



PROPOSED PLAN FOR INSTALLATION RESTORATION SITES 3, 4, 5, AND 6A AT NAVAL STATION LONG BEACH



May 1998

INTRODUCTION

The Department of the Navy (DON) presents to the public this Proposed Plan to *remediate Installation Restoration (IR) Sites 3, 4, 5, and 6A* located at Naval Station (NAVSTA) Long Beach. The contaminants found and the alternatives evaluated to remediate each IR site are presented. A preferred remedial alternative is also discussed for each IR site, including the rationale for its selection.

The DON is issuing this Proposed Plan as part of its public participation responsibilities consistent with section 117(a) of the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* and the *National Contingency Plan (NCP)*. This document summarizes information that can be found in greater detail in the *Remedial Investigation (RI)* report, which includes the *Human Health Risk Assessment (HHRA)*, and the *Feasibility Study (FS)* report. A HHRA was conducted as part of the RI to determine the need for action at each of the IR sites. The RI/FS reports are contained in the *administrative record* for these sites. The administrative record, which contains the information upon which the selection of the response action will be based, is available at the *information repository* located at:

Long Beach Public Library
Government Publications Department
101 Pacific Ave.
Long Beach, CA 90822
(562) 570-7500

The public is encouraged to review and comment on the Proposed Plan and the RI/FS reports. The public comment period is May 8, 1998 through June 8, 1998. A public meeting will also be held on May 27, 1998 so that the public can discuss this Plan with representatives from the Navy and state and federal environmental regulatory agencies.

The DON, with regulatory oversight, is the lead federal agency for response actions under CERCLA. The CERCLA process is being utilized by the DON for site investigation and for evaluation and selection of remedial alternatives for the sites. As the lead agency, the DON will select the final remedy for each site from the four proposed alternatives. The DON is working in cooperation with the California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC), the Los Angeles Regional

Water Quality Control Board (RWQCB), and the U.S. Environmental Protection Agency (U.S. EPA) in the selection of the final remedial alternatives. The final remedy for each site will be selected after the public comment period has ended and the information submitted during that time has been reviewed and considered. The preferred remedial alternatives presented in this Proposed Plan may be modified based on comments received during the public comment period. All public comments received during the comment period will receive a written response and will be included as part of the *Record of Decision (ROD)*, which will officially state the specific remedial alternatives that will be implemented for IR Sites 3, 4, 5, and 6A.

PREFERRED ALTERNATIVES

The preferred alternatives for the four sites addressed in this Proposed Plan are based on an evaluation of results from sampling and testing soil and *groundwater* at these sites. The information from these sites shows that they do not pose a threat to human health under an industrial exposure scenario or to the environment.

Institutional Controls (deed restrictions) are proposed for all four sites to maintain industrial land use.

Groundwater monitoring is proposed for one year at IR Sites 3 and 6A to verify groundwater quality and movement.

(Please see definitions of *italicized* words in the glossary on pages 10 and 11.)

