Purity Oil Sales Superfund Site

PROPOSED PLAN

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 9 SAN FRANCISCO, CA APRIL 2005

Introduction

The United States Environmental Protection Agency (EPA) Region 9 is seeking public comments on this *Proposed Plan** to address proposed changes to the cleanup method (the remedy) for soil *contamination* at the Purity Oil Sales *Superfund* (Purity Oil) site in Fresno, California. The remedy to address contaminated soil at the site is presented in the *Record of Decision* (ROD), which was signed by the EPA in 1992. The selected remedy was containment of contaminated soils on site using a *RCRA cap*. During construction of the remedy, acidic *sludge* began to seep to the surface at several on-site locations. EPA became concerned that the acidic sludge (with a pH of less than 1) could come in contact with the synthetic liner, which is a component of the cap, and damage the liner which would reduce the overall protection of human health and the environment; therefore, EPA began assessing alternatives to prevent the acidic sludge from potentially damaging the cap liner. In addition, site-related sludge and contaminated soil has been found on neighboring properties. This proposed plan identifies EPA's preferred changes to the remedy and summarizes alternatives considered by EPA to address both on- and off-site contamination.

EPA's primary objective is to protect public health and the environment from environmental contaminants detected at the Purity Oil site. The Proposed Plan summarizes information that can be found in the *remedial investigation* (RI) and *feasibility study* (FS) reports, *remedial design, remedial action work plan*, and technical memorandum for the beyond-the-property-line investigation, and other documents in the *Administrative Record File* for the site. The Administrative Record File is available for public review at the Information Repositories listed on page 17.

EPA, as the lead agency for the site, is required to (1) issue this Proposed Plan to fulfill the requirements of Section 117(a) of the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)* of 1980 and the *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*, and (2) facilitate community involvement in selection of remedies for the site. EPA has prepared the Proposed Plan to (1) inform the community about the history and environmental findings at the site, (2) describe the cleanup alternatives and EPA's preferred alternatives for on- and off-site contamination, (3) solicit public comments on EPA's preferred alternatives, and (4) describe how the public can become involved.

Continued on page 2

Public Comment Period

EPA will accept written comments on the Proposed Plan during the public comment period of April 1, 2005, through May 2, 2005

Submit comments to:
Ms. Rose Marie Caraway
EPA Region 9
75 Hawthorne St. (SFD 7-2)
San Francisco, CA 94105-3901

Public Meeting

You are invited to a meeting sponsored by EPA to hear about the Proposed Plan for cleaning up the Purity Oil Sales Superfund site. At the meeting, you will be able to state your views about the cleanup.

Meeting will be held:
April 13, 2005
7:00 p.m.
Robert J. Arriaga Community Center
3582 South Winery Avenue
Fresno, CA

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Note: All words in **bold italics are defined in the Glossary of Terms on pages 15 and 16.*

EPA will select the final cleanup method for the Purity Oil site after considering the community's input. EPA encourages you to read the Proposed Plan and other related environmental studies associated with the site. Public input on all alternatives and on the information that supports the alternatives is an important part of the remedy selection process. On April 13, 2005, a public meeting will be held to present information on the site and describe the alternatives included in this Proposed Plan. Your input can influence EPA's final decision.

EPA is the lead agency for the site and has worked with the California Department of Toxic Substances Control (DTSC) on site-related environmental issues. After considering public comments, EPA, in consultation with DTSC, will make a final selection of the remedies to be implemented at the site. EPA will then present the remedies and implementation plans in a *ROD Amendment (ROD)*. The ROD Amendment will include a *Responsiveness Summary*, which will present all public comments received on the Proposed Plan along with EPA's responses to public comments.

Site Background

The Purity Oil site is a former used oil recycling facility located in the township of Malaga at 3281 South Maple Avenue in Fresno County, California. The site covers approximately 7 acres in an area zoned for heavy industrial use. The site is surrounded by a moving van storage facility and a sandblasting facility to the east, a metal recycling facility and a former residential trailer park to the north, a convenience market to the northeast, a composting facility to the west, and an automotive wrecking facility to the south (Figure 1). Several owners recycled waste oil at the Purity oil site between 1934 and 1975. The waste oil was generated by businesses such as service stations, car dealers, truck stops, electrical transformer yards, municipalities, school districts, and military installations. The oil and by-products from the refining process were collected and stored in sumps and storage tanks and disposed of on site in about seven large waste pits.

In 1973, Purity Oil was ordered by a Superior Court to empty and backfill the waste pits. Owners of the site were issued a cleanup and abatement order in 1975 under the enforcement authority of the California Regional Water Quality Control Board. The waste pits were completely filled with construction debris. No evidence is available to indicate whether petroleum wastes stored in the pits were ever emptied. A fire at the site in 1976 destroyed the main warehouse building and adjacent equipment. The remaining equipment was removed from the site, and the area was partially regraded. Seven large steel tanks were all that remained of the processing equipment until EPA removed the tanks in October 1990. The Purity Oil site has been a *National Priorities List* site since 1982.

Environmental investigations and cleanup of contamination at the Purity Oil site follow the federal Superfund process as shown in Figure 2. EPA issued an RI report to characterize contaminants in 1988 and a FS report to evaluate remedial options for the site in 1989. In late 1989, EPA signed a ROD for the extraction and treatment of contaminated groundwater and removal of storage tanks at the site. In 1990, the tanks were removed from the site and an alternate water supply was provided to local residents. The groundwater treatment system has been operating since November 1992. EPA signed a ROD for containment of contaminated soils on the site in 1992. The soil ROD required the following: (1) construction of a RCRA cap, (2) installation of a *soil vapor extraction (SVE) system*, (3) construction of a *slurry wall* around the site perimeter to a depth of 25 feet below ground surface (bgs) with a *retaining wall* for slope stabilization, (4) installa-

