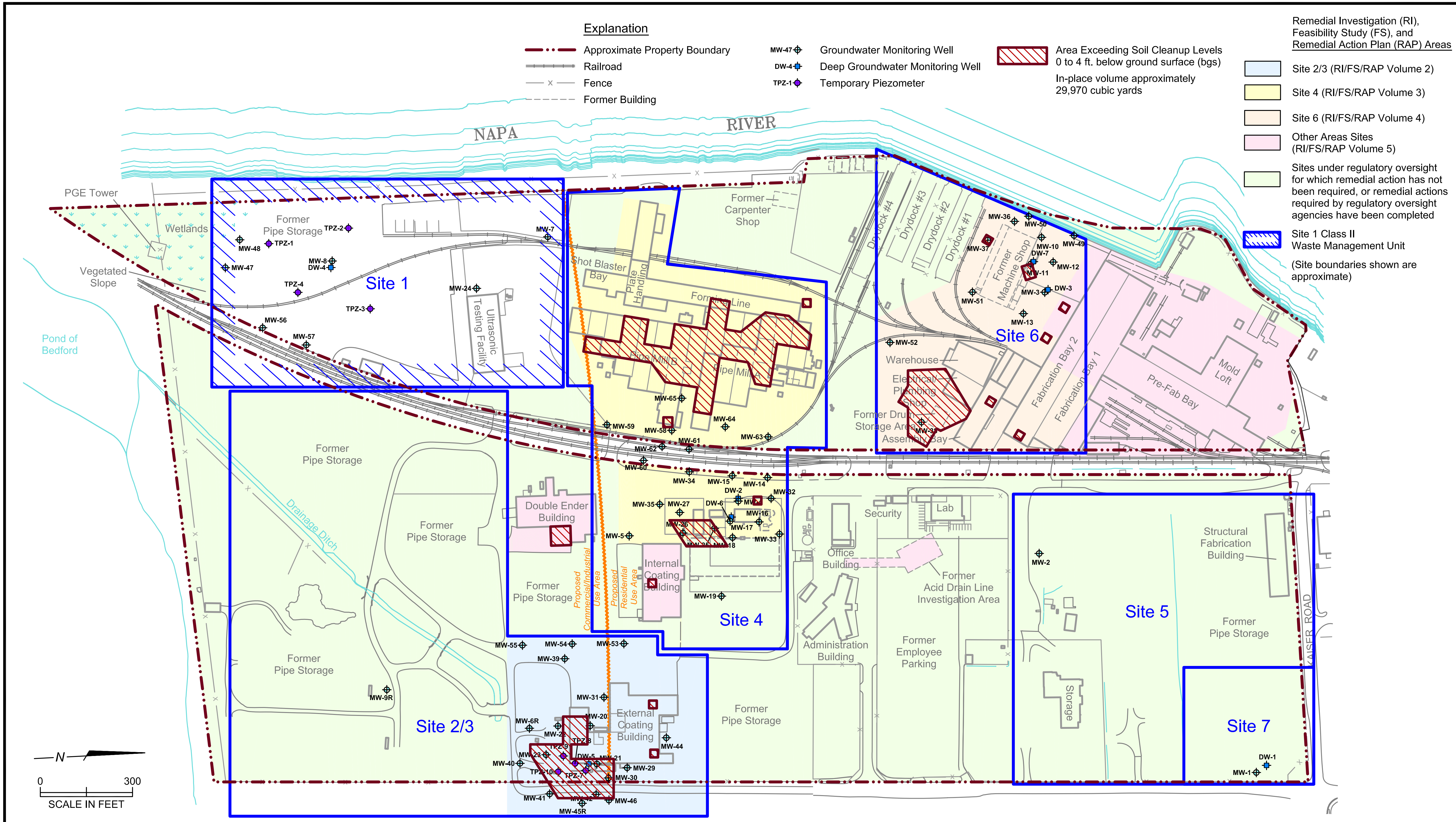
Site Delineation Map
Napa Pipe Facility
1025 Kaiser Road
Napa, California

PLATE
2

1068.001.11.004	1068_RI_Vol1_site	DRAFT	6/07
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE



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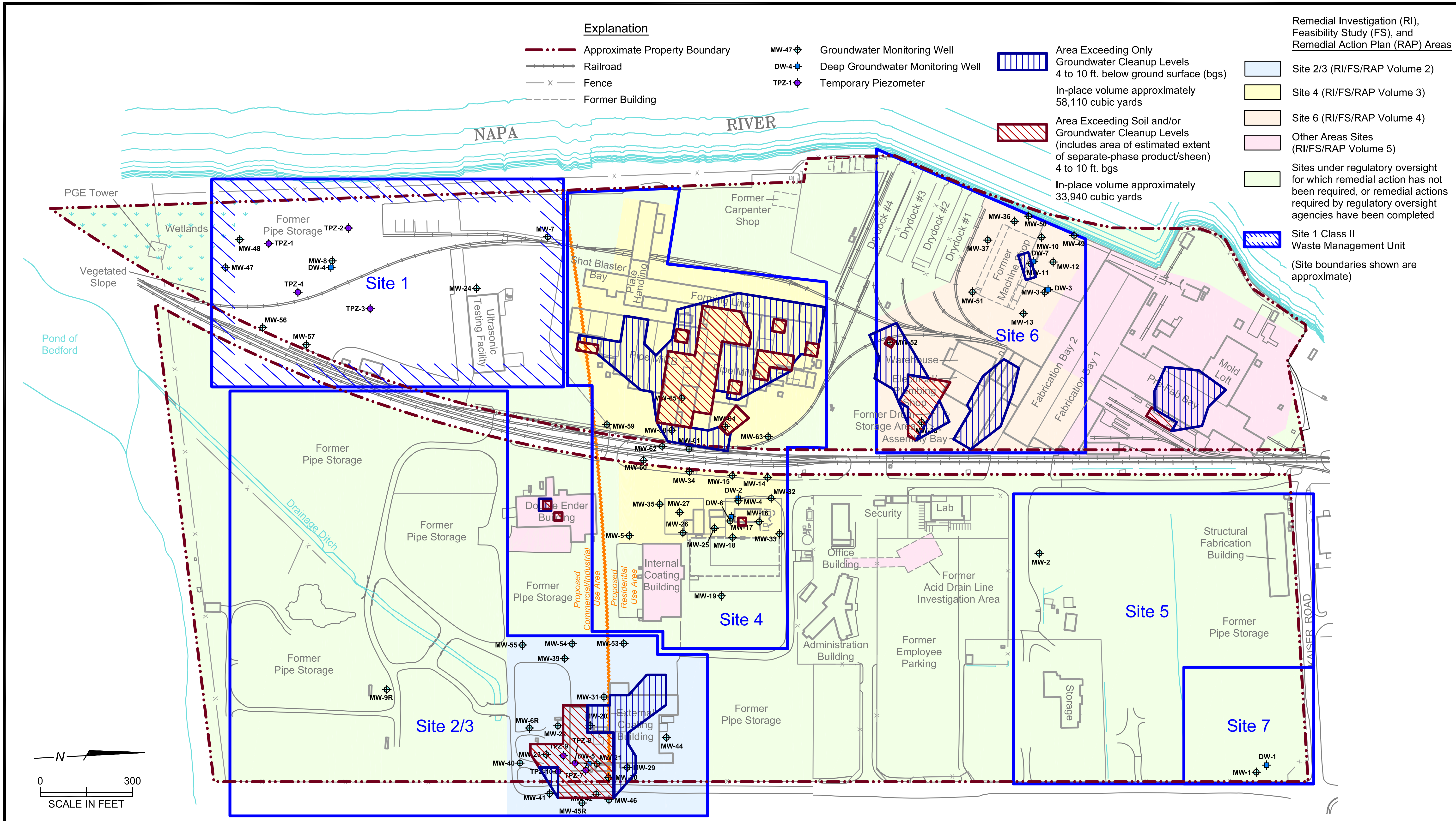
Approximate Area of Unsaturated Soil (0 to 4 ft. bgs) Exceeding Cleanup Levels
Napa Pipe Facility
1025 Kaiser Road
Napa, California

PLATE
3

JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE
1068.001.11.004	1068_RI_Vol1_xcav	DRAFT	6/07



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Approximate Area of Saturated Soil (4 to 10 ft. bgs) and Groundwater Exceeding Cleanup Levels
Napa Pipe Facility
1025 Kaiser Road
Napa, California

PLATE
4

JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE
1068.001.11.004	1068_RI_Vol1_xcav	DRAFT	6/07