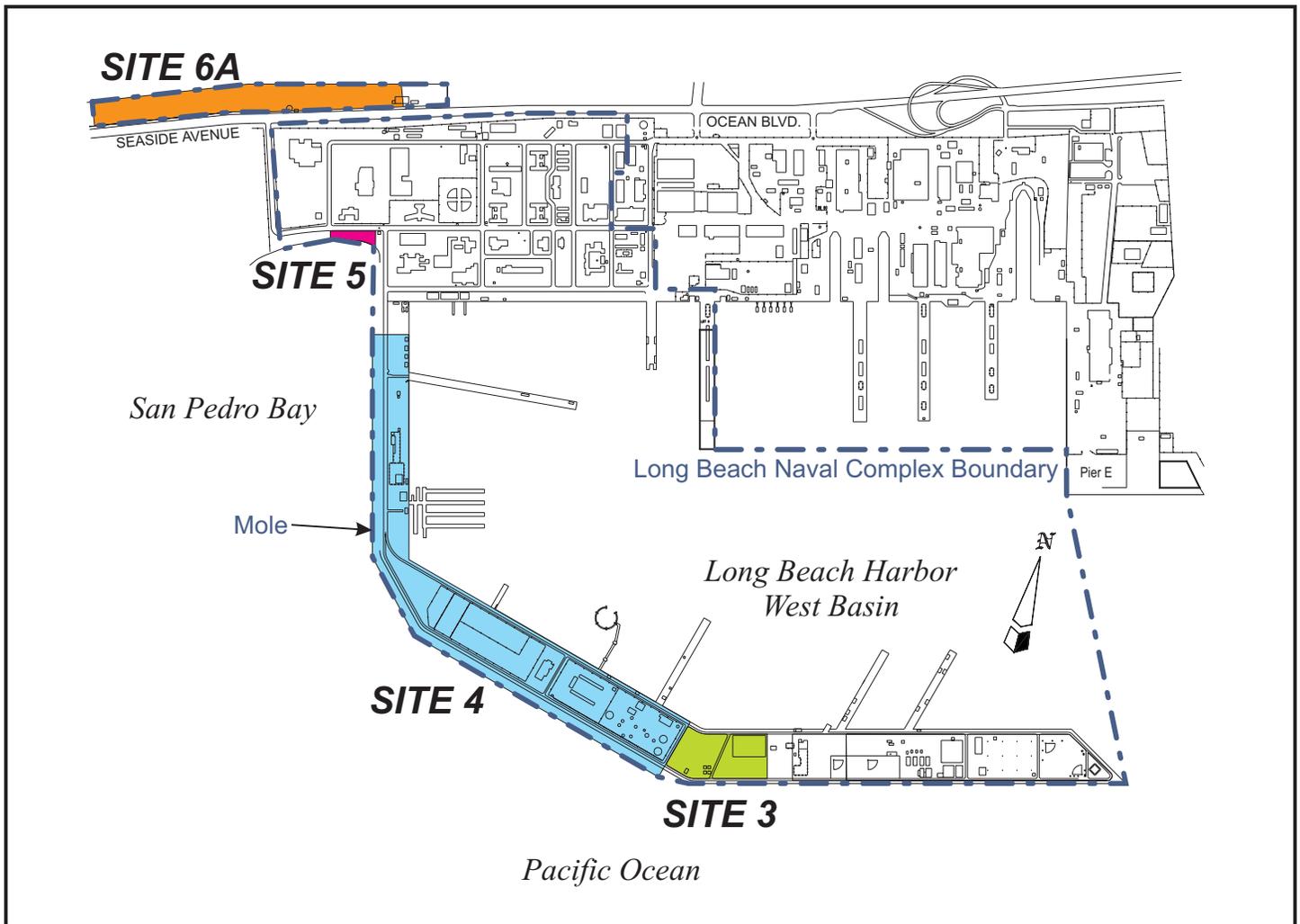


Figure 1. Long Beach Naval Complex

SITE LOCATIONS

The NAVSTA is located in the western portion of the Long Beach Naval Complex (LBNC). The LBNC is made up of the NAVSTA and the Long Beach Naval Shipyard (LBNSY). Figure 1 is a map of the LBNC and shows the locations of IR Sites 3, 4, 5, and 6A.

GENERAL ELEMENTS

Several elements of this Proposed Plan are of a general nature. These elements include general approaches, methodologies, and assumptions that were followed for all four IR sites, as detailed below.

Assessment of Site Risks

As part of the RI, a HHRA was conducted on the groundwater and soil sampled from each of the IR sites to determine the need for action. A risk assessment is a scientific evaluation that uses facts and assumptions to estimate the potential adverse effects on human health from exposure to chemicals. The risk assessment examines two measures of risk: cancer risk and non-cancer risk.

Cancer risk is expressed in terms of the chance of contracting cancer over a human's lifetime due to exposure to site chemicals, and is called the *excess lifetime cancer risk (ELCR)*. For example, the probability of developing cancer from all causes in California is approximately 250,000 out of 1 million (1 in 4). A risk of 1 out of 1 million means that one additional person out of a group of 1 million people may develop cancer as a result of exposure to a chemical. U.S. EPA considers a risk of less than 1×10^{-6} (1 in a million) to be protective of human health, and uses this value as the point of departure. Where the risk is less than 1×10^{-6} (the point of departure) the site or media under consideration is unconditionally acceptable. No *remediation*, monitoring, or site use restrictions will be applied. U.S. EPA also has developed a risk management range represented as 10^{-6} (1 in a million) to 10^{-4} (1 in 10,000) as the target for managing cancer risks at sites where industrial exposure scenarios will be applied. Industrial exposure scenarios are defined in the following paragraph.

Conservative assumptions are used in the risk assessment to ensure that the calculated risk is protective of public health. The assessment assumes an industrial exposure scenario. An industrial exposure scenario encompasses both industrial workers and maintenance/utility workers. An industrial worker is a person who works at a site 8 hours per day, 5 days

a week, 250 days per year for 25 years. An underground utility maintenance worker is a person who repairs buried utility lines at a site 8 hours per day, 10 days per year for 25 years.

Non-cancer health effects are evaluated in terms of a *hazard index* (the ratio of the actual or potential level of exposure to an acceptable level). U.S. EPA uses a hazard index value of less than 1 to represent acceptable non-cancer health effects. Non-cancer hazards significantly above 1 indicate a potential for adverse effects.

Collection and Analysis of Site Data

During the RI, surface and subsurface soil samples, and groundwater samples were collected and analyzed for the presence of chemicals. The types of chemicals include *organic compounds*, such as the chemical components of solvents or oils, and inorganic chemicals such as metals. The lists of chemicals are then evaluated, using a rigorous validation process established by the U.S. EPA to qualify the chemicals detected and to make sure that *data quality objectives* have been met. Chemicals that were confirmed as detected in a particular area of each site are then identified as *chemicals of potential concern (COPCs)* from an *area of potential concern (AOPC)*.

