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PROPOSED PLAN FOR SITE 5 TRANSFORMER STORAGE BONEYARD, SITE 9 CAMP MOFFETT RAVINE FILL AREA, AND SITE 21 BUILDINGS 1517/1506 AREA NSTC GREAT LAKES IL

2/1/2014

NAVFAC MIDWEST

Proposed Plan for Site 5 - Transformer Storage Boneyard, Site 9 - Camp Moffett Ravine Fill Area, and Site 21 - Buildings 1517/1506 Area Naval Station Great Lakes Installation Restoration Program Great Lakes, Illinois

About This Document

This Proposed Plan is being presented to satisfy the statutory and regulatory requirements for public participation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Its primary intent is to help the public understand and provide input on the proposed cleanup alternatives to address impacted surface soil, subsurface soil, and/or groundwater at Site 5 - Transformer Storage Boneyard, Site 9 - Camp Moffett Ravine Fill Area, and Site 21 - Buildings 1517/1506 Area at Naval Station Great Lakes (NSGL) in Great Lakes, Illinois. The Department of the Navy, with the concurrence of Illinois Environmental Protection Agency (Illinois EPA), developed this plan to summarize the Preferred Alternatives for these sites.

The Navy, the lead agency, is accepting formal public comments on this Proposed Plan from March 14 to April 14, 2014. The Navy, with input from Illinois EPA (the support agency), will make a final remedy selection after reviewing and addressing the public comments. Therefore, the public is encouraged to review and comment on the information presented in this Proposed Plan. The final remedy has not yet been determined and could change in response to public comments or based on receipt of new information.

This Proposed Plan highlights key information from the Remedial Investigation (RI) and Focused Feasibility Study (FFS) reports. More complete information can be found in these reports, which are included in the Administrative Record available for review at NSGL, 201 Decatur Avenue, Building 1A, Environmental Division, Great Lakes, Illinois, 60088, or online at http://go.usa.gov/DyNB. From this website, click on "Administrative Records," select the "Administrative Record File", and search for "SITE 5," "SITE 9," and "SITE 21" in the Basic Search box.

The Proposed Plan

This Proposed Plan describes the Navy's proposed cleanup approach for Site 5 - Transformer Storage Boneyard, Site 9 - Camp Moffett Ravine Fill Area, and Site 21 - Buildings 1517/1506 Area at Naval Station Great Lakes (NSGL) in Great Lakes, Illinois. To address contaminated surface and subsurface soil and groundwater at Sites 5, 9, and 21, the Navy, with the concurrence of Illinois EPA, proposes alternatives that will include the following components to meet the remedial action objectives (RAOs) for each site:

Land Use Controls (LUCs) – Because the contaminant concentrations in soil and groundwater exceed risk-based health standards for potential future residents, areas of Sites 5, 9, and 21 will be restricted to industrial/commercial (I/C) (nonresidential) use, and worker cautions would be required to address hazards associated with contaminants present in soil. Under current conditions exposure of I/C and construction workers to contaminated soil is prevented by the soil cover, parking lots, and buildings at Sites 5, 9, and 21. Illinois EPA and the Navy have signed a LUC Memorandum of Agreement (MOA) that includes a Naval Station Policy Letter restricting use of groundwater on the NSGL property. The LUCs will continue these current restrictions. LUCs will include property restrictions and would be incorporated into the Base Master Plan to make sure that restrictions are applied and enforced at the sites.

Barriers – Existing barriers of soil, pavement, and buildings will be inspected and maintained to prevent direct exposure to contaminated soil.

Five-Year Reviews – As required under CERCLA when contaminants remain on site above levels acceptable for unrestricted use, Five-Year Reviews would be conducted to evaluate the protectiveness of the selected remedy to determine if the remedy is and will remain protective of human health. Evaluation and determination of protectiveness would be based on data and observations collected during the review process.

Let Us Know What You Think

Public Comment Period: March 14 to April 14, 2014

You don't have to be a technical expert to comment. If you have a concern, question, suggestion, or preference, the Navy and Illinois EPA want to hear it before making a final decision on how to protect our community. The Navy, as the lead agency, is accepting formal public comments on this Proposed Plan for a 30-day period from March 14, 2014. To comment formally, send written comments postmarked no later than April 14, 2014 to:

Department of the Navy
Naval Station Great Lakes
NAVFAC Midwest
Attn: Terese Van Donsel
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, IL 60088

Or e-mail comments by the end of the comment period to: terese.vandonsel@navy.mil.

The Navy will provide written responses to all comments in the Responsiveness Summary included as part of the final Record of Decision (ROD).

The Navy will provide an opportunity for a public meeting during the public comment period if significant interest is expressed and a formal written request is made. The public will be notified of the date, time, and location through the local news media. At the meeting, the Preferred Alternatives will be discussed and questions about the recommended remedial actions will be received.

Facility Description

NSGL is located in Lake County, Illinois, north of the City of Chicago, and encompasses 1.5 miles of Lake Michigan shoreline (see Figure 1). NSGL is used to support Naval training and consists of the Recruit Training Command, Training Support Center, and Naval Facilities Engineering Command Midwest. Sites 5, 9, and 21 are part of a comprehensive environmental investigation and cleanup program currently being performed at NSGL for 22 areas of potential hazardous material releases. The sites are being evaluated with respect to contamination characteristics, migration pathways, and pollutant receptors. Several of these sites warranted further investigation to assess potential long-term impacts, including Site 5, Site 9, and Site 21, because historical site activities at these sites may have resulted in soil