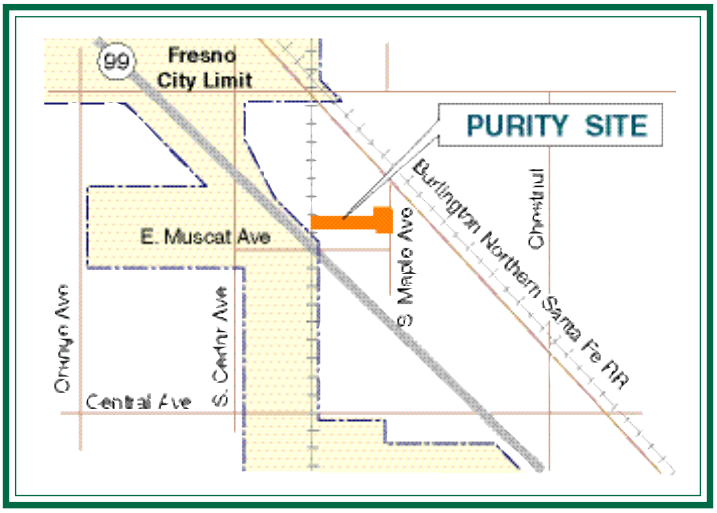

Figure 1.
Site Location Map

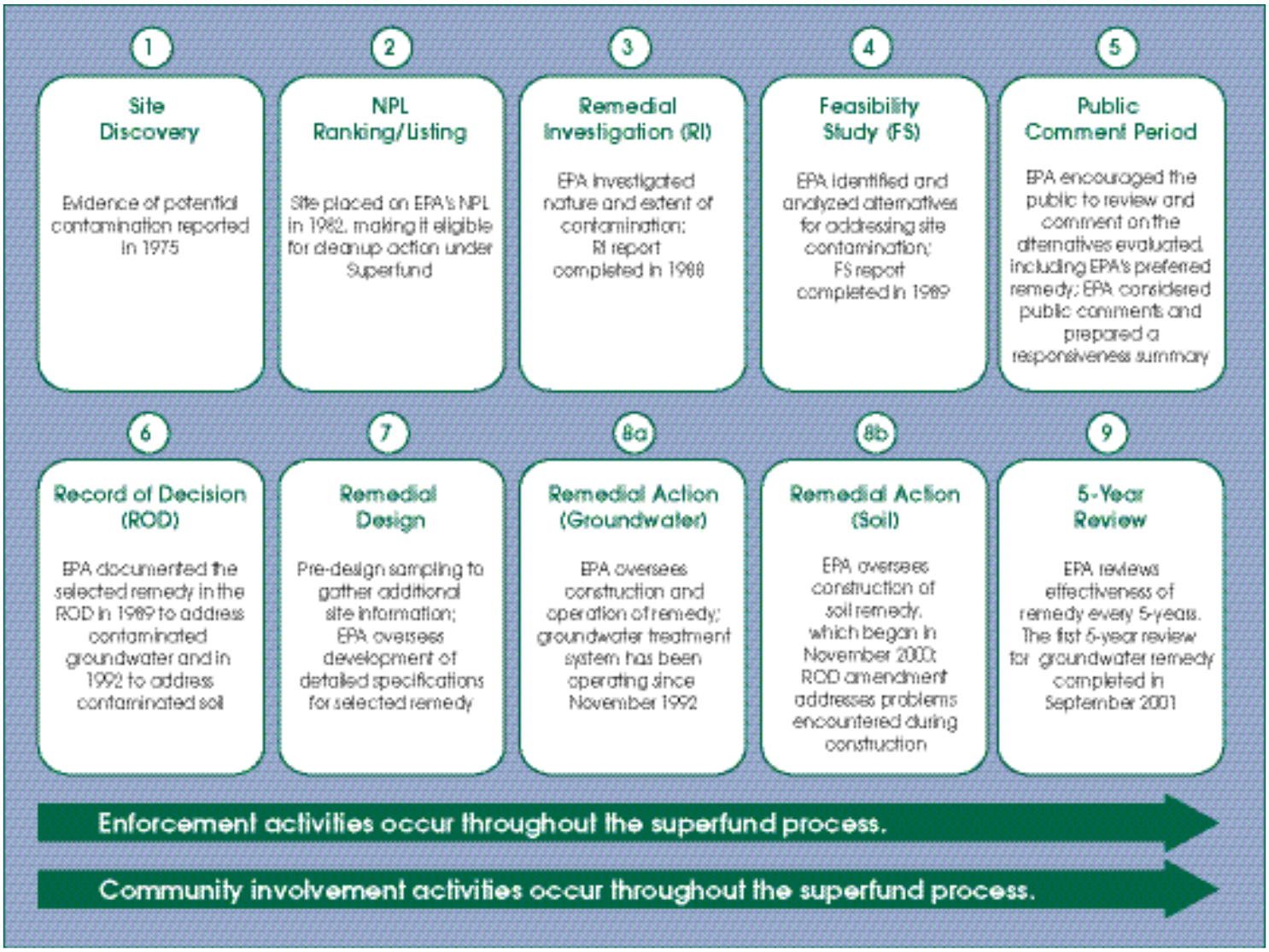

Figure 2.
The Superfund Process for the Purity Oil Sales Superfund Site

tion of a liner in a portion of the North Central Canal located adjacent to the site, and (5) maintenance of a *vadose zone* and *groundwater monitoring program*.

An Explanation of Significant Differences (ESD) for the soil operable unit was signed July 3, 1996. This ESD revised the original ROD based on pre-design data, which was collected at the site in 1994 and 1995.

The ESD revised the five elements in the original 1992 ROD summarized below.

1. The Responsiveness Summary prepared for the 1992 ROD stated that site-related contamination found on neighboring properties would also be remediated consistent with the selected remedy.

2. The original ROD stated that the gas collection system would be constructed, but pre-design studies indicated that gas generation would not exceed allowable emissions. The ESD stated that emissions would be monitored and a treatment system for gas emission built at a later date, if necessary.

3. The required number of SVE wells was reduced because actual pre-design field measurements demonstrated that the soil is far more permeable than estimates used in the original ROD. All components of

tion of the RCRA cap; however, EPA allowed for the contingent operation of the SVE system based on evaluations of the impermeable cap after installation.

4. The slurry wall requirements were eliminated because perched groundwater was not found during pre-design moisture sampling of the vadose zone.

5. The retaining wall that would surround the RCRA cap was eliminated by re-engineering slopes along the perimeter of the cover.

A Consent Decree for the soils operable unit at the site was lodged in December 1997 and entered into in January 1999. As required by the Consent Decree, ChevronTexaco, the settling work defendant for the Purity Oil site, submitted a remedial action work plan in August 1998. EPA disapproved the document in October 1998 because of issues associated with implementation of the remedy and protection of community health during implementation.

In October 1998, EPA determined that it was necessary to permanently relocate trailers along the site fenceline because these trailers were an impediment to the construction of the Superfund remedy. EPA also determined that during implementation of the remedy, it would be extremely difficult to protect the health of residents, especially children living in the trailer park. An ESD was signed on March 7, 2001 for (1) permanent relocation of trailers located along the fenceline and (2) temporary relocation of trailer park residents during remedy construction.

In November 2000, construction of the soil remedy began; however, during construction, acid sludge was observed seeping to the surface at several locations along the perimeter of the former waste pit areas. Concern that the acid sludge could damage the RCRA cap and its ability to protect human health and the environment resulted in further evaluation and selection of remedies.

Between December 2000 and October 2002, EPA conducted investigations to assess whether contamination from the Purity Oil site had impacted neighboring properties. Based on evidence and chemical data collected during these investigations, contamination from the Purity Oil site has impacted the following neighboring properties: Bruno's Iron and Metal, Tall Trees Mobile Home Park, Golden State Market (GSM), and Pick-A-Part Auto Wrecking. Contaminants in soil at these four properties include *volatile organic compounds (VOC)*, *semivolatile organic compounds (SVOC)*, pesticides, petroleum hydrocarbons and *metals*. Under the current remedy, any contamination that has migrated off-site to adjacent properties must be cleaned up in a manner consistent with the selected remedy. In addition, sludge and contaminated soil were found beneath the buildings on GSM property; therefore, EPA considered four alternatives that could remove the contamination and reduce the risk of potential exposure to contaminants found on GSM property.