These lists of COPCs can then be compared to risk-based *regulatory threshold levels* or can be evaluated in a HHRA to determine whether they are *chemicals of concern (COCs)*. COCs would be those chemicals which exceed regulatory levels or which are identified in the HHRA as posing a human health risk within the scenarios being evaluated. An AOPC would become an *area of concern (AOC)* if COCs are present. All COPCs from each site were included in the HHRA for that site. Based on the results of the RI and the HHRA there are no COCs or AOCs associated with IR Sites 3, 4, 5, and 6A.

Groundwater Transport Modeling

A computer model was used to evaluate the potential for transfer of COPCs through the groundwater system to off-site *receptors* where different risk-based thresholds might apply. For example, *California Ocean Plan* standards would be more appropriate than human health risk-based standards for the *marine ecosystem*. If the computer model demonstrated that a COPC could be transported and discharged to the bay at a concentration exceeding the appropriate threshold, it would be considered a COC. Based on the results of the groundwater computer *modeling*, none of the COPCs will be transported to the marine ecosystem at concentrations greater than or equal to California Ocean Plan standards.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives were established to allow identification and screening of alternatives that achieve protection of human health and the environment consistent with reasonably anticipated land use. Under the NCP, future land use assumptions are developed and considered when performing risk assessments, developing remedial action alternatives, and selecting a remedy. The NCP permits other-than-residential land use assumptions to be considered when selecting remedies. The *Reuse Plan* for the LBNC includes industrial exposure scenarios and was developed by the local redevelopment authority, which includes members from the community.

The determination of remedial action objectives includes consideration of site-specific risks and *applicable or relevant and appropriate requirements (ARARs)*. Remedial action objectives were developed based on industrial land use, which is consistent with the NCP and the Reuse Plan for LBNC. Industrial land use is the most reasonable anticipated scenario. Also, there are no potable groundwater resources at the site due to the high levels of total dissolved solids in the water. Based on CERCLA, the NCP, the risk assessment in the RI report, and ARARs, the remedial objectives for IR Sites 3, 4, 5, and 6A are as follows:

Groundwater

- Monitor groundwater that may migrate towards marine ecosystems by evaluating groundwater chemical concentrations with respect to California Ocean Plan criteria.
- Maintain industrial and maintenance/utility worker exposure scenarios defined in the RI, thereby preventing human exposure to groundwater containing carcinogens that result in an ELCR greater than 1×10^{-4} .
- Maintain industrial and maintenance/utility worker exposure scenarios defined in the RI, thereby preventing human exposure to groundwater containing chemical concentrations that result in a *chronic toxicity* hazard index greater than 1.

Surface and Subsurface Soil

- Maintain industrial and maintenance/utility worker exposure scenarios defined in the RI, thereby preventing human exposure to soil containing carcinogens that result in a ELCR greater than 1×10^{-4} .
- Maintain industrial and maintenance/utility worker exposure scenarios defined in the RI, thereby preventing human exposure to soil containing chemical concentrations that result in a chronic toxicity hazard index greater than 1.

IR SITE 3, MOLE INDUSTRIAL WASTE DISPOSAL PITS

This site is located on the *mole* and was used from the late 1940s to the early 1970s as a disposal area for liquid and solid industrial wastes. The wastes included oily liquid from ships bilges, industrial process tank bottom sludge (settled material from liquid wastes), hydraulic fluid, acidic waste, *caustic waste*, and trash. The wastes were disposed of in shallow pits or trenches and then covered with the excavated soil.

Summary of Site Risks – IR Site 3

Surface soils in one AOC were identified as being contaminated with arsenic. An interim *removal action* was completed during the RI to remediate the arsenic-contaminated surface soils. Approximately 40 cubic yards of soil were removed from the area and transported to a Class I landfill for disposal of state-defined hazardous waste.

On the basis of site human health risk calculations performed as part of the RI, removal of soil containing arsenic concentrations exceeding 12 milligrams per kilogram (mg/kg) from the AOC has reduced the cancer risk associated with the site to within the U.S. EPA's target range of 10^{-4} to 10^{-6} . The hazard index is below U.S. EPA's acceptable criterion of 1. Please see Table 1 for the actual risk numbers. As a result of the removal action, the area is no longer an AOC and arsenic is not a COC.

No COCs were identified in groundwater at IR Site 3. The calculations performed by the groundwater computer model estimate that the receiving surface waters and harbor sediments will not be affected by transport of the COPCs in IR Site 3 groundwater. A groundwater monitoring program has been implemented for select wells at the site in order to support the results of the chemical transport modeling.

IR SITE 4, MOLE EXTENSION OPERATIONS

This site is located on the mole and was originally constructed as a man-made breakwater and subsequently was filled to extend the width of the mole. The fill material included sand blast grit, construction and demolition debris, ships' keel blocks, trash, and soil. Additionally, this area was used for the storage and transfer of diesel and motor fuel, the storage of miscellaneous equipment and materials, and the long-term storage of deployed personnel vehicles.

Summary of Site Risks – IR Site 4

No COCs were identified in soils or in groundwater at IR Site 4.

The overall site human health risk, based on an industrial scenario, fell within U.S. EPA's target range of 10^{-4} to 10^{-6} . The hazard index is below U.S. EPA's acceptable criterion of 1. Please see Table 1 for the actual risk numbers.