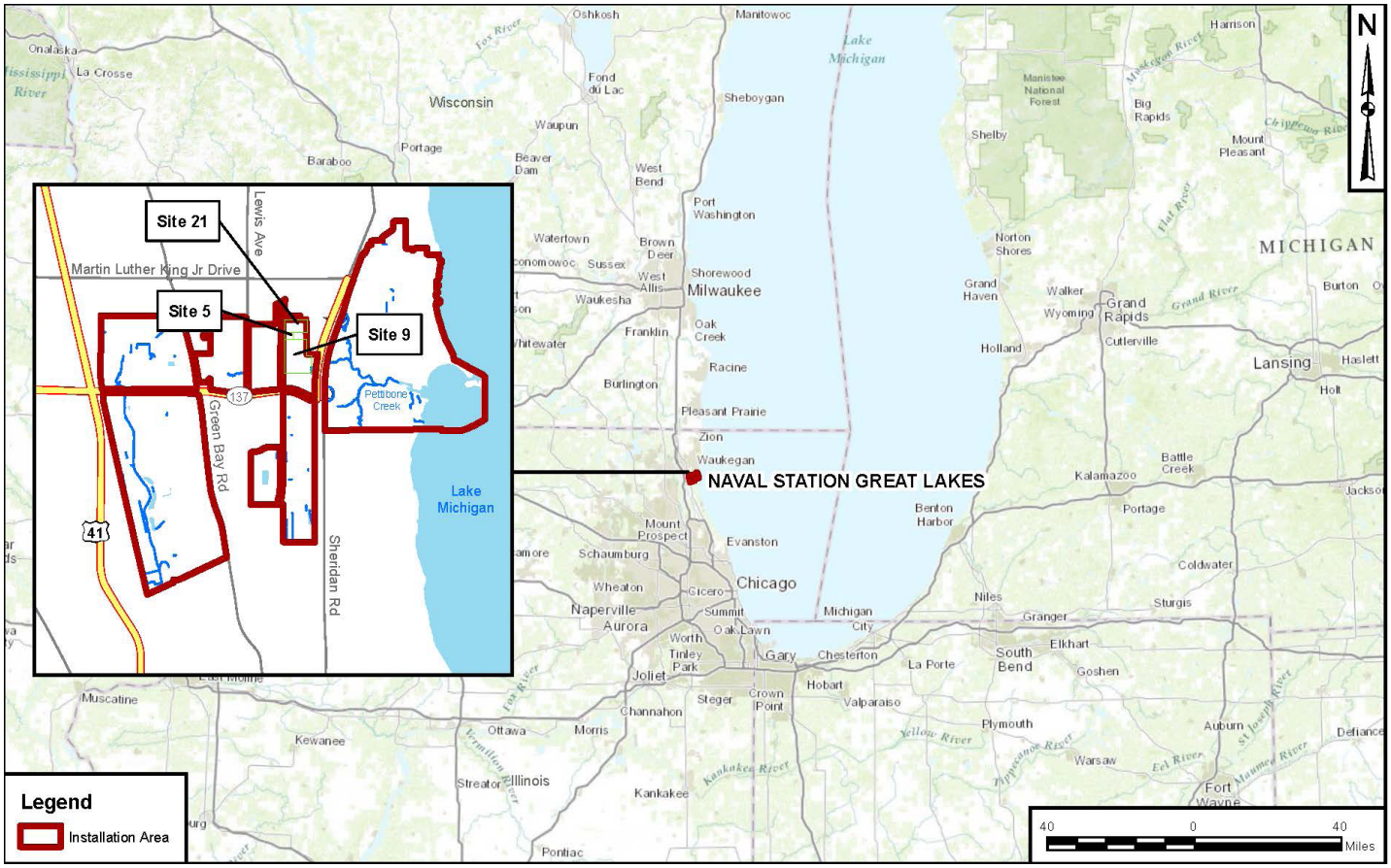


Figure 1: Vicinity Map

and/or groundwater contamination. Separate RIs were conducted for Sites 5, 9, and 21; however, Sites 5, 9, and 21 were addressed together in an FFS because of their proximity to each other and their similar geology, hydrogeology, and contaminated media. For these reasons, Sites 5, 9, and 21 are discussed in this Proposed Plan.

Site descriptions including site history and previous investigations, nature and extent of contamination, human health risks, and remedial actions for each of the sites are discussed separately in site-specific sections. The information presented prior to the site-specific sections is applicable to Sites 5, 9, and 21.

Site Background and Characteristics

Sites 5, 9, and 21 are located adjacent to each other at the northern end of NSGL and together cover approximately 30 acres of the facility (Figure 2). These sites are located on relatively flat terrain that creates poorly defined drainage patterns.

Groundwater flow at these sites is generally in a southeastern direction; therefore, groundwater contamination from Site 21 (northernmost site) has the potential to impact both Site 5 and Site 9. Site 5 has the potential to impact groundwater at Site 9 (downgradient), but is unlikely to affect groundwater at Site 21 (upgradient). There are no drinking water wells located on or immediately downgradient of these sites that could be impacted. The silt and pebbly clay in the surficial aquifer underlying the facility is not productive enough to allow free groundwater movement, and therefore is not considered to be a viable source of groundwater for drinking water. Because of existing groundwater use restrictions at NSGL and the City of North Chicago (Ordinance 11-7-2), groundwater cannot be used for drinking water. The facility and the area surrounding the facility are supplied by a public water system.

Site activities that may have resulted in contamination of soil and groundwater at Sites 5, 9, and 21 include: (1) storage of coal, transformers, equipment, waste/scrap material, (2) fueling activities, (3) disposal of galley-type wastes, and/or (4) leaks associated with underground storage tanks (USTs). Separate investigations were conducted at each site to identify the type and extent of chemicals in soil and groundwater. Polynuclear aromatic hydrocarbons (PAHs) and metals were identified as chemicals of concern (COCs) in soil and volatile organic chemicals (VOCs), PAHs, and metals were identified as COCs in groundwater. Given the similar contamination at the sites and their proximity, the remedial alternatives for these sites were evaluated collectively.

Scope and Role

Sites 5, 9, and 21 are three of the 22 areas of potential hazardous material releases that were identified as part of the environmental investigation and cleanup program at NSGL. The proposed remedial actions presented in this document are expected to be the final remedies for Sites 5, 9, and 21. The other identified sites at NSGL are in various stages of being investigated and remediated (e.g., no further action at five sites, RODs signed for three sites, RODs are being prepared for two sites, and two sites were remediated).

Evaluation of Site Risks

Figure 3 presents the conceptual site model (CSM) which identifies contaminant sources, contaminant release mechanisms, transport routes, and receptors under current and future land use scenarios.

Risk assessments were conducted for each site and considered current land use and future use scenarios. A description of how human health risks are evaluated is presented in the box on page 5. Under current industrial land use, access to and use of the