In April and July 2002, bench-scale tests were performed to evaluate the most effective solidification and *neutralization* reagents for treating the acidic materials. The three reagents tested for the bench scale tests were Quicklime®, Portland cement, and calcium carbonate. Results of the bench scale testing indicate that Quicklime® is the best of the three reagents with respect to strength and neutralization capacity; however, calcium carbonate and Portland cement could be used for solidification if the sludge is mixed with three parts soil by weight during treatment. The benchscale testing also answered the two questions:

- How much water can be added to the soils and sludge during neutralization before the material becomes too soft for effective compaction?

- How much time is required for the neutralization reaction to proceed using a 16 to 200 mesh calcium carbonate material when operating in the ideal moisture range?

Results of the bench-scale tests show that the ideal moisture range is 8 to 10 percent and that a pH of greater than 5 can be achieved after approximately 1 hour of reaction time.

Between April and June 2003, a neutralization pilot study was conducted to field-test the bench-scale test results, and to evaluate the following: (1) procedures for excavating the sludge and contaminated soils and segregating debris within

the excavated materials; (2) equipment and procedures for mixing the calcium carbonate with the acidic materials; (3) procedures for material handling, backfilling, compacting, and compaction testing; and (4) procedures for air quality monitoring and sampling.

Site Description

The site description, contamination and remedies, and remedial action objectives are summarized below.

Presently, the only aboveground structures remaining at the former Purity Oil site are the groundwater treatment plant, a control room trailer constructed in 1992, and trailers used as temporary offices for the construction of the soil remedy. The site grade was raised approximated 3 to 5 feet from the original elevation during backfilling of former pits with construction rubble and fill during the early 1970s. During the construction of the soil remedy in 2002, the site grade was raised an additional 3 to 5 feet when the south-western property boundary along the North Central Canal was moved back 20 to 30 feet. Currently, the site topography consists of a plateau in the area of the former waste pits that is elevated about 6 to 10 feet above the neighboring properties. The perimeter of this plateau is referred to as the "perimeter of waste pits." The 7-acre site is enclosed with a 6-foot-high, chain-linked fence with two locked gates that open to South Maple Avenue. The areas inside and outside the fenced enclosure are referred to as "on-site" and "off-site" areas, respectively. The neighboring off-site properties include GSM, Tall Trees Mobile Home Park, Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, and Burlington Northern Santa Fe Railroad right-of-way (Figure 3).

Contamination and Remedies

Soil at the site is contaminated with VOCs, *polynuclear aromatic hydrocarbons* (PAH), and high levels of lead. The buried waste both on- and off-site has a highly acidic pH as low as 1 and is contaminated with benzene, toluene, PAHs, methylene chloride, phthalates, acetone, other solvents, lead, and other metals. These contaminants have been detected at concentrations exceeding human health-based standards. For example, lead has been detected at concentrations as high as 5,780 milligrams per kilogram (mg/kg) at a depth of 1.5 feet bgs, which is about 14 times higher than EPA's acceptable risk-based level of (400 mg/kg).

Groundwater at the site is contaminated with VOCs, SVOCs, iron, and manganese. The groundwater remedy uses a groundwater extraction system that pumps and treats the groundwater to remove contaminants and to contain the groundwater plume. The groundwater pump-and-treat system has been in operation since 1992.

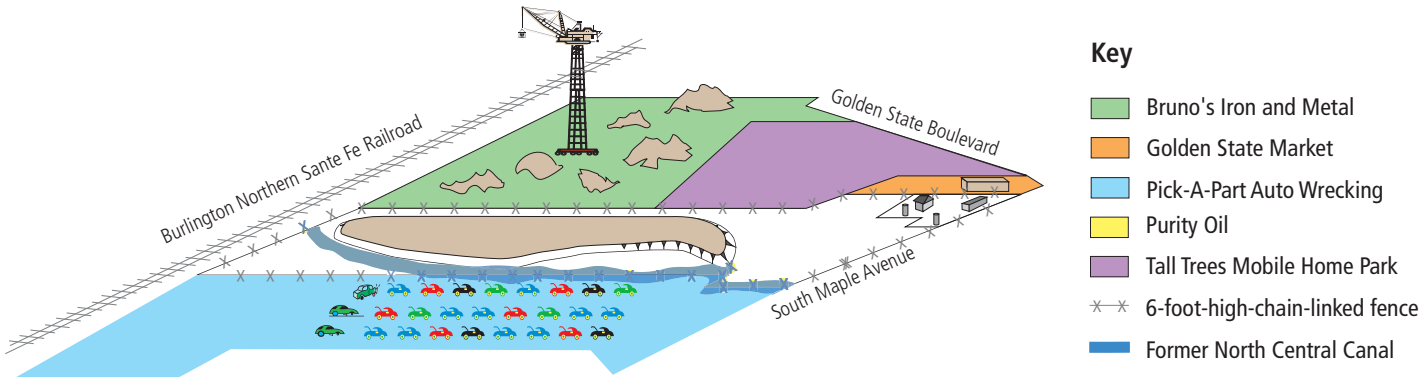

Figure 3.
Site Layout Map

The purpose of the Proposed Plan is to present EPA's preferred alternatives regarding the soil remedy. This revised remedy addresses (1) acid sludge and liquids observed in test pits and observed seeping to the surface on-site during construction activities and (2) site-related sludge and contaminated soil found on neighboring properties. EPA will prepare a ROD Amendment after considering comments on this Proposed Plan.

Remedial Action Objectives

The remedial action objectives for on- and off-site are summarized below.

On-Site Objectives

1. Prevent contact of acidic sludge and acid liquids with the cap liner to increase the remedy's overall protection of human health and the environment.
2. Prevent human exposure (through direct contact) to contaminated soils containing chemicals of concern (COC) at concentrations exceeding applicable or relevant and appropriate requirements (ARAR) and to be considered (TBC) criteria for soil.
3. Prevent or minimize further migration of contaminants from source material to groundwater.
4. Prevent migration of contaminated groundwater to local domestic or irrigation wells.

Off-Site Objectives

1. Prevent acidic sludge and other site-related contaminants from coming in contact with industrial workers on properties adjacent to the site (Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, and Tall Trees Mobile Home Park) and residents on the GSM property.
2. Remove acidic sludge and contaminated soil containing COCs at concentrations exceeding health-based action levels at properties adjacent to the site.
3. Prevent or minimize further migration of contaminants from source material to groundwater.
4. Prevent migration of contaminated groundwater to local domestic or irrigation wells.
5. Remediate COCs in soil and groundwater to drinking water standards and other health-based action levels to reduce risks from potential exposure to indoor air contaminants whose source is site-related contamination.
6. Prevent further migration of soil vapor containing COCs at concentrations exceeding ARARs and TBC criteria.

On-Site Remedy Evaluation

To address the acidic sludge seeps encountered during construction of the soil remedy and sludge and acidic liquids observed in test pits, EPA considered eight alternatives for reducing risk from potential exposure to the acidic sludge and contaminated soil. Each alternative evaluated by EPA is summarized below and illustrated on Figure 4. CERCLA requires that remedial action alternatives be evaluated in terms of how well the alternatives meet the nine specific remedy selection criteria outlined in Figure 5.