The calculations performed by the groundwater computer model estimate that the receiving surface waters and harbor sediments will not be affected by transport of the COPCs in IR Site 4 groundwater. A groundwater monitoring program was implemented for selected wells at the site in order to support the results of the chemical transport modeling. The RWQCB has determined, based on the results of the groundwater monitoring, that the concentrations of COPCs are stable and do not pose a threat to the marine ecosystem. Therefore, the monitoring program was discontinued.

IR SITE 5, SKEET RANGE SOLID WASTE FILL AREA

This site is located on the mainland of NAVSTA. From the late 1930s to 1968, the area was used for the disposal of solid waste, including bed frames, desks, fire brick, and construction debris from different sources at the LBNC. There are no indications that this area was used as a *skeet range* during that period. No industrial wastes were reported disposed at this site.

Summary of Site Risks – IR Site 5

No COCs were identified in soils or in groundwater at IR Site 5.

The overall site risk based on an industrial scenario falls within U.S. EPA's target range of 10^{-4} to 10^{-6} . The hazard index is below U.S. EPA's acceptable criterion of 1. Please see Table 1 for the actual risk numbers.

The calculations performed by the groundwater computer model estimate that the receiving surface waters and harbor sediments will not be affected by transport of the contaminants in IR Site 5 groundwater.

Table 1. Results from the HHRA at IR Sites 3-6A

Site ID	Estimates of Risk	Industrial Worker ^(b)	Maintenance/Utility Worker ^(c)		
			Soil	Groundwater	Total
IR Site 3 ^(a)	ELCR	8.0×10^{-6}	5.9×10^{-5}	1.8×10^{-6}	6.1×10^{-5}
	Hazard Index	<1	0.45	0.0078	0.46
IR Site 4	ELCR	4.0×10^{-8}	7.6×10^{-7}	4.0×10^{-7}	1.2×10^{-6}
	Hazard Index	0.05	0.019	0.0094	0.029
IR Site 5	ELCR	9.2×10^{-6}	1.6×10^{-6}	9.6×10^{-8}	1.7×10^{-6}
	Hazard Index	0.20	0.028	0.00058	0.029
IR Site 6A	ELCR	2.5×10^{-6}	9.5×10^{-7}	2.6×10^{-7}	1.2×10^{-6}
	Hazard Index	0.14	0.027	0.0019	0.029

ELCR = Excess Lifetime Cancer Risk

(a)The industrial worker ELCR and Hazard Index for IR Site 3 as shown in Table 1 were recalculated after removal of the arsenic-contaminated soils. All other risk numbers shown are as reported in the RI.

(b)The HHRA for the industrial worker scenario is based on exposure to surface soil conditions only.

(c)The HHRA for the maintenance/utility worker scenario is based on exposure to surface and subsurface soil conditions, and groundwater, which could enter an excavation.

The HHRA indicates that risks due to groundwater for the maintenance/utility workers are less than the point of departure. As a result of the absence of COCs, the results of the computer model, and the low health risks, the site is not a candidate for groundwater monitoring.

IR SITE 6A, BOAT DISPOSAL LOCATION

This site is located on the mainland of NAVSTA, north of Ocean Boulevard/Seaside Avenue. The site consists of a scrap yard and vacant lot. The vacant lot area was used as a disposal location by the Navy from approximately 1942 until 1965. Disposed items, thought to include old boats, sandblast wastes, and shipyard solid wastes, were placed in shallow trenches and covered with soil. Oil may have been applied for dust suppression. At the time of the RI, the site was used as a scrap yard for discarded refrigerators and stoves, spare parts from ships, water heaters, outmoded vehicles and boats, and discarded machining tools. Records indicate that a portion of the site was used for storage of paint cans, paint wastes, thinners, oil, and grease. Storage operations ceased in 1994.

Summary of Site Risks – IR Site 6A

No COCs were identified in soils or in groundwater at IR Site 6A.

The overall site risk based on an industrial scenario falls within U.S. EPA's target range of 10^{-4} to 10^{-6} . The hazard index is below U.S. EPA's acceptable criterion of 1. Please see Table 1 for the actual risk numbers.

Groundwater sampling and monitoring activities completed at IR Site 6A as part of supplemental RI activities and during routine groundwater monitoring demonstrate the concentrations of COPCs present at the site are below California Ocean Plan screening levels. Also, groundwater in this area is generally flowing away from the marine ecosystem. A groundwater monitoring program has been implemented for selected wells at the site to support the results of the groundwater modeling.

SUMMARY OF ALTERNATIVES

Potential approaches for meeting the remedial action objectives for IR Sites 3, 4, 5, and 6A are briefly described below. Based on the summary evaluations of the RI report, and as a result of the removal action at Site 3, no COCs or AOCs are present at IR Sites 3, 4, 5, and 6A. Because the overall site risk, based on an industrial exposure scenario, falls within U.S. EPA's target range of 10^{-4} to 10^{-6} , cleanup of soils and groundwater at the sites is not warranted. Remedial alternatives that preserve the reasonably anticipated land use, and/or monitoring the site for changes in groundwater flow and contaminant transport were evaluated in the detailed analysis presented in the FS.