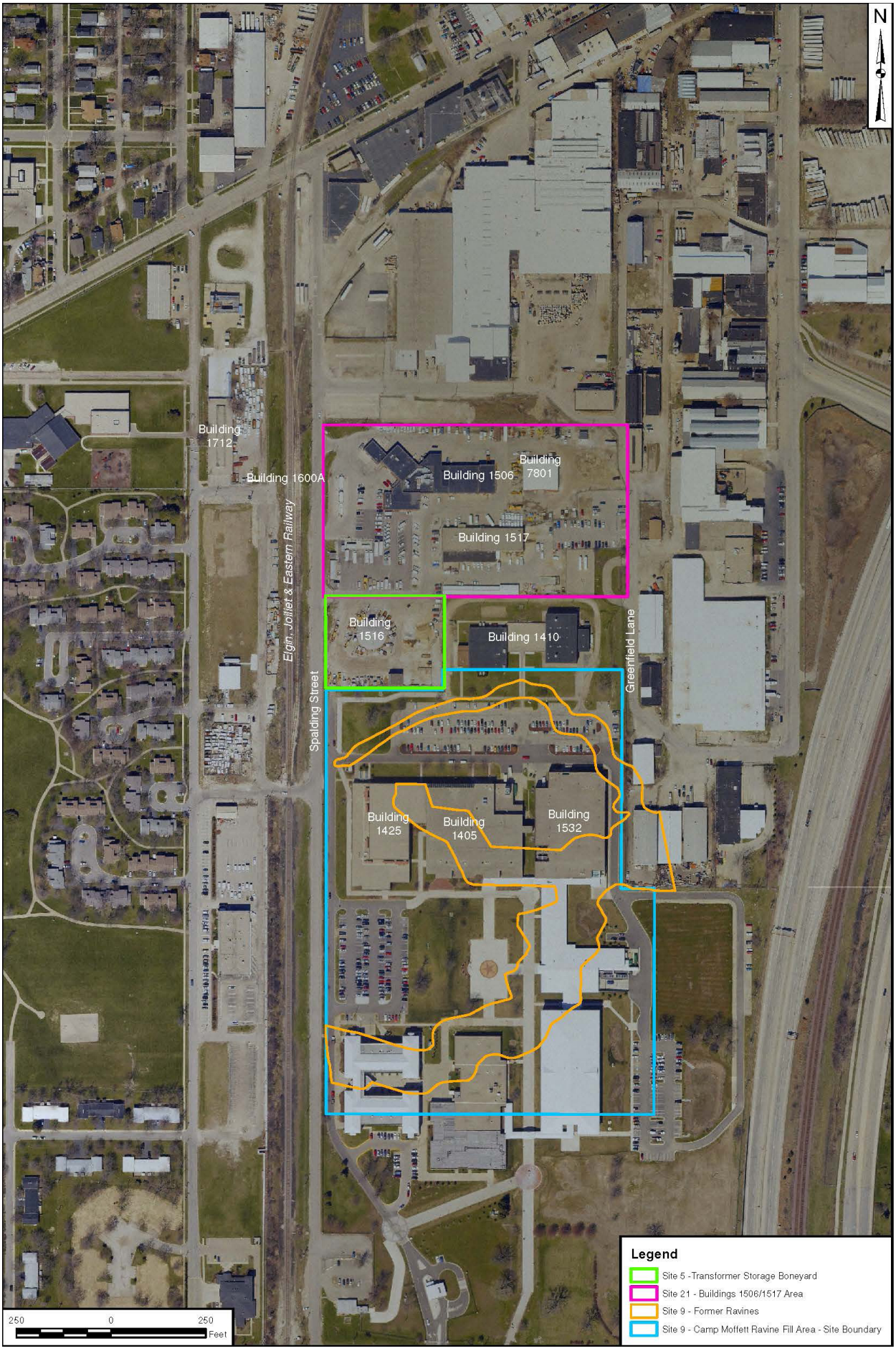


Figure 2: Locations of Site 5, 9, and 21

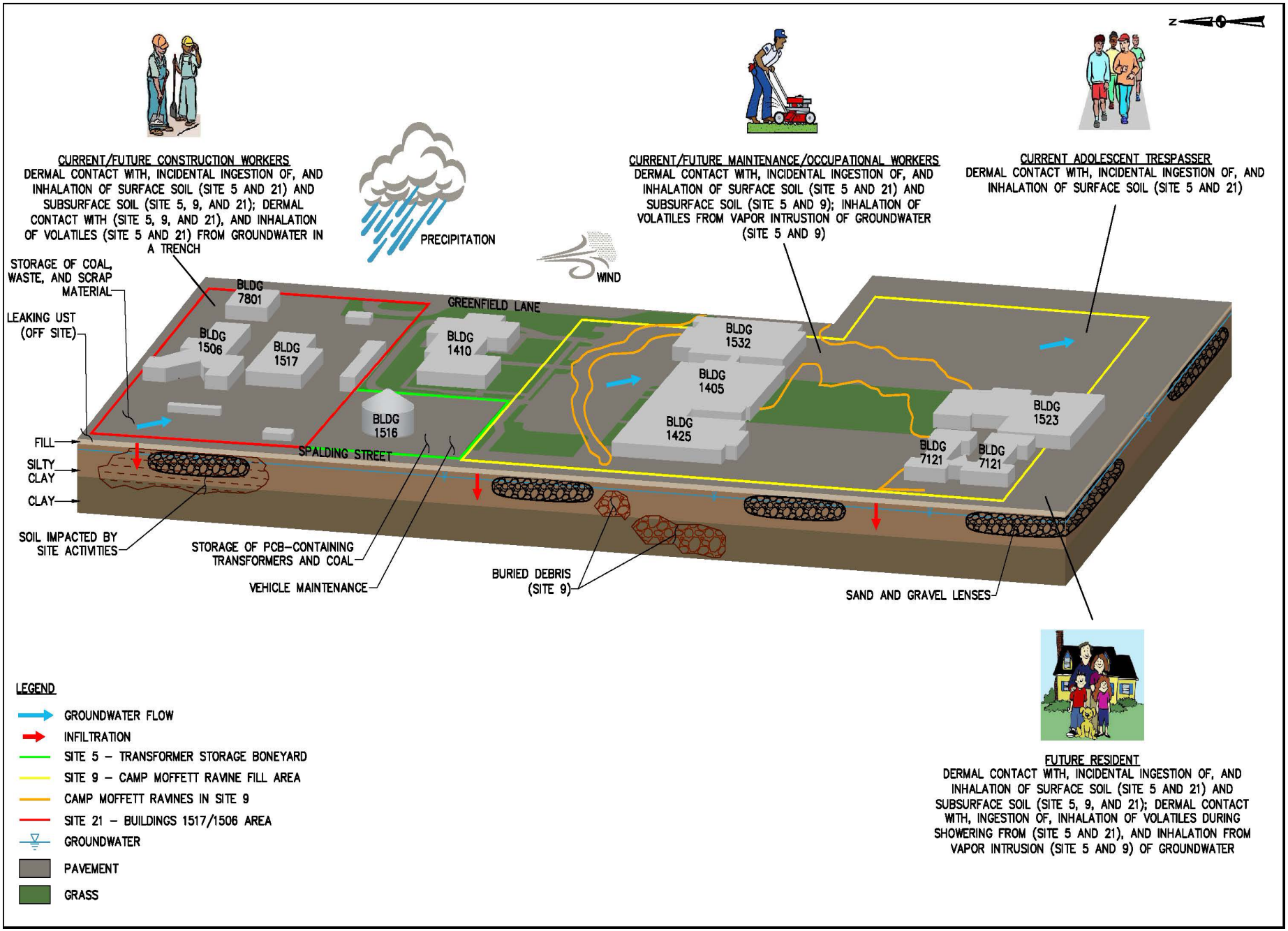


Figure 3: Conceptual Site Model

How are Human Health Risks Evaluated?

A human health risk assessment (HHRA) estimates "baseline risk," which is an estimate of the likelihood of health problems occurring if no cleanup action occurs at a site. To estimate baseline risk at a site, the Navy undertakes a four-step process in accordance with U.S. Environmental Protection Agency (USEPA) guidance:

Step 1: Analyze Contamination

Step 2: Estimate Exposure

Step 3: Assess Potential Health Dangers

Step 4: Characterize Site Risk

In Step 1, the Navy looks at the concentrations of chemicals found at a site as well as past scientific studies on the effects these chemicals have had on people (or animals when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help determine which chemicals are most likely to pose the greatest threats to human health.

In Step 2, the Navy considers the different ways that people might be exposed to the chemicals identified in Step 1, the concentrations to which people might be exposed, and the potential frequency and duration of exposure. Using this information, the Navy develops reasonable maximum exposure (RME) and the central tendency exposure (CTE) scenarios, which represents the highest level and average level of human exposure, respectively, that could reasonably be expected to occur.

In Step 3, the Navy uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. The likelihood of any kind of cancer resulting from exposure to a site is generally expressed as an upper bound probability, for example, a 1 in 10,000 chance ($1x10^{-4}$). In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site chemicals. An extra cancer case means that one more person could get cancer than would normally be expected from other causes. The USEPA target risk range for carcinogenic risks is $1x10^{-4}$ to $1x10^{-6}$. For non-cancer health effects, the Navy calculates a Hazard Index (HI) and below an HI of 1 (threshold level) non-cancer health effects are no longer predicted.