Sludge Remedy Alternative 1 – No Action: EPA is required to consider a No Action alternative for comparison with other remedial alternatives. The No Action alternative provides a baseline for evaluation in terms of risk to the public if no action is taken. In this Proposed Plan, the No Action alternative evaluates what would occur at the site should EPA implement the previously selected remedy without modification.

If no action is taken at the site, acidic sludge could migrate to the surface and damage the cap liner. It would provide the least overall protection of human health and the environment. The No Action alternative does **not** meet EPA's remedial action objectives and does not comply with state or federal requirements.

Sludge Remedy Alternative 2 – Solidify Upper 2 Feet on Perimeter Slope of Waste Pits: This alternative would involve excavating the upper 2 feet of soil (approximately 6,000 cubic yards) along the entire perimeter of the former waste pits, *solidifying* the excavated soil with Portland cement (approximately 800 tons of cement [10 percent by

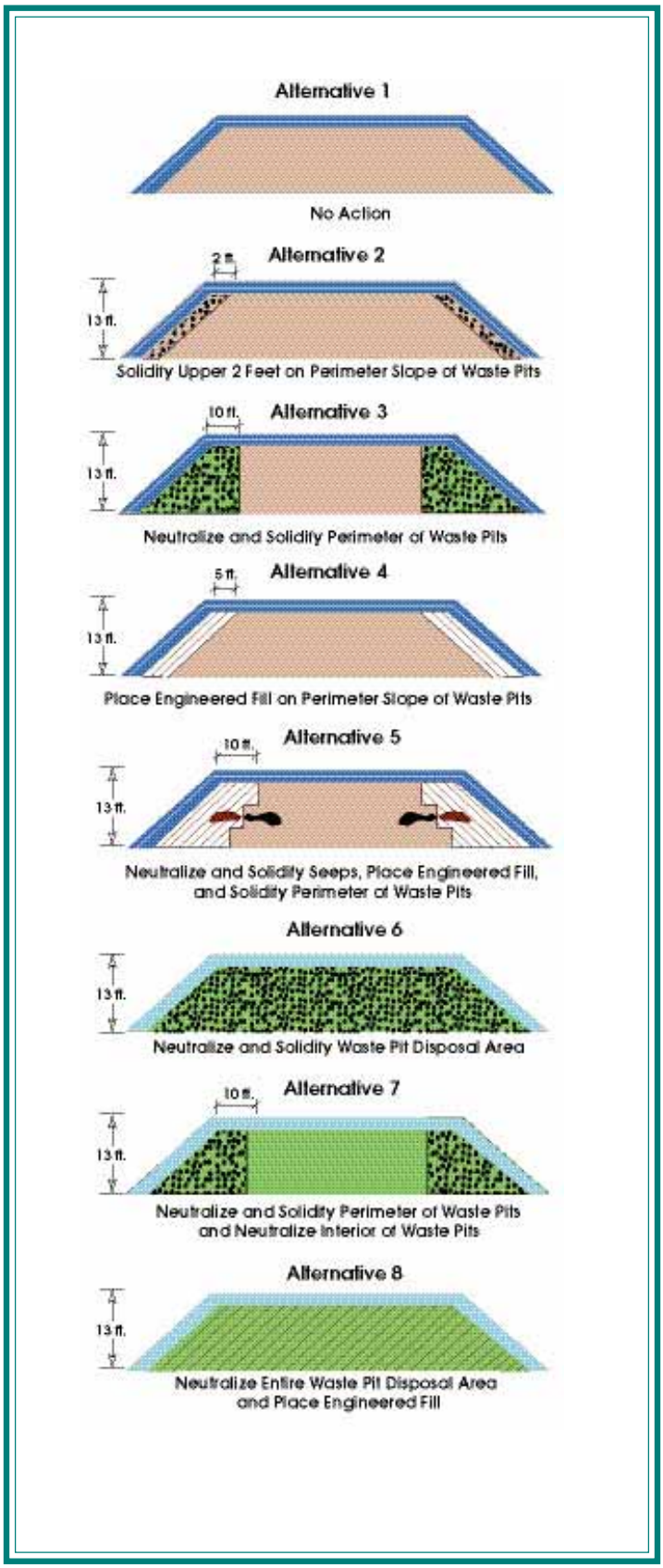

Figure 4. On-Site Remedy Alternatives

weight]), placing the material back in the excavation, and compacting the treated soil. The Portland cement would act as a binding reagent that would increase the compressive strength of the treated material, decrease its permeability, and increase its pH.

The solidified soil would create a 2-foot-wide buffer zone between the untreated soil along the waste pit perimeter and the RCRA cap, which would be constructed over the treated and untreated sludge and soil to prevent direct human contact with waste material, minimize leaching of waste contaminants to groundwater, and satisfy the regulatory requirements for construction of a closure cover system. The RCRA cap would consist of a 2-foot-thick foundation layer: a geosynthetic clay liner (GCL); a 60-mil (1.5 millimeter)-thick high-density polyethylene (HDPE) liner; and a 1-foot-thick vegetative layer designed to promote drainage of surface water. Operation and maintenance (O&M) would be required to ensure the long-term integrity of the cap.

Sludge Remedy Alternative 3 – Neutralize and Solidify Perimeter of Waste Pits: This alternative would involve excavating soil along the outer wedge of the perimeter of the former waste pits to 10 feet inside the crest of the waste pits and to a depth of 13 feet bgs, and neutralizing and solidifying the excavated soil with calcium carbonate and Portland cement, respectively, while placing and compacting the treated soil back in the excavation to reconstruct the perimeter of the waste pits.

Bench-scale testing was conducted to determine the optimum mix ratios of soil, sludge, and calcium carbonate needed to neutralize the materials to a pH above 5 while minimizing the potential for sulfur dioxide gas to form during the treatment process. The Portland cement would

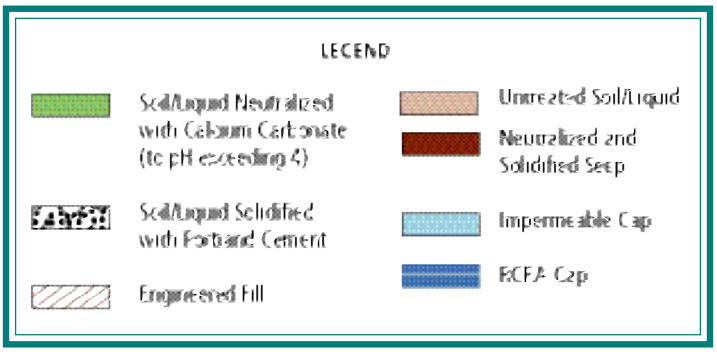

Figure 5.
Remedy Selection: Nine Criteria for Evaluating Remedial Alternatives

increase the material's pH, act as a binding agent to increase the compressive strength of the treated materials, decrease its permeability, and create a buffer zone between the remaining untreated soils and the RCRA cap. This alternative would involve excavating approximately 25,000 cubic yards of contaminated soils; neutralizing the excavated soil with approximately 6,000 tons of calcium carbonate (15 percent by weight); and solidifying the excavated soil with approximately 4,000 tons of Portland cement (10 percent by weight). A RCRA cap would be constructed over the treated and untreated sludge and soil (see Alternative 2 for a description of the RCRA cap).