Capital costs and annual *operation and maintenance* (O&M) costs were estimated based on assumptions that can be obtained from the FS. All costs and implementation times for each approach are estimated.

Alternative 1 – No Further Action (NFA)

Capital Cost: \$0
Annual O&M Cost: \$0
Months to Implement: None

The NFA alternative implies that no activities will be implemented to remediate contaminants at the site. The NCP requires that the NFA alternative be evaluated for every site to establish a baseline against which to compare and evaluate other alternatives.

Alternative 2 – Institutional Controls (Deed Restrictions)

Capital Cost: \$24,000 (\$6,000 per site includes all four sites)
Annual O&M Cost: \$0
Months to Implement: 3

Institutional controls are non-engineering mechanisms and legal measures designed to limit access or activities at a particular property. They may be used as part of an environmental remedy to limit exposure pathways to humans or to the environment from contamination that may be present at a site, or to protect a remedy that is in place. Deed restrictions are a type of institutional control and would be applied here to limit groundwater use and ensure that the site remains industrial.

Alternative 3 – Long-Term Groundwater Monitoring

Capital Cost: \$0
Annual O&M Cost: \$148,000 (\$74,000 per site – includes IR Sites 3 and 6A)
Months to Implement: 12

Long-term groundwater monitoring is an effective tool for evaluating whether remedial action objectives are being met. It is useful in monitoring COPC concentrations and *plume* movements.

The groundwater monitoring network for IR Sites 3 and 6A are already in place, resulting in \$0 for capital costs. Groundwater monitoring for IR Sites 3 and 6A is expected to continue for one more year. At the end of that period the stability of the plume will be evaluated and a determination made as to whether the monitoring program should be extended. The 12 months to implement is based on the one-year monitoring period.

Alternative 4 – Combined Approach – Institutional Controls and Long-Term Groundwater Monitoring

Capital Cost: \$24,000 (\$6,000 per site includes all four sites)
Annual O&M Cost: \$148,000 (\$74,000 per site – includes IR Sites 3 and 6A)
Months to Implement: 12

Deed restrictions combined with long-term groundwater monitoring will ensure that future site use remains industrial and that remedial action objectives are being met. The same groundwater monitoring program assumptions described for Alternative 3 apply here.

EVALUATION OF ALTERNATIVES AND SELECTION OF THE PREFERRED ALTERNATIVE

The preferred alternative for IR Sites 3 and 6A is the combination of deed restrictions and long-term groundwater monitoring. The preferred alternative for IR Sites 4 and 5 is the implementation of deed restrictions. These preferred alternatives appear to provide the best balance of performance with respect to nine criteria that the U.S. EPA uses to evaluate alternatives. This section profiles the performance of the preferred alternatives against the nine criteria, noting how each compares to other options under consideration. It should be noted that a long-term groundwater monitoring program is currently in place at the Long Beach NAVSTA for IR Sites 3 and 6A and has collected data over the past year. Groundwater monitoring was conducted for one year at IR Site 4.

The nine evaluation criteria for the remedial action alternatives are listed below:

- Overall Protection of Human Health and the Environment
- Compliance with ARARs
- Long-Term Effectiveness
- Reduction of Toxicity, Mobility, or Volume of Contaminants
- Short-Term Effectiveness
- Implementability
- Cost
- State Acceptance
- Community Acceptance

Each alternative has undergone detailed evaluation and analysis, using the evaluation criteria developed by the U.S. EPA. The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The threshold criteria must be satisfied in order for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives. Generally, the modifying criteria are taken into account after public comment is received on the Proposed Plan and reviewed with the various state regulatory agencies to determine if the preferred alternative remains the most appropriate remedial action. The nine criteria are defined below and are accompanied by the key points from the evaluation of the four alternatives.

THRESHOLD CRITERIA

Overall Protection of Human Health and the Environment

This criterion assesses whether an alternative provides adequate public health protection and describes how health risks posed by the site will be eliminated, reduced, or controlled through treatment, engineering controls, or institutional and regulatory controls.

All alternatives, except for the NFA Alternative, are considered protective of human health and the environment under an industrial land use scenario. Alternative 2, deed restrictions, would provide a means to preserve the anticipated industrial site use. In the event that future land use changes, risk scenarios may no longer be valid.

Alternative 3, long-term groundwater monitoring, would provide additional protection by observing changes in groundwater movement and quality and comparing those observations to conditions observed during the RI and to the groundwater transport model results. Groundwater monitoring would also be used to determine whether contaminant concentrations exceed levels that threaten human health and the environment. Long-term groundwater monitoring is currently ongoing at IR Sites 3 and 6A and has been completed at IR Site 4.

Compliance with ARARs

Compliance with ARARs addresses whether a selected remedy will meet all related federal and state environmental statutes or requirements. An alternative must comply with ARARs (or be covered by a waiver) to be acceptable.

All of the alternatives comply with ARARs.

PRIMARY BALANCING CRITERIA

Long-Term Effectiveness

This criterion addresses the ability of a potential remedy to maintain reliable protection of human health and the environment over time, after the remedial action objectives have been accomplished.