In Step 4, the Navy determines whether site risks are great enough to cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized. The Navy adds the potential risks from the individual chemicals to determine the total risk resulting from the site.

The results of the HHRAs are summarized in the site-specific sections.

sites is primarily limited to military personnel and employees. In addition, adolescent trespassers may be exposed to surface soil at the sites. The evaluation of future use scenarios included these same populations and also included site residents under the unlikely premise that the site would be developed for residential use.

The potential receptors may have direct contact exposure to soil. Hypothetical future residents may also be exposed to groundwater by dermal contact, ingestion, and inhalation (during showering). Occupational/maintenance workers and hypothetical future residents may also be exposed to chemicals that have migrated from groundwater. Construction workers might come into contact with groundwater during excavation activities.

Remedial action is needed when an unacceptable risk of exposure to contaminants exists for potential receptors such as human receptors (discussed on page 2).

The potential risks to human receptors were estimated based on the assumption that no actions would be taken to control contaminant releases or exposure.

Under current and future use scenarios, risks to ecological receptors were not evaluated because exposure of ecological receptors to Sites 5, 9, and 21 is expected to be minimal based on the industrial nature of the sites and lack of suitable habitat due to limited vegetation at the sites.

Why is Remedial Action Needed?

The Navy's environmental studies of Sites 5, 9, and 21 resulted in the conclusion that as a result of past activities, several chemicals are present in surface soil, subsurface soil, and/or groundwater at these sites that may result in unacceptable human health risk. These risks are described further in the site-specific sections later in the document. Tables 1 and 2 summarize chemicals identified as COCs in the FFS for soil and groundwater, respectively.

Preliminary Remediation Goals (PRGs) were developed for each site to identify the concentrations of chemicals that, when exceeded, cause potentially unacceptable risk to human health and the environment. In addition to the chemicals identified in the risk assessments resulting in unacceptable human health risks, chemicals that exceeded Illinois criteria were also considered during the development of PRGs.

What are the Remedial Action Objectives?

Remedial action objectives (RAOs) provide a general description of what the cleanup will accomplish. The RAOs are medium-specific goals that define the objectives of conducting cleanups to protect receptors that are at risk from contaminated media. The RAOs for NSGL Sites 5, 9, and 21 were developed based on the current land use as I/C property and hypothetical future land use as residential property, with the goal of protecting the public from potential current and future health risks. The RAOs were also developed in consideration of the existing prohibitions on groundwater use. RAOs are summarized in the site-specific sections.

Evaluation of Remedial Alternatives

Remedial alternatives for NSGL Sites 5, 9, and 21 were originally presented in the FFS. The alternatives were evaluated according to the criteria described in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (see box on page 7). Estimated costs presented in the FFS include capital and net present worth (NPW) costs. The alternatives for each site are described separately in the site-specific sections.

Site-Specific Information

The following sections include the site description, nature and extent of contamination, human health risks, RAOs, description of remedial alternatives, and the Preferred Alternative for each of the sites.

TABLE 1. COMPARISON OF COC CONCENTRATIONS IN SOIL TO SCREENING CRITERIA

COC	Site 5		Site 9	Site 21		Illinois EPA Background	Illinois EPA TACO Residential Ingestion	Illinois EPA TACO I/C Ingestion	Illinois EPA TACO Construction Worker Ingestion
	Surface Soil (max/avg)	Subsurface Soil (max/avg)	Subsurface Soil (max/avg)	Surface Soil (max/avg)	Subsurface Soil (max/avg)				
Metals (mg/kg)									
Arsenic	12/5.64	16/7.18	115/15.3	48.4/12	85/12.1	13	13	13	61
Cobalt	NA	NA	NA	NA	23.8/8.9	8.9	4,700	120,000	12,000
Iron	66,000/20,379	NA	NA	69,500/26,762	65,800/26,966	15,900	NC	N/C	N/C
Lead	NA	NA	15,000/595	428/101	NA	36	400	800	700
Manganese	940/441	1,800/743	1,090/620	NA	NA	636	1,600	41,000	4,100
Polynuclear Aromatic Hydrocarbons (µg/kg)									
Benzo(a)anthracene	6,100/1,080	22,000/661	490/119	22,000/1,894	32,000/2,140	1,800(1)	900	8,000	170,000
Benzo(a)pyrene	12,000/1,655	18,000/618	540/173	38,000/3,334	27,000/2,702	2,100(1)	90	800	17,000
Benzo(b)fluoranthene	14,000/2,198	22,000/813	1,100/261	59,000/4,383	41,000/3,090	2,100(1)	900	8,000	170,000
Benzo(k)fluoranthene	5,800/874	11,000/363	NA	21,000/1,736	14,000/1,136	1,700(1)	9,000	78,000	1,700,000
Chrysene	NA	NA	NA	31,000/2,491	34,000/2,091	2,700(1)	88,000	780,000	17,000,000
Dibenzo(a,h)anthracene	2,300/393	3,700/131	240/39.1	1,100/326	3,300/441	420(1)	90	800	17,000
Indeno(1,2,3-cd)pyrene	9,700/1,323	12,000/418	660/149	36,000/3,039	16,000/1,707	1,600(1)	900	8,000	170,000

1 – Applies to surface soil only.
Avg – Average
COC – Chemical of Concern
I/C – Industrial/Commercial
Max – Maximum
mg/kg – Milligram per kilogram
NA – Not applicable; Not a COC
NC – No criterion
µg/kg – Microgram per kilogram
TACO – Tiered Approach to Corrective Action Objectives

TABLE 2. COMPARISON OF COC CONCENTRATIONS IN GROUNDWATER TO SCREENING CRITERIA

COC (µg/L)	Site	Frequency of Detection	Groundwater Concentration (Maximum/Average)	Federal MCL	Illinois EPA Class I TACO	Illinois EPA Class II TACO	Illinois EPA Class I GW Standard	Illinois EPA Class II GW Standard
Barium	5	6/6	8,100/1,400	2,000	2,000	2,000	2,000	2,000
Carbon tetrachloride	5	1/5	170/170	5	5	25	5	25
Arsenic	9	7/8	13/3.3	10	50	200	10(1)	200
PCP	21	1/6	7.8/7.8	1	1	5	1	5

1 - Illinois EPA Class I Groundwater Standard takes precedence over the Illinois EPA Class I TACO standard.
GW – Groundwater
MCL – Maximum Contaminant Level
PCP – Pentachlorophenol
µg/L – Microgram per liter
TACO – Tiered Approach to Corrective Action Objectives

Evaluation Criteria for Superfund Remedial Alternatives

Threshold Criteria:

1. Overall Protection of Human Health and the Environment: Will it protect you and the plant and animal life on and near the site? The Navy will not choose a plan that does not meet this basic criterion.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs): Does the alternative meet all federal environmental, state environmental, and facility siting statutes, regulations and requirements? ARARs were determined and presented in the FFS. The chosen cleanup plan must meet this criterion.

Primary Balancing Criteria:

3. Long-Term Effectiveness and Permanence: Will the effects of the cleanup plan last or could contamination cause future risk?
4. Reduction of Toxicity, Mobility or Volume through Treatment: Using treatment, does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. Short-Term Effectiveness: How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents, or the environment?
6. Implementability: Is the alternative technically feasible? Are the right goods and services (e.g., treatment machinery) available for the plan?
7. Cost: What is the total cost of an alternative over time? The Navy must find a plan that gives necessary protection for a reasonable cost.