Sludge Remedy Alternative 4 – Place Engineered Fill on Perimeter Slope of Waste Pits: This alternative would involve excavating soil along the outer slope of the former waste pits to 5 feet inside the crest of the waste pits and to a depth of 13 feet bgs, and placing and compacting engineered fill back in the excavations to rebuild the perimeter slope of the former waste pit disposal area. This alternative would involve excavating approximatately 12,000 cubic yards of sludge and contaminated soil on the outer slope of the former waste pits and backfilling the excavation with engineered fill from an off-site source. The engineered fill would have to meet the design subgrade fill construction specifications (such that debris cannot exceed 3 inches in diameter within the fill; fill material would be placed in 6-inch-thick lifts and compacted to 90 percent of the maximum dry density in accordance with American Society for Testing and Materials (ASTM) ASTM D 1557. Fill material would be compacted to within 3 percent of the optimum water content. A RCRA cap would be constructed over the treated and untreated soils (see Alternative 2 for a description of the RCRA cap).

Sludge Remedy Alternative 5 – Neutralize and Solidify Seeps, Place Engineered Fill and Solidify Perimeter of Waste Pits: This alternative would involve neutralizing and solidifying the seeps with calcium carbonate (15 percent by weight) and solidifying the fill with Portland cement (10 percent by weight). It would also include excavating and reconstructing the outer wedge of the former waste pits perimeter to 10

feet inside the crest of the waste pits with engineered and solidified fill that is benched into the untreated soil to a depth of 13 feet bgs. This alternative would involve importing approximately 25,000 cubic yards of engineered fill from an off-site source; solidifying the imported fill with Portland cement (10 percent by weight); placing the solidified soil in the excavation; and compacting in lifts. The engineered and solidified fill would have to meet the subgrade fill construction specifications (see Alternative 4 for subgrade fill construction specifications). A RCRA cap would be constructed over the treated and untreated sludge and soil (see Alternative 2 for a description of the RCRA cap).

Sludge Remedy Alternative 6 – Neutralize and Solidify Entire Waste Pit Disposal Area: This alternative would involve excavating the entire waste pit disposal area to a depth of 13 feet bgs, neutralizing the excavated material with calcium carbonate, solidifying the material with Portland cement, and placing and compacting the treated material back into the excavation. This alternative would involve excavating approximately 80,000 cubic yards of sludge and contaminated soils, neutralizing the excavated materials with approximately 17,000 tons of calcium carbonate (15 percent by weight); solidifying the excavated materials with approximately 17,000 tons of Portland cement (10 percent by weight); and placing and compacting the treated material in lifts. A low-permeability cap would be constructed over the treated soil to prevent direct human contact with waste material, minimize leaching of waste contaminants to groundwater, and satisfy the regulatory requirements for construction of a closure cover system. The low-permeability cap would consist of six inches of sand between the neutralized/solidified material and a GCL or 60-mil-thick textured HDPE liner, a drainage layer (geosynthetic or gravel), and a 2-foot vegetative layer. O&M would be required to ensure the long term integrity of the low-permeability cap.

Sludge Remedy Alternative 7 – Neutralize and Solidify Perimeter of Waste Pits and Neutralize Interior of Waste Pits: This alternative would involve neutralizing with calcium carbonate and solidifying with Portland cement the perimeter of the former waste pits to 10 feet bgs inside the crest of the waste pits and to a depth of 13 feet bgs, and neutralizing with calcium carbonate the interior of the waste pits to a depth of 13 feet bgs. This alternative would involve excavating approximately 80,000 cubic yards of sludge and contaminated soils and neutralizing the excavated materials with approximately 17,000 tons of calcium carbonate (15 percent by weight). After neutralization, approximately 25,000 cubic yards of the neutralized soils would be solidified with 4,000 tons of Portland cement (10 percent by weight). The neutralized and solidified material would be used to reconstruct the perimeter slope of the former waste pit area in accordance with the designed requirements for subgrade fill construction (see Alternative 4 for the subgrade fill construction specifications). A low-permeability cap would be constructed over the treated soil (see Alternative 6 for a description of the low-permeability cap).

Sludge Remedy Alternative 8 – Neutralize Entire Waste Pit Disposal Area and Place Engineered Fill: This alternative would involve excavating the entire waste pit disposal area to a depth of 13 feet bgs, neutralizing the excavated material with calcium carbonate, and placing and compacting treated soil back in the excavation. This alternative would involve excavating approximately 80,000 cubic yards of sludge and contaminated soils; neutralizing the excavated materials with approximately 17,000 tons of calcium carbonate (15 percent by weight); and placing and compacting the treated material in lifts. A low-permeability cap would be constructed over the treated soil (see Alternative 6 for a description of the low-permeability cap).

The assembled remedial alternatives were evaluated in detail against the nine evaluation criteria developed by EPA (Figure 5). The results are summarized in Figure 6. Of the eight alternatives evaluated, EPA's preferred on-site remedy to address the acidic sludge is Alternative 8, which consists of neutralizing the entire waste pit disposal area and covering the neutralized waste pits with a low-permeability cap (see explanation of pilot study on page 4). Alternative 8 fully meets each criterion except for the "Reduction of Toxicity, Mobility, or Volume" criterion. Alternative 8 partially meets this criterion. The toxicity of the metals in the waste would remain unchanged; however, the low-permeability cap would encapsulate the metal- contaminated waste, reduce surface water from infiltrating through the waste and potentially mobilizing the contaminants, and prevent human contact with the waste, thereby reducing

CERCLA Remedy Selection Nine Criteria	ALT. 1 No Action	ALT. 2 Solidify Upper 2 Feet on Perimeter Slope of Waste Pits	ALT. 3 Neutralize and Solidify Perimeter of Waste Pits	ALT. 4 Place Engineered Fill on Perimeter Slope of Waste Pits	ALT. 5 Neutralize and Solidify Seep, Place Engineered Fill and Solidify Perimeter of Waste Pits	ALT. 6 Neutralize and Solidify Waste Pits Disposal Area	ALT. 7 Neutralize and Solidify Perimeter of Waste Pits and Neutralize Interior of Waste Pits	ALT. 8 Neutralize Entire Waste Pit Disposal Area and Place Engineered Fill
Overall Protectiveness	○	○	◒	◒	◒	●	●	●
Compliance with ARARs	○	◒	◒	◒	◒	●	●	●
Long-term Effectiveness	○	○	◒	◒	◒	●	●	●
Reduction of Toxicity Mobility or Volume	○	○	◒	○	◒	●	◒*	◒*
Short-term Effectiveness	N/A	◒	◒	◒	◒	●	●	●
Implementability	N/A	●	●	●	●	●	●	●
Cost	$0	$940,000	$2,700,000	$1,100,000	$4,000,000	$6,800,000	$5,300,000	$4,300,000
State Acceptance	State acceptance of the preferred alternative will be evaluated after the public comment period							
Community Acceptance	Community acceptance of the preferred alternative will be evaluated after the public comment period.							