The NFA alternative provides only limited long-term effectiveness because there is no provision for ensuring industrial land use. Properly instituted deed restrictions (Alternative 2) can effectively limit land use options. Groundwater monitoring will detect changes in site groundwater quality and flow conditions, but requires periodic sampling and analysis of environmental media. The groundwater monitoring schedule calls for quarterly monitoring for a period of one year. None of the alternatives selected will reduce contaminant concentrations or reduce the potential for continued transport of contaminants. However, since only low concentrations of chemicals were detected at the sites, under the industrial exposure scenario no COCs or AOCs are present at IR Sites 3, 4, 5, and 6A; therefore, *conventional remedial technologies* are not required to minimize potential contaminant exposure.

Reduction of Toxicity, Mobility, or Volume of Contaminants

The evaluation of this criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, and/or volume of contaminants.

None of the alternatives reduce the toxicity, mobility, or volume of COPCs at IR Sites 3, 4, 5, and 6A. This criterion does not have to be met where the sites are already in a protective state. Based on the HHRA and the groundwater modeling results, current site conditions are protective of human health under the industrial exposure scenario and are protective of the environment.

Short-Term Effectiveness

The evaluation of short-term effectiveness addresses how well human health and the environment will be protected from impacts due to construction and implementation phases of a remedial alternative.

Under the industrial risk scenario, no COCs or AOCs are present at IR Sites 3, 4, 5, and 6A; therefore, conventional remedial technologies and associated construction activities are not needed. Groundwater monitoring will have little impact during implementation.

Implementability

Evaluation of implementability addresses the technical and administrative feasibility of implementing an alternative, including an evaluation of the availability of technologies, services, and materials required during implementation.

NFA would be the easiest alternative to implement at each site, since it does not require any further action. Deed restrictions (Alternative 2) could be imposed by existing legal mechanisms. Alternative 3, long-term monitoring, is currently ongoing at the NAVSTA at IR Sites 3 and 6A.

Cost

Evaluation of cost addresses the total cost of the remedial action including capital and O&M costs.

There would be no additional costs associated with NFA. Deed restrictions cost would be relatively small. Long-term groundwater monitoring costs would be moderate depending on the period of time necessary to evaluate contaminant modeling performed in the RI. The costs as presented assume that groundwater monitoring will continue for one more year at IR Sites 3 and 6A; IR Site 4 groundwater monitoring is completed.

MODIFYING CRITERIA

State Acceptance

Evaluation of this criterion addresses the apparent acceptability of the alternative to California State regulatory personnel. The evaluation of state acceptance presented in the FS is qualitative and will be fully addressed during the public comment period and preparation of a ROD.

RWQCB concurs with the recommendations of the FS at IR Sites 3, 4, 5, and 6A.

Community Acceptance

Evaluation of this criterion addresses the apparent acceptability of the alternative by the community. The evaluation of community acceptance presented in the FS is qualitative and will be fully addressed during the public comment period and preparation of a ROD.

SUMMARY OF PREFERRED ALTERNATIVES AT IR SITES 3 AND 6A

The combined approach (Alternative 4), which includes deed restrictions and long-term groundwater monitoring, appears to offer the best balance of performance for IR Sites 3 and 6A. Based on the RI, including the HHRA, the groundwater model, and the arsenic-contaminated soil removal at IR Site 3, there are no COCs or AOCs at the sites. The industrial risk calculated by the HHRA falls within U.S. EPA's target range of 10^{-4} to 10^{-6} and therefore conventional remediation technologies are not warranted. The following paragraphs briefly describe the rationale for selecting deed restrictions and long-term groundwater monitoring.

Deed restrictions are recommended as a method to prevent changes in future land use that may increase exposure risks at IR Sites 3 and 6A. Deed restrictions would be implemented using existing legal procedures and would ensure that land usage at the sites remains industrial. Examples of deed restrictions could include but are not limited to provisions to prevent disturbance of monitoring systems and restrictions on land use for residential purposes, types of construction allowed, or use of groundwater.

The current quarterly groundwater monitoring is necessary to ensure that migration of groundwater to marine ecosystems at concentrations in excess of the California Ocean Plan criteria is not occurring. The groundwater monitoring program at IR Sites 3 and 6A is expected to continue for one more year.

Based on information that is currently available, the DON expects that the preferred alternative satisfies the statutory requirements in CERCLA section 121(b) that the selected alternative:

- Be protective of human health and the environment
- Comply with ARARs
- Be cost-effective
- Utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and
- Satisfy the statutory preference for treatment as a principal element, or justify not meeting the preference.

The preference for selection of permanent treatment solutions is not needed for these sites based on the results of the HHRA and available groundwater monitoring data. Human health risk falls within U.S. EPA's target range of 10^{-4} to 10^{-6} for industrial exposure scenarios. It is reasonable to anticipate that the site will continue to be utilized as industrial property. No risk due to human health or to the marine ecosystem due to groundwater has been identified.