Modifying Criteria:

8. State Acceptance: Does the state agree with the proposal?
9. Community Acceptance: What objections, suggestions, or modifications do the public offer during the comment period?

Proposed Plan for Site 5 – Transformer Storage Boneyard

Background and Characteristics

Site 5 is located in an industrial area that consists largely of buildings and parking lots and has very little vegetation. The site covers approximately 2 acres and is a flat area that is partially paved and graveled. From 1945 to 1985, Site 5 was used primarily as a storage area for out-of-service transformers, including some that contained polychlorinated biphenyl (PCB) oils. Lead-insulated cable, heavy equipment, and other miscellaneous scrap metal and materials were also stored at the site. Currently, the site contains a road salt storage dome, sand and gravel stockpiles, and equipment and vehicles for road maintenance (Figure 4).

The investigations conducted at Site 5 are summarized in Table 3. The Initial Assessment Study (IAS) documented that waste materials in the Transformer Storage Boneyard included transformer oils, PCB transformer oils, and lead insulation from high-voltage cables. A Verification Study (VS), completed in 1991, indicated the presence of oil and grease and the PCB Aroclor-1260 and elevated concentrations of lead in soil. The presence of oil and grease was presumably due to leaks from stored vehicles, vehicle maintenance activities, and transformer storage. Aroclor-1260 detections in soil may have been from storage of PCB oil-laden transformers. Lead concentrations were greater than regional background concentrations, and the source of lead at the site is likely related to the storage of lead-insulated cable.

It was also reported that dumpsters from NSGL had been cleaned and painted in the area in the past. The CSM identifying contaminant sources, contaminant release mechanisms, transport routes, and receptors as discussed previously is presented on Figure 3.

Nature and Extent of Contamination

The Navy conducted a RI through two phases in 2010 and 2012. Surface soil, subsurface soil, and groundwater samples

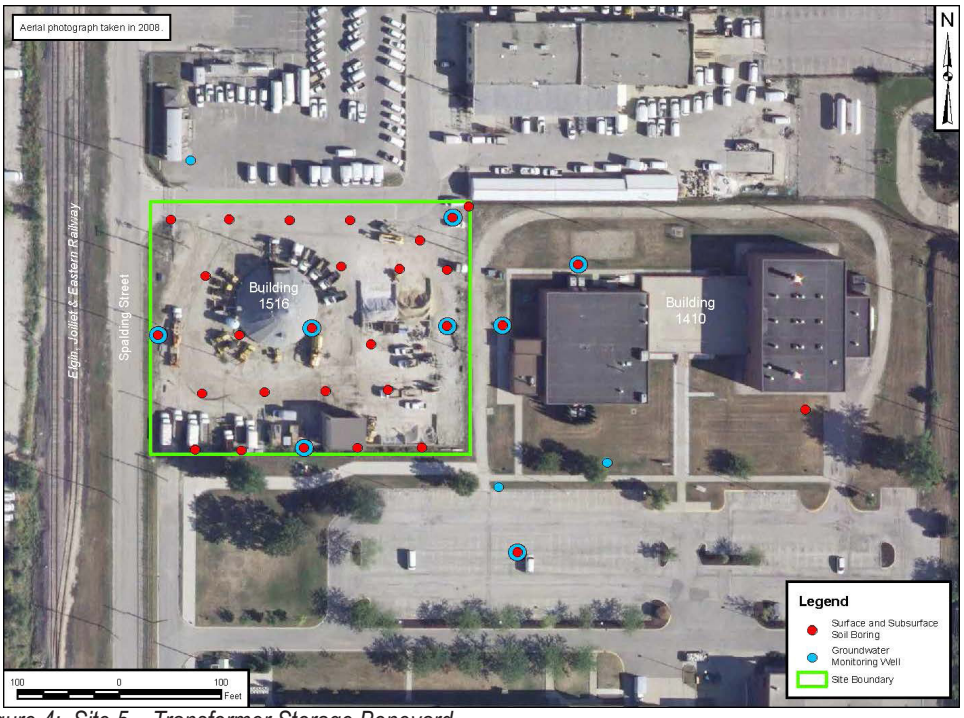


Figure 4: Site 5 – Transformer Storage Boneyard

Table 3. Previous Investigations and Site Documentation For Site 5		
Investigation	**Date**	**Activities**
IAS	1986	Included review of historical records and aerial photographs, field inspections, and personnel interviews to evaluate the potential for environmental impacts at numerous sites across the base. Site 5 was identified as an area where further investigation was recommended to confirm or refute the presence of suspected contamination.
VS	1991	Indicated the presence of oil and grease and Aroclor-1260 and elevated concentrations of lead in soil at Site 5.
RI	2013	Field investigations conducted in 2010 and 2012. PAH and metals concentrations in soil and VOC and metals concentrations in groundwater exceeded Illinois EPA TACO criteria. A risk assessment was performed using data from the Site 5 RI.

were collected and analyzed for the potential presence of VOCs, semivolatile organic compounds (SVOCs), PCBs, and metals. The results of the chemical analyses were used to identify the type and extent of chemicals in soil and groundwater. The locations of collected samples are shown on Figure 4.

Concentrations of PAHs, iron, and manganese in surface soil and benzene, PAHs, manganese, and mercury in subsurface soil exceeded Illinois EPA TACO. Concentrations of arsenic in subsurface soil exceeded an Illinois EPA background value. Concentrations of chloroform, carbon tetrachloride, barium, iron, and manganese in groundwater exceeded Illinois EPA TACO criteria; however, only carbon tetrachloride and barium exceeded their respective maximum contaminant levels (MCLs). Concentrations of other parameters, such as Aroclor-1260 and lead noted for elevated concentrations in the VS, were less than the Illinois EPA TACO criteria. Based on consideration of Illinois criteria exceedances as well as unacceptable human health risks, PAHs, arsenic, iron (surface soil only), and manganese in soil and carbon tetrachloride and barium in groundwater were selected as COCs.

The majority of PAH concentrations in soil exceeding criteria were beneath pavement or immediately adjacent to paved areas. Metals concentrations in soil were generally greatest to the northwest and southwest corners of the site. VOCs in groundwater were detected to the northeast of the site near maintenance shops. Barium was detected in groundwater near Building 1516, which stored road salt.

Summary of Risks

The Site 5 RI included evaluating potential human health risk using detected chemical concentrations in surface soil, subsurface soil, and groundwater. Potential receptors including construction workers, maintenance/occupational workers, trespassers, and hypothetical residents were evaluated in the risk assessment because they may come into direct contact with surface and/or subsurface soil. Construction workers might also encounter groundwater during excavation activities. Hypothetical residents could be exposed to groundwater by dermal contact, ingestion, and inhalation. Hypothetical residents and maintenance/occupational workers could be exposed to chemicals that migrated from groundwater by vapor intrustion.

The site is covered by pavement and a storage structure; therefore, current occupational or maintenance workers are not exposed to soil at the site.

Non-cancer Hazard Index (HI) exceeded the target HI of 1 for iron in surface soil and manganese in subsurface soil and cancer risk exceeded $1x10^{-4}$ for PAHs and arsenic in surface and subsurface soil for hypothetical future residents.