Notes

ALT Alternative

EPA's preferred alternative

* Metal toxicity of waste remains unchanged, therefore, partially meets criterion

○ Does not meet criterion

◒ Partially meets criterion

● Fully meets criterion

Figure 6.
On-Site Remedy Alternatives Evaluation Summary

potential public health risks. EPA believes that the preferred alternative (1) meets the remedial action objectives; and (2) meets the nine criteria for remedy evaluation. EPA proposes to add neutralization of the entire waste pit disposal area (Alternative 8) to the soil remedy.

The cap design for Alternative 8 would change from the RCRA-equivalent cap specified in the original ROD to a low-permeability cap. EPA continues to recommend a final cover that would meet the RCRA closure performance standards for a final cover. The changes in final cover design result from the changes in the waste materials after neutralization. With the original ROD RCRA-equivalent cap, the design accounted for free acidic liquids and VOCs as well as metals in the waste materials. By neutralizing the waste, the pH of the free liquids would be adjusted and the VOCs would be eliminated or substantially reduced.

Off-Site Remedy Evaluation

To address the sludge and contaminated soil at the neighboring properties (Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, Tall Trees Mobile Home Park, and GSM), EPA is recommending excavating contaminated soil and backfilling the excavations with clean soil as summarized below:

- Excavate all acidic sludge found on neighboring properties.
- Excavate contaminated soil found on neighboring properties that originated from the historic operation of Purity Oil. To protect against direct contact exposure, EPA would set the vertical limits of excavation for direct contact at 4 feet bgs for industrial sites (Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, and Tall Trees Mobile Home Park) and 7 feet bgs at the residential site (GSM).
- Excavate contaminated soil where levels of contaminants of concern (COCs) exceed the health-based cleanup levels calculated from EPA Region 9 preliminary remediation goals (PRGs) for industrial use, and where total petroleum hydrocarbon (TPH) levels exceed 10,000 mg/kg at the Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, and Tall Trees Mobile Home Park properties. The contaminated materials would be excavated until the soil cleanup level is met or the maximum depth of 4 feet is reached.
- Excavate contaminated soil where levels of COCs exceed the health-based cleanup levels calculated from EPA Region 9 PRGs for residential use, and TPH levels exceed 2,300 mg/kg at GSM property. The contaminated materials would be excavated until the soil cleanup level is met or the maximum depth of 7 feet is reached.
- Backfill all excavations with clean soil placed in 1-foot-thick lifts and compacted.
- Haul the excavated soil to the Purity Oil site, neutralize the soil (if necessary), and place it under the low-permeability cap, and

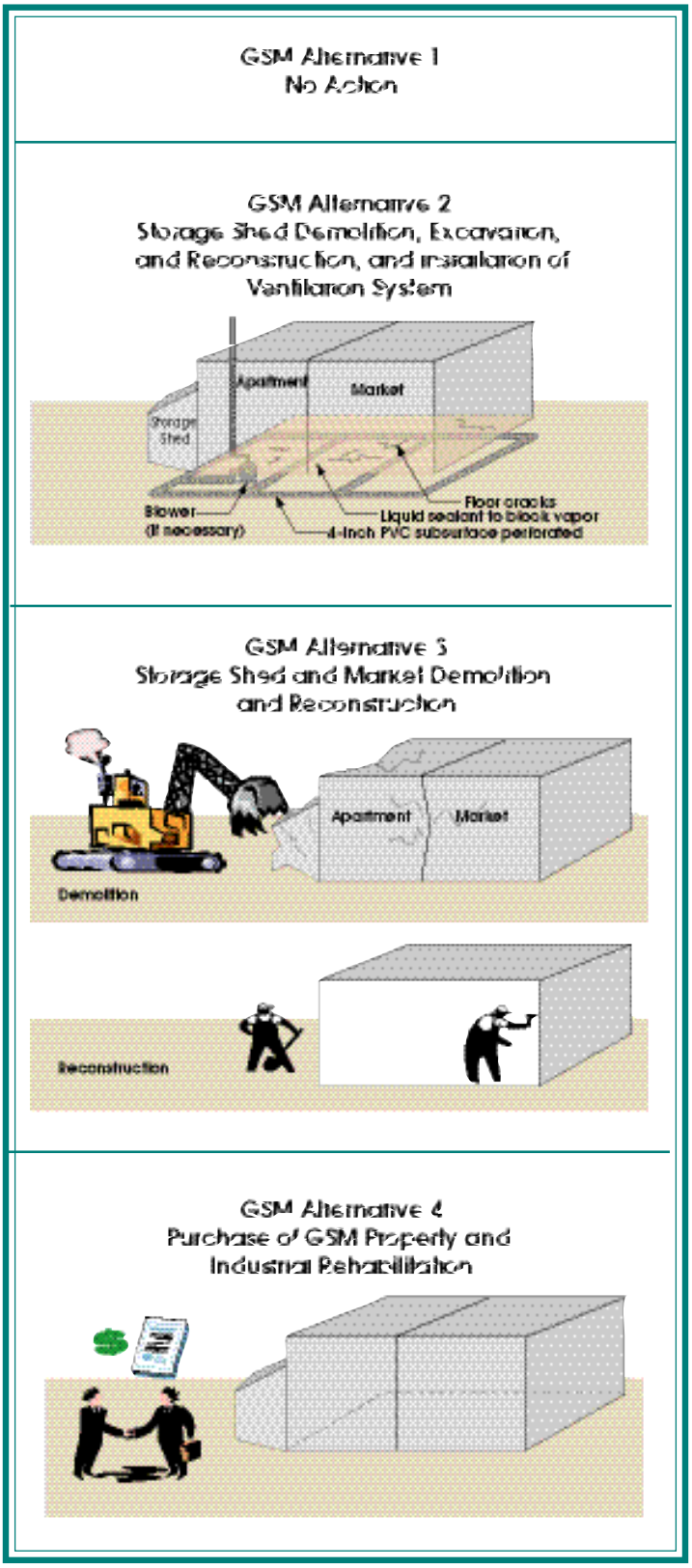

Figure 7.
Off-Site Remedy Alternatives

- On GSM property, sludge and contaminated soil were also found beneath the building structures. To address the contamination that extends beneath GSM buildings, EPA evaluated four alternatives, which are summarized below.

Golden State Market Alternatives Evaluation

On the GSM property, sludge and contaminated soil were found beneath the storage shed located behind the market and may extend beneath the market as well. To address the sludge and contaminated soil found beneath these buildings, EPA considered four alternatives to reduce risk from potential exposure to the acidic sludge and contaminated soil. Each alternative is illustrated on Figure 7 and summarized below.

GSM Alternative 1 -No Action: EPA is required to consider a No Action alternative for comparison with other remedial alternatives. The No Action alternative provides a baseline for evaluation in terms of risk to the public if no action is taken. The No Action alternative does not involve any proactive treatment, removal, or monitoring of the contaminated media.