SUMMARY OF THE PREFERRED ALTERNATIVE AT IR SITES 4 AND 5

Deed restrictions (Alternative 2) appear to offer the best balance of performance for IR Sites 4 and 5. There are no COCs or AOCs at either site. Industrial risk calculated by the HHRA falls within U.S. EPA's target range of 10^{-4} to 10^{-6} . After the submittal of the FS, the RWQCB determined that groundwater monitoring at IR Site 4 had demonstrated that the groundwater COPC plume is stable and is not a threat to human health or to the environment. Therefore the groundwater monitoring program at IR Site 4 was discontinued. Risk at IR Site 5 due to groundwater is less than the U. S. EPA point of departure. Therefore conventional remediation technologies or groundwater monitoring are not warranted for IR Sites 4 and 5. The following paragraph briefly describes the rationale for selecting deed restrictions.

Deed restriction is recommended because it is effective in preventing changes in future land use that may increase exposure risks at IR Sites 4 and 5. Deed restriction ensures overall protection of human health and the environment. Industrial risk for groundwater at IR Sites 4 and 5 is below the U.S. EPA-defined departure point and is considered unconditionally acceptable. Therefore access restrictions and groundwater monitoring are not warranted.

Based on information that is currently available, the DON expects that the preferred alternative satisfies the statutory requirements in CERCLA section 121(b) that the selected alternative:

- Be protective of human health and the environment
- Comply with ARARs
- Be cost-effective
- Utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and
- Satisfy the statutory preference for treatment as a principal element, or justify not meeting the preference.

The preference for selection of permanent treatment solutions is not needed for these sites based on the results of the HHRA and available groundwater monitoring data. Human health risk falls within U.S. EPA's target range of 10^{-4} to 10^{-6} for industrial exposure scenarios. It is reasonable to anticipate that the site will continue to be utilized as industrial property. No risk due to human health or to the marine ecosystem due to groundwater has been identified.

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

COMMENT PERIOD AND PUBLIC MEETING:

The 30-day public comment period is May 8, 1998 through June 8, 1998. Upon timely request, the Navy will extend the public comment period by a minimum of 30 additional days.

A public meeting will be held on May 27, 1998 at 7:00 PM at the Navy/Marine Caretaker Site Office (Bldg 686), off Navy Way and Ocean Blvd, adjacent to the former Naval Station Long Beach (Enter via Navy Way)

COMMUNITY RELATIONS CONTACTS:

Ms. Marsha Mingay
Public Participation Specialist
Region 4 Office of Military Facilities
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630
(714) 484-5416

Mr. Lee Saunders
Environmental Public Affairs Office
SW Division Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190
(619) 532-3100

ADMINISTRATIVE RECORD AND INFORMATION REPOSITORIES:

Long Beach Public Library
Government Publications Department
101 Pacific Avenue
Long Beach, CA 90822
(562) 570-7500
Hours: Mon (10-8), Tu-Sat (10-5:30), Sun (12-5)

Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway, Building 129
San Diego, CA 92132
(619) 532-1144

TECHNICAL INFORMATION CONTACTS:

Mr. Alvaro Gutierrez
Remedial Project Manager
California EPA
Department of Toxic Substances Control
5796 Corporate Way
Cypress, CA 90630
(714) 484-5417

Mr. Martin Hausladen
Remedial Project Manager
Hazardous Waste Management Division (H-9-2)
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105
(415) 744-2388

Mr. Alan Lee
BRAC Environmental Coordinator
Southwest Division
Naval Facilities Engineering Command
1420 Kettner Boulevard
San Diego, California 92101
(619) 532-4748

Mr. Thomas L. Macchiarella, Jr.
Lead Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
1420 Kettner Boulevard, Suite 507
San Diego, CA 92101
(619) 532-4814

Mr. Hugh Marley
California Regional Water Quality Control Board
Los Angeles Region
101 Centre Plaza Drive
Monterey Park, CA 91754-2156
(213) 266-7669

GLOSSARY

Administrative Record – A collection of all documents used to select and justify remedial alternatives and selected actions at LBNC. These documents are available for public review.

Applicable or Relevant and Appropriate Requirements (ARARs) – The federal and state laws and regulations that must be followed for the selected remedy.

Area of Concern (AOC) – An area delineated within a CERCLA site at concentrations exceeding threshold criteria where contamination is present

Area of Potential Concern (AOPC) – An area delineated within a CERCLA site where potential for contamination is similar based on site history, physical characteristics, and compounds present in groundwater or soil samples collected during the RI.

Background – Naturally occurring levels of a chemical in the environment. The term is typically used to describe ambient concentrations of trace metals (e.g., arsenic) in the environment that have not been influenced by humans.

California Ocean Plan – Guidelines established by the State of California to protect ocean water and the marine ecosystem from pollutants.

Caustic Waste – A type of waste that strongly irritates, burns, corrodes or destroys living tissues.

Chemical of Concern (COC) – A chemical compound or element present at concentrations that exceed regulatory or risk-based thresholds and would pose a threat to human health or the environment.

Chemical of Potential Concern (COPC) – A chemical compound or element which was identified as present in groundwater or soil samples collected during the RI.