If hypothetical domestic use of groundwater for drinking and showering is taken into consideration, cancer risks are greater than $1x10^{-4}$ for carbon tetrachloride and noncancer HIs are greater than 1 for barium for hypothetical future residents. In addition, carbon tetrachloride and barium concentrations exceeded Illinois EPA criteria.

Although risks to I/C and construction workers were within the USEPA risk range (10^{-6} to 10^{-4}) in the human health risk assessment (HHRA), several samples had concentrations of several PAHs that were greater than TACO criteria for I/C and construction workers exposure. PAH concentrations were greater than I/C TACO criteria in both surface and subsurface soil. PAH concentrations were greater than construction worker exposure criteria in subsurface soil only. Under current conditions exposure of I/C and construction workers to contaminated soil is prevented by the parking lots and the building at Site 5.

It is the lead Agency's current judgment that the Preferred Alternative identified in this Proposal Plan, or one of the other active measures considered in the Proposal Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Remedial Action Objectives

The following RAOs were developed for Site 5:

RAO 1: Prevent residential exposure through ingestion, dust inhalation, and dermal contact with contaminated surface and subsurface soil with COC concentrations exceeding PRGs shown in Table 4.

RAO 2: Prevent I/C and construction worker exposure through ingestion, dust inhalation, and dermal contact to contaminated surface soil with COC concentrations exceeding TACO criteria.

RAO 3: Return the groundwater resource to beneficial use, if practicable, and address human health risks associated with consumption of groundwater with COC concentrations exceeding PRGs shown in Table 5.

Remedial Action Alternatives

The FFS presents the options that the Navy developed for remedial action at the site to address the estimated 4,000 cy of contaminated soil. Based on the evaluation of various technologies documented in the FFS, the five remedial alternatives described below were developed and evaluated for Site 5 (see box on page 7 for evaluation criteria).

TABLE 4
Site 5 Surface and Subsurface Soil PRGs

COC	Surface Soil		Subsurface Soil	
	PRG	Basis	PRG	Basis
Residential Exposure				
Metals (mg/kg)				
Arsenic	13	Illinois EPA TACO	13	Illinois EPA TACO
Iron	55,000	HHRA	-	-
Manganese	1,600	HHRA	1,600	HHRA
Polynuclear Aromatic Hydrocarbons (µg/kg)				
Benzo(a)anthracene	1,800	Background	1,500	HHRA
Benzo(a)pyrene	2,100	Background	150	HHRA
Benzo(b)fluoranthene	2,100	Background	1,500	HHRA
Benzo(k)fluoranthene	9,000	Illinois EPA TACO	15,000	HHRA
Dibenzo(a,h)anthracene	420	Background	150	HHRA
Indeno(1,2,3-cd)pyrene	1,600	Background	1,500	HHRA

COC – Chemical of Concern
HHRA – Human Health Risk Assessment
Illinois EPA – Illinois Environmental Protection Agency
PRG – Preliminary Remediation Goal
TACO – Tiered Approach to Corrective Action Objectives

TABLE 5
Site 5 Groundwater PRGs

COC	Selected PRG (µg/L)	Rationale
Carbon Tetrachloride	5	Illinois EPA Class I GW Standard
Barium	2,000	Illinois EPA Class I GW Standard

GW – Groundwater
Illinois EPA – Illinois Environmental Protection Agency
PRG – Preliminary Remediation Goal

Alternative 5-1: No Action

This alternative is a "walk-away" alternative that maintains the site as is and is required for consideration under CERCLA to establish a basis for comparison with other alternatives. No restriction would be imposed to prevent access to the site, and the alternative would not address the site contamination. Under this alternative, the property would be released for unrestricted use. In addition, Five-Year Reviews would not be required.

Alternative 5-2: LUCs and Barrier

LUCs would be established at the site to make sure that the property is not developed for residential or non-residential special uses (such as for a park, day care, or school). LUCs would require review of construction activities and intrusive work in the area to protect workers and to confirm proper management of contaminated media prior to construction activities. A LUC Remedial Design (RD) would be prepared to establish methods to prevent exposure to COCs and to restrict the disturbance of contaminated soil. The LUC RD would be developed after the signing of the ROD to document the LUC requirements.

LUCs would also be implemented to prevent groundwater use. LUCs would be maintained in the event of a change in land use or ownership.

Under this alternative, the existing pavement and building would be used as a barrier to prevent exposure by I/C workers to soil contaminants exceeding I/C TACO criteria. Most of the site is covered by a combination of asphalt pavement, concrete, and building foundations. The barriers would be required to remain intact.

Five-Year Reviews to evaluate the continued protectiveness of the remedy would be required for this alternative because contamination would remain in soil and groundwater in excess of concentrations that allow for unrestricted use and unlimited exposure.

Alternative 5-2A: LUCs, Barrier, and ISCO

Alternative 5-2A includes components similar to Alternative 5-2, with the addition of in-situ chemical oxidation (ISCO) treatment of groundwater and groundwater monitoring. Similar to Alternative 5-2, LUCs would be implemented to restrict groundwater use. For this alternative, groundwater LUCs would only continue until ISCO is completed and the groundwater PRGs are met. As for Alternative 5-2, soil LUCs would be maintained in the event of a change in land use or ownership.

To assess the performance of ISCO, groundwater monitoring would be performed to track changes in COC concentrations. Groundwater monitoring would continue until ISCO is completed and groundwater PRGs are met.

Five-Year Reviews would be required for soil because concentrations of contaminants will remain in soil in excess of concentrations acceptable for unrestricted use and unlimited exposure at the site. Groundwater would be subject to Five-Year Reviews until PRGs are met.

Alternative 5-3: Excavation (Unrestricted Reuse), Off Site Disposal of Soil, and Groundwater LUCs

Alternative 5-3 would consist of excavation of approximately 4,000 cubic yards (cy) of contaminated soil to meet PRGs for residential exposure. Excavated material would be transported off site to a non-hazardous landfill for disposal.

LUCs would be implemented to restrict groundwater use.

Five-Year Reviews would be required for groundwater. However, Five-Year Reviews would not be required for soil because concentrations of contaminants in soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Alternative 5-3A: Excavation (Unrestricted Reuse), Off Site Disposal of Soil, Groundwater LUCs, and ISCO

Alternative 5-3A includes similar components to Alternative 5-3 with the addition of ISCO treatment of groundwater. Groundwater monitoring would be conducted to track changes in COC concentrations in order to assess the performance of ISCO. For this alternative, LUCs would only continue until ISCO is completed and the groundwater PRGs are met.

Five-Year Reviews would be required for groundwater until PRGs are met. However, Five-Year Reviews would not be required for soil because concentrations of contaminants in soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Analysis of Alternatives

In accordance with CERCLA, a detailed analysis of the alternatives must be conducted with respect to the nine CERCLA evaluation criteria. These include the two threshold, five balancing, and two modifying criteria described in the box on page 7. An analysis of these criteria was performed for each remedial alternative, and summary comparisons of these analyses are presented in Table 6. Consult the Sites 5, 9, and 21 FFS Report for more detailed information.

Preferred Alternative

Alternative 5-2 is the Preferred Alternative for Site 5. Figure 5 shows the extent of the area covered by the existing barrier and LUCs for this Preferred Alternative. Based on information currently available, the Navy believes that the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with Applicable or Relevant and Appropriate Requirements (ARARs); (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent possible. However, the Preferred Alternative does not satisfy the preference for treatment as a principal element.

Why Does the Navy Recommend this Preferred Alternative?

The Preferred Alternative for Site 5, Alternative 5-2, is recommended because it would meet the RAOs for the following reasons:

- This alternative would effectively prevent exposure to surface and subsurface soil and groundwater contamination by maintaining the existing barrier and controlling use of and activities at the property.
- It would protect human health and the environment.
- LUCs at the sites can be incorporated into the Naval Station Great Lakes Base Master Plan and are not overly burdensome.
- Five-Year Reviews would be conducted to make sure the barrier and LUCs are in place and maintained for continued protection of human health and the environment.
- It is deemed to be cost effective and represents a reasonable value for the money to be spent.
- Land use is not expected to change in the foreseeable future.

This recommended alternative can change in response to public comments or based on receipt of new information.

TABLE 6

SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES – SITE 5

EVALUATION CRITERION	ALTERNATIVE 5-1: NO ACTION	ALTERNATIVE 5-2: LUCs and Barrier	ALTERNATIVE 5-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 5-3: Excavation (Unrestricted Re-use), Off-site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 5-3A: Excavation (Unrestricted Re-use), Off-site Disposal of Soil, Groundwater LUCs, and ISCO
Overall Protection of Human Health and Environment	Would not be protective. The potential for exposure of human receptors to contaminated soil would remain unchanged. Groundwater use restrictions would remain, but could be lifted.	Would be protective of human health by minimizing exposure to contaminated soil and groundwater.	Would be protective of human health by minimizing exposure to contaminated soil and treating COCs in groundwater	Would be protective of human health by removing contaminated soil from the site and by using LUCs to restrict the use of groundwater.	Would be protective of human health by removing contaminated soil from the site and by treating COCs in groundwater.
Compliance with ARARs and TBCs: • Chemical-Specific • Location-Specific • Action-Specific	• Would not comply • Not applicable • Not applicable	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply
Long-Term Effectiveness and Permanence	Would be neither effective nor permanent.	Would provide long-term effectiveness and permanence. Would be least effective because LUCs must be continually enforced to prevent exposure.	Would provide long-term effectiveness and permanence. Would be more effective than Alternative 5-2 because groundwater COCs are treated, but LUCs must be continually enforced to prevent exposure to soil contaminants.	Would provide long-term effectiveness and permanence. More effective than Alternatives 5-2 and 5-2A because soil contaminants would be removed from the site.	Would provide long-term effectiveness and permanence. Would be most effective because soil contaminants would be removed from the site and groundwater COCs would be treated.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	None. There would be no treatment.	None. There would be no treatment.	There would be treatment of groundwater COCs.	None. There would be no treatment.	There would be treatment of groundwater COCs.

EVALUATION CRITERION	ALTERNATIVE 5-1: NO ACTION	ALTERNATIVE 5-2: LUCs and Barrier	ALTERNATIVE 5-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 5-3: Excavation (Unrestricted Re-use), Off-site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 5-3A: Excavation (Unrestricted Re-use), Off-site Disposal of Soil, Groundwater LUCs, and ISCO
Short-Term Effectiveness	Would not result in risks to remediation workers or result in short-term adverse impacts to local community or the environment. Would not achieve RAOs or PRGs.	Would not result in risks to remediation workers or result in short-term adverse impacts to the local community or the environment. The LUC RD would be implemented in approximately 3 months and would achieve RAOs after implementation.	Slight increase in risks to remediation workers from ISCO would be controlled by personal protective equipment (PPE) and safety procedures. Potential short-term adverse impacts to the local community and the environment during oxidant transport. LUC RD would be implemented in approximately 3 months and would achieve RAOs after implementation. ISCO would be completed within 2 years.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impacts to the community from truck traffic. Action would be completed in 2 months. RAOs 1 and 2 would be met after completion of excavation, and RAO 3 would be met upon implementation of LUCs.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impact to community from truck traffic and oxidant transport. Action would be completed in 2 months. RAOs 1 and 2 would be met after completion of excavation, RAO 3 would be met upon implementation of ISCO. ISCO would be completed within 2 years.
Implementability	Nothing to implement.	Would be easiest to implement.	Would be easier to implement than Alternatives 5-3 and 5-3A.	Would be less difficult to implement than Alternative 5-3A.	Would be most difficult to implement.
Costs: Capital NPW of Annual Costs NPW	 $0 $0 $0	 $21,000 $345,000 (30-Year) $366,000 (30-Year)	 $378,000 $345,000 (30-Year) $723,000 (30-Year)	 $1,301,000 $191,000 (30-Year) $1,492,000 (30-Year)	 $1,637,000 $192,000 (30-Year) $1,829,000 (30-Year)
State Acceptance	Assessment will be performed after comments on the Proposed Plan are received from Illinois EPA.				
Community Acceptance	Assessment will be performed after comments on the Proposed Plan are received from the public.				

Shading indicates preferred alternative.
Illinois EPA - Illinois Environmental Protection Agency
ISCO - In-situ Chemical Oxidation
LUC - Land Use Control
NPW - Net Present Worth
PPE - Personal Protective Equipment
PRG - Preliminary Remediation Goal
RAO - Remedial Action Objective
RD - Remedial Design
TBC - To Be Considered

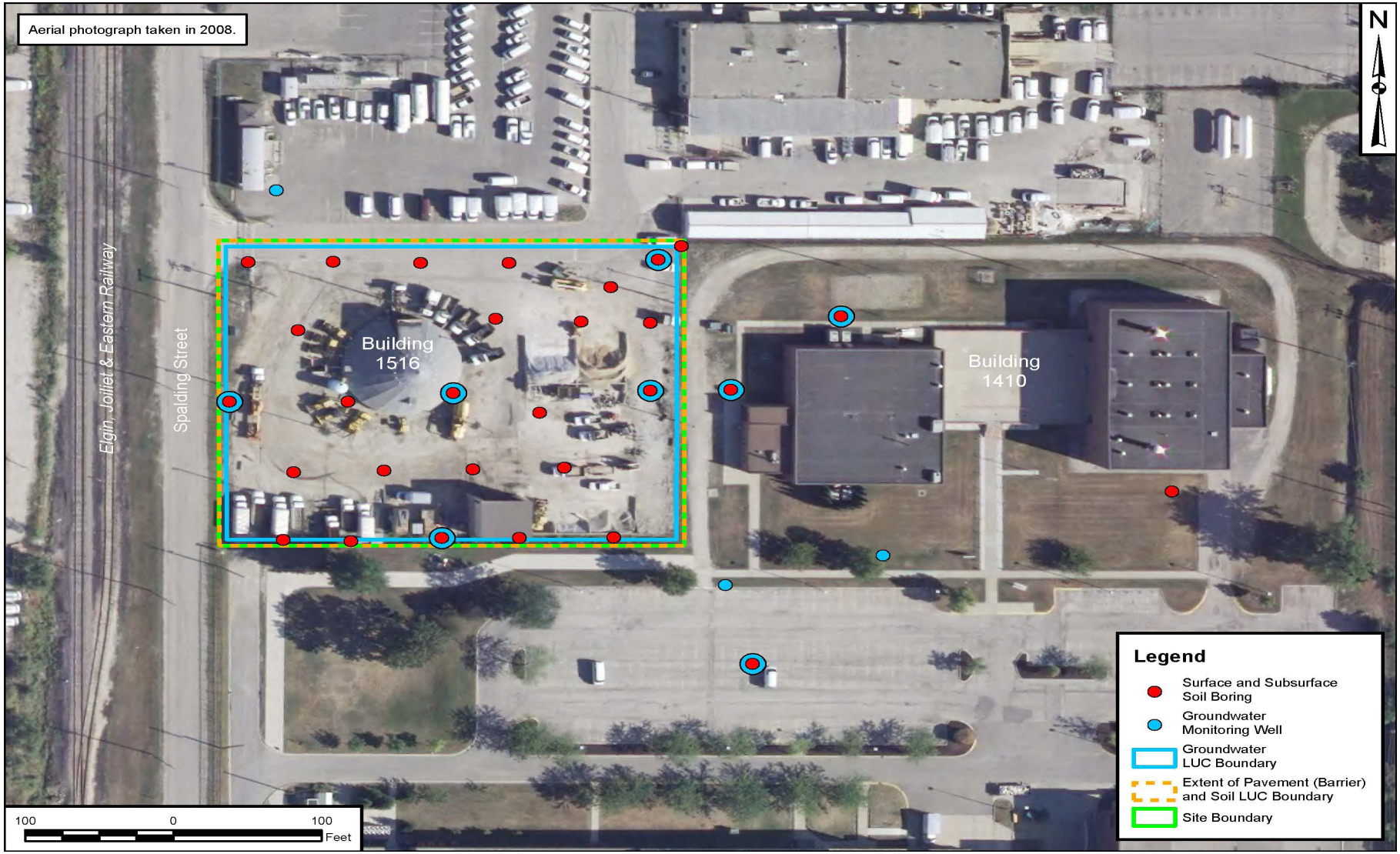


Figure 5: Site 5 - Barrier and Land Use Control Boundaries for the Preferred Alternative

Proposed Plan for Site 9 – Camp Moffett Ravine Fill Area

Background and Characteristics

Site 9 is located in the area of three former ravines that were filled and are currently overlain by buildings and parking lots (Figure 6). The area of the former ravines was approximately 1.5 acres. The ravines were likely filled to create usable property during the construction and development of Camp Moffett during World War II. The site was identified as a disposal area based on the findings of the IAS. The fill material is predominantly soil and there is no information to suggest that hazardous waste disposal occurred at Site 9. During excavation activities, materials associated with building construction, galley-type wastes (e.g., stainless steel serving trays and food wastes), and non-hazardous material/debris (e.g., stained soil, slag, brick, and ash) were encountered. The investigations conducted at Site 9 are summarized in Table 7.

Galley-type wastes were uncovered at Site 9 during a 1980 excavation to repair a portion of the roadway in Camp Moffett that had collapsed. The excavation went to the limit of reach of the backhoe (approximately 8 feet below the surface) and did not reach the bottom of the fill. No effort was made to determine the lateral extent of the fill; however examination of older aerial photographs and topographic maps of the area suggests that the area was once a narrow V-shaped ravine and a former tributary of Pettibone Creek. Additional excavation activities associated with building construction in 2003 and 2005/2006 encountered galley-type wastes and non-hazardous material/debris including cinders, cobbles, concrete, glass, and brick. The CSM identifying contaminant sources, contaminant release mechanisms, transport routes, and receptors as discussed previously is presented in Figure 3.

Nature and Extent of Contamination

The Navy conducted a RI in 2009 to determine the nature and extent of subsurface fill materials that were placed in the former ravines, and to identify potential risks associated with Site 9. The investigation included the collection of subsurface soil and groundwater samples, which were analyzed for VOCs, SVOCs, PCBs, pesticides, dioxins/furans, and metals. The locations of collected samples are shown on Figure 6. Concentrations of tetrachloroethene (VOC), PAHs, alpha-BHC (pesticide), and several metals in subsurface soil exceeded Illinois EPA TACO criteria for unrstricted property use. Concentrations of chloroform, iron, lead, and manganese in groundwater exceeded Illinois EPA TACO criteria. Concentrations of arsenic in groundwater exceeded its MCL. Concentrations of other parameters were less than the Illinois EPA TACO criteria. Based on consideration of Illinois criteria exceedances as well as unacceptable human health risks, PAHs, arsenic, lead, manganese in subsurface soil and arsenic and lead in groundwater were selected as COCs.

The chemical concentrations that exceeded criteria were generally located near where the three fingers of the ravine merge. Fill material, including ash and slag which may be from a former foundry east of the site, may have contributed to the presence of COCs at the site. Other site activities and general fill material may have also conributed to the presence of COCs. No information has been identified to indicate the presence of listed hazardous waste or characteristically hazardous waste at the site.

Summary of Risks

The RI at Site 9 included evaluating potential human health risk using detected chemical concentrations in subsurface soil and groundwater. Potential receptors including construction workers, maintenance/occupational workers, and hypothetical residents were evaluated in the risk assessment because they may come into direct contact with subsurface soil. Construction workers might also encounter groundwater during excavation activities. Hypothetical residents could be exposed to groundwater by dermal contact and ingestion. Hypothetical residents and maintenance/occupational workers could be exposed to chemicals that migrated from groundwater by vapor intrusion.

Current occupational/maintenance workers are not exposed to subsurface soil and would only be exposed to subsurface soil if excavation occurred at the site.

Non-cancer HI exceeded the target HI of 1 for arsenic in subsurface soil and cancer risk exceeded $1x10^{-4}$ for PAHs and arsenic in subsurface soil for hypothetical future residents.

If hypothetical domestic use of groundwater for drinking and showering is taken into consideration, cancer risks are greater than $1x10^{-4}$ and noncancer HIs are greater than 1 for arsenic for hypothetical future residents. In addition, arsenic concentrations exceeded its Illinois EPA criterion.

Although risks to I/C and construction workers were within the USEPA risk range (10^{-6} to 10^{-4}) in the HHRA, several samples had concentrations of lead and arsenic that were greater than TACO criteria for I/C and construction workers exposure. Concentrations greater than the I/C TACO criterion for lead were detected in subsurface soil. Concentrations greater than construction worker exposure criteria for lead and arsenic were detected in subsurface soil. Under current conditions exposure of I/C and construction workers to contaminated soil is prevented by the soil cover, parking lots, and buildings at Site 9.

Table 7. Previous Investigations and Site Documentation For Site 9

Investigation	Date	Activities
IAS	1986	Included review of historical records and aerial photographs, field inspections, and personnel interviews to evaluate the potential for environmental impacts at numerous sites across the base. Site 9 was identified as an area where further investigation was recommended to confirm or refute the presence of suspected contamination.
RI	2013	Field investigation conducted in 2009 to determine nature and extent of fill materials in former ravines. Concentrations of PAHs, lead, and mercury in subsurface soil and chloroform, iron, lead, and manganese in groundwater exceeded Illinois EPA TACO criteria. A risk assessment was performed using data from the Site 9 RI.