If no action is taken, residual contamination in soil could migrate to the surface in vapor form and/or migrate downward and act as a continual source of groundwater contamination. There is no cost associated with this alternative, and it would provide the least overall protection of human health and the environment. The No Action alternative does not meet EPA's remedial action objectives and does not comply with state or federal requirements because contamination in soil has been found on neighboring properties at concentrations exceeding health based standards (for example: lead at 5,780 mg/kg).

GSM Alternative 2 – Storage Shed Demolition, Excavation, and Reconstruction, and Installation of Ventilation System: This alternative would involve (1) demolition of the rear storage shed, excavation of soil, and reconstruction of the shed, and (2) installation of a ventilation system that would block and re-direct subsurface vapors from entering GSM and the caretaker's apartment. The demolition/excavation/rebuilding phase would involve the following activities:

- Demolition of the entire wood storage shed and its foundation
- Excavation of all acidic sludge found on GSM property
- Excavation of all contaminated soil found on GSM that originated from historic Purity Oil site operations; vertical limits of excavation for direct contact set at 7 feet bgs
- Use of health-based cleanup levels calculated from EPA Region 9 PRGs for residential use and 2,300 mg/kg for TPH as soil cleanup levels
- Backfilling of excavation with clean soil, and construct a new storage shed with a ventilation system as necessary
- Recording of enforceable deed restrictions and deed notifications with the land to provide appropriate notice to future owners that contaminated soil may be present at depths greater than 7 feet bgs; deed restrictions and notifications would not prevent future industrial development; however, notification to and approval by regulatory agencies would be required before work below 7 feet bgs could begin

A ventilation system would be installed to prevent organic vapors from entering the market through cracks and openings in the foundation. To block vapors that could come up through floor cracks, drains, or utility openings, a liquid sealant would be placed over the entire floor of the market. To redirect the subsurface vapors, a perforated drain pipe would be placed around the perimeter of the market and beneath the market's foundation to capture and vent the vapors outside the building to above the roof line of the market. The venting system would be installed in two phases. Phase 1 would consist of (1) sealing the floor of the market and (2) installing the subsurface piping and aboveground vents and testing the system under natural (passive) conditions. Phase 2, if necessary, would consist of installing a low-flow fan that would be attached to the subsurface piping to creat a vacuum beneath the market foundation for active (mechanical) vapor removal

GSM Alternative 3 – Storage Shed and Market Demolition and Reconstruction: This alternative would involve (1) full demolition and reconstruction of the rear storage shed and, (2) depending on the extent of contamination beneath the market, partial to full demolition and reconstruction of the market building. A phased approach would be used to implement this alternative as summarized below.

- Phase 1 – Storage Shed Demolition and Reconstruction: Phase 1 would consist of demolition of the storage shed, excavation of the sludge and contaminated soil, and reconstruction of the storage shed.
- Phase 2 – Caretaker's Apartment Demolition and Reconstruction: If contamination is found to extend beneath the caretaker's apartment, the caretaker's apartment would be demolished, sludge and contaminated soil would be excavated, and the caretaker's apartment would be reconstructed.
- Phase 3 – Market Demolition and Reconstruction: If contamination is found to extend beneath the market, the market would be demolished, excavation of sludge and contaminated soil would be excavated, and the market would be reconstructed.

Excavation and reconstruction activities would consist of (1) removal of all site-related sludge and (2) removal of contaminated soil found on the GSM property to a maximum depth of seven feet bgs unless contaminant concentrations are less than health-based cleanup levels calculated from EPA Region 9 PRGs for residential use and 2,300 mg/kg for TPH. All excavations would be backfilled with clean soil. The buildings would be replaced in kind (of similar materials, size and quality).

GSM Alternative 4 – Purchase of the GSM Property and Industrial Rehabilitation: This alternative would involve purchasing the land and buildings on the GSM property and rehabilitating the parcel for industrial use. Under this approach, the parcel rehabilitation would consist of the following activities:

- Excavation of all acidic sludge found on the GSM property and demolition of all buildings.
- Excavation of all contaminated soil found on the GSM property that originated from historic Purity Oil site operations to prevent direct contact exposure, with the vertical limits of the excavation set at 4 feet bgs.
- Use of health-based cleanup levels calculated from EPA Region 9 PRGs for industrial use and 10,000 mg/kg for TPH for soil cleanup levels.
- Backfilling all excavation with clean soil.
- Recording of enforceable deed restrictions and notifications with the land to provide appropriate notice to future owners that contaminated soil may be present at depths greater than 4 feet bgs; deed restrictions and notifications would not prevent possible future industrial development; however, notification to and approval by regulatory agencies would be required before work below 4 feet bgs could begin.
- The assembled remedial alternatives for the GSM property were evaluated in detail with respect to the nine evaluation criteria (Figure 5) by EPA and the results are summarized in Figure 8.

Based on EPA's evaluation of alternatives for the GSM property, the preferred remedy is a combination of GSM Alternative 3 and GSM Alternative 4. EPA believes that Alternatives 3 and 4 both (1) meet the remedial action objectives for the off-site properties and (2) meet the nine critera for remedy evaluation.

After excavation of sludge and contaminated soil on the off-site properties is complete, additional soil and soil gas sampling will be performed to determine the extent of contamination that is being left in place on the off-site properties between the bottom of the excavation and the top of the water table. This information will be utilized to determine if remaining levels are a threat to groundwater or indoor air by the vapor intrusion pathway and if additional remedial actions are required to protect public health and the environment. EPA is currently evaluating a change to the groundwater remedy for the site. This information will be included in the decision making process for the changes to the groundwater remedy.

CERCLA Remedy Selection Nine Criteria	ALT. 1 No Action	ALT. 2 Storage Shed Demolition and Reconstruction, Seal Floor and Ventilation	ALT. 3 Storage Shed and Market Demolition and Reconstruction	ALT. 4 Purchase Market and Industrial Rehabilitation
Overall Protectiveness	○	◒	●	●
Compliance with State and Federal Requirements	○	◒	●	●
Long-term Effectiveness	○	◒	●	●
Reduction of Toxicity, Mobility, or Volume	○	◒	●	●
Short-term Effectiveness	N/A	◒	●	●
Implementability	N/A	◒	●	●
Cost	$0	$50,000 to $75,000	$390,00 to $1,360,000*	$150,00 to $200,000*
State Acceptance	State Agency acceptance of the preferred alternatives will be evaluated after the public comment period			
Community Acceptance	Community acceptance of the preferred alternatives will be evaluated after the public comment period			

Notes:
ALT. Alternative
* This estimate does not include the purchase price of the property which is subject to negotiation.

○ Does not meet criteria
◒ Partially meets criteria
● Fully meets criteria

Figure 8. Off-Site (Golden State Market) Remedy Alternatives Evaluation Summary

Preferred Soil Remedy Summary

Based on EPA's evaluation of alternatives to clean up contaminated soil and acidic sludge on and off the Purity Oil Site, the preferred remedy includes the five elements summarized below.

1. Neutralization - Neutralize the entire waste pit disposal area from the ground surface to an estimated depth of 13 bgs (Alternative 8).

2. Low-permeability cap - Construct a low-permeability cap to reduce surface water from infiltrating through the waste material and potentially mobilizing contaminants in the vadose zone and releasing them to the groundwater. The cap would also eliminate the risk of human exposure.

3. Excavation of Off-site Contamination – Excavate site-related sludge and contaminated soil found on four neighboring properties (Pick-A-Part Auto Wrecking, Bruno's Iron and Metal, Tall Trees Mobile Home Park, and GSM). The excavated materials would be neutralized (if pH is less than 4), and placed under the low-permeability cap. The excavation would be backfilled with clean soil. In addition, EPA's preferred remedy at GSM is either storage shed and market demolition and reconstruction (GSM Alternative 3) or purchase of the

GSM property and industrial rehabilitation (GSM Alternative 4).

4. Groundwater Monitoring Program – Continue with the quarterly groundwater monitoring program currently in place to assess the effectiveness of both the groundwater and soil remedies.

5. SVE and Vadose Zone Monitoring System – Install SVE wells to remove VOCs from the vadose zone on all affected properties. To monitor the effectiveness of the SVE wells, *vadose zone monitoring wells* would be installed to monitor soil vapor concentrations and vacuum being created by the extraction wells.

6. Institutional Controls - If soil containing concentrations greater than the residential cleanup numbers are left in place on Bruno's Iron and Metal, Tall Trees Mobile Home Park, and Pick-A-Part Auto properties deed restrictions will be placed on those properties that prevent the residential use of the property and ensure that the zoning for those properties remain as industrial properties.

7. Additional soil and soil gas sampling - Additional soil and soil gas sampling will be performed to determine the extent of contaminated soil that is being left in place on the off-site properties between the bottom of the excavation and the top of the water table.

Glossary of Terms

Administrative Record File
A complete body of documents that forms the basis for selecting a CERCLA response action.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
A federal law first passed in 1980 and subsequently amended that created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled waste sites. CERCLA is found at Title 40 of the *United States Code, Section 9601*.

Consent Decree
A judicial decree expressing an agreement under which a defendant will perform certain activities in order to resolve charges brought by the government.

Contamination/contaminants
Certain chemical, biological, or related substances that may have an adverse effect on human health, ecological receptors, water, soil, and/or air.

Engineered Fill
Soil having the correct engineering properties (such as permeability, shear strength, and compressibility) that is placed and compacted to meet structural requirements.

Explanation of Significant Differences (ESD)
A document explaining changes made to the ROD for cleanup action.

Feasibility Study (FS)
An EPA study that determines the best way to clean up environmental contamination.

Gas collection system
A series of perforated pipes installed for ventilation to prevent gases from building up beneath the cap.

Groundwater
The supply of water below the ground surface, usually in aquifers.

Groundwater monitoring program
A program to collect water level measurements and groundwater samples for assessing contaminants in groundwater.

Metals
Any of the class of chemical elements that have a luster and can conduct heat and electricity.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
More commonly called the National Contingency Plan or NCP, this plan is the federal government's blueprint for responding to both oil spills and hazardous substance releases.

Glossary of Terms (continued)

National Priorities List (NPL)
EPA's annually updated list of the most serious uncontrolled or abandoned hazardous waste sites in the United States identified for possible long-term cleanup.

Neutralizing
Changing the pH of a material.

Polynuclear aromatic hydrocarbon(PAH)
Group of semi-volatile organic compounds.

Proposed Plan
A document that summarizes all cleanup alternatives studied as part of the RI/FS process and that identifies the preferred cleanup alternatives for a site.

RCRA cap
A closure cover system that encapsulates contaminated materials on-site to prevent surface water from infiltrating through the contaminated materials and that prevents human exposure to the materials.

Record of Decision (ROD)
A document explaining the cleanup action implemented at a contaminated site. The ROD is based on information and technical analyses generated during the RI/FS and on comments received on the Proposed Plan.

ROD Amendment
A document explaining significant changes to the cleanup action presented in the ROD.

Remedial Action work plan
A document explaining how the remedial design will be implemented.

Remedial Design
A document that presents the design details, including design drawings and specifications, for constructing the remedy to clean up site contamination.

Remedial Investigation (RI)
The CERCLA process of determining the type and extent of hazardous materials contamination at a site.

Responsiveness Summary
A written summary of oral and/or written comments, criticisms, and new relevant information received during a public comment period and the EPA's responses to these comments. A Responsiveness Summary is an appendix to a Record of Decision or ROD amendment.

Retaining wall
A wall installed to stabilize a slope.

Semivolatile organic compounds (SVOCs)
Semivolatile carbon-containing chemicals.

Sludge
A tarry material consisting of by-products from refining waste oil.

Slurry wall
A subsurface impermeable wall that contains groundwater and/or hazardous liquids to prevent migration of hazardous materials.

Soil Vapor Extraction system /SVE wells
A system that extracts contaminated vapors from soil by creating a vacuum in subsurface soils. The system consists of extraction wells installed in the unsaturated zone, a blower to create the vacuum that draws the contamination out of the soil, and a treatment system to remove the contaminated vapor from the air.

Solidify
A process that changes physical or chemical properties of a material through mixing a reagent (such as cement or fly ash) into the material to lock the contamination within the solidified matrix.

Superfund
Superfund is the common name for the process established CERCLA to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Vadose zone
Unsaturated (not completely filled with water) layer of soil or rock between the surface and groundwater table.

Vadose zone monitoring wells
A series of wells installed in the unsaturated (vadose) zone for monitoring soil vapor concentrations and vacuum created by the SVE system.

Volatile organic compound (VOC)
Carbon-containing chemicals that evaporate readily at room temperature.

Information Repositories

Copies of the Purity Oil Sales Superfund site RI and FS reports and other Site-related documents are available for review at the location listed below. These documents are part of the Administrative Record for the site.

Fresno County Central Library
2420 Mariposa Street
Fresno, CA
(559) 488-3195

EPA Superfund Records Center
95 Hawthorne Street, Suite 403S
San Francisco, CA 94105-3901
Telephone: (415) 536-2000
Fax: (415) 764-4963

Additional Information

For additional copies or other information on the Proposed Plan for the Purity Oil Sales Superfund site, please contact the following:

Rose Marie Caraway
Remedial Project Manager
EPA Region 9 • Superfund
75 Hawthorne Street (SFD-7-2)
San Francisco, CA 94105-3901
Telephone: (415) 972-3158
Fax: (415) 947-3526
e-Mail Address:
caraway.rosemarie@epa.gov

Alhelí Baños
Community Involvement Coordinator
EPA Region 9 • Superfund
Southern California Field Office
600 Wilshire Blvd., Suite 1460
Los Angeles, CA 90017
Telephone: (213) 244-1808
Fax: (213) 244-1850
e-Mail Address: banos.alheli@epa.gov

For your convenience, a Spanish version of this newsletter is available.
Para su conveniencia, una versión español de este boletín está disponible.