Chronic Toxicity – A persistent property of a chemical that results in a harmful effect over prolonged exposure.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – Commonly referred to as Superfund, authorizes federal action to respond to the release, or threat of release, into the environment of hazardous substances, pollutants, or contaminants that may present an imminent or substantial danger to public health or welfare.

Conventional Remedial Technologies – Well-established, readily-available technologies that have been demonstrated in the treatment of contaminants at many different sites and under varying site conditions. Examples of conventional remedial technologies include; groundwater pump-and-treat, and dig-and-haul.

Data Quality Objectives – Objectives that determine the number of sampling locations and types of samples needed, the methods used to identify and quantify COPCs and analytical detection limits. They are intended to specify the level of uncertainty in sample results and thereby the quality of the data.

Excess Lifetime Cancer Risk (ELCR) – The chance of contracting cancer over a human's lifetime due to exposure to site chemicals. U.S. EPA has developed a risk management range of 10^{-4} (1 in 10,000) to 10^{-6} (1 in a million) as the target for managing risk.

Feasibility Study (FS) – An engineering evaluation of technologies that may be used to clean up a site. The study looks at site conditions, potential technical problems, costs, and human and ecological impacts to determine how effective the technologies may be.

Groundwater – Water beneath the ground surface that fills spaces between soil particles. Groundwater at LBNC is not potable due to high naturally occurring mineral content.

Hazard Index – The ratio of actual or potential level of exposure to an acceptable level of exposure for a given chemical. The index is used to evaluate non-cancer health effects. U.S. EPA recognizes a hazard index of less than 1 to represent acceptable non-cancer risk.

Human Health Risk Assessment (HHRA) – A mathematical process which quantifies the risk to human health from exposure to chemicals.

Information Repository – The physical location where a collection of site information is maintained. It contains copies of documents available for public review.

Installation Restoration (IR) Site – Areas designated under the Navy's program to identify, investigate, assess, characterize, cleanup or control releases of hazardous substances. It is the Navy's program to comply with CERCLA requirements.

Institutional Controls – A legal or institutional mechanism that limits access to or use of property, or warns of a hazard (i.e., land use restrictions imposed by the property owner contained in a property deed).

Marine Ecosystem – The plants, animals, other organisms, and habitat present in the ocean waters, intertidal area, and sediments surrounding the mole and along the LBNC shore line.

Modeling – The use of a mathematical model to simulate a physical process. For example, a fate and transport model was used to determine if COPCs would migrate through the groundwater and adversely impact the marine ecosystem.

Mole – The breakwater that includes IR Sites 1, 2, 3, and 4 at LBNC and that extends out into the Pacific Ocean to form Long Beach Harbor West Basin.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) – A regulation issued by the U.S. EPA to implement the requirements of CERCLA.

No Further Action (NFA) – The conclusion that no additional site environmental activities, beyond the RI/FS, are necessary. Used as a baseline for comparison for site alternatives identified in the FS.

Operation and Maintenance (O&M) – Forecast activities and their associated costs necessary to operate and maintain a site activity or technology. For example, groundwater monitoring O&M would include groundwater sample collection, laboratory analysis, report preparation, and inspection/maintenance of the wells.

Organic Compound – Chemical compounds that contain the element carbon.

Plume – A zone within the groundwater system where non-naturally occurring chemicals are present or where naturally occurring chemicals are present at concentration above *background*.

Receptors – A term used in the HHRA to describe persons likely to be exposed to contaminants present at a site.

Record of Decision (ROD) – A report that documents how a site will be cleaned up and why the cleanup method was selected.

Regulatory Threshold Level – Criteria set by federal and state regulatory agencies to determine allowable concentrations of contaminants in soils and groundwater. An example of a regulatory threshold level is the California Ocean Plan.

Remedial Action – Is the final measure taken as a permanent remedy. It may take an extended period of time and may allow a certain level of contamination to remain on site.

Remedial Investigation (RI) – Field study that includes collecting soil and groundwater samples to evaluate what type of and how much contamination is present at a site.

Remediate/Remediation – Any active or passive environmental activity that results in the reduction of toxicity, mobility, or volume of contaminants at a site.

Removal Action – A CERCLA action that often is the first response to a release or threatened release. It may be either an interim measure or final solution. Removal actions may occur at any time in the CERCLA process.

Reuse Plan – Refers to the written plan developed by the local redevelopment authority, which includes members from the community.

Skeet Range – Small-arms firing range (without bullet impact berms) where clay disk targets (clay pigeons) are discharged from houses at the side of the range at random angles. Contaminants associated with bullets and clay pigeons include lead, other heavy metals, and polycyclic aromatic hydrocarbons.

MAILING LABEL

Mr. Lee Saunders
Environmental Public Affairs Office
SW Division Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

Public Meeting

**A public meeting will be held on May 27, 1998
at 7:00 PM at:**

**Navy/Marine Caretaker Site Office (Bldg 686)
off Navy Way and Ocean Blvd,
adjacent to the former Naval Station Long Beach
(Enter via Navy Way)**

**The public is invited to the meeting
to discuss the preferred alternatives for
Installation Restoration Sites 3, 4, 5, and 6A
at Naval Station Long Beach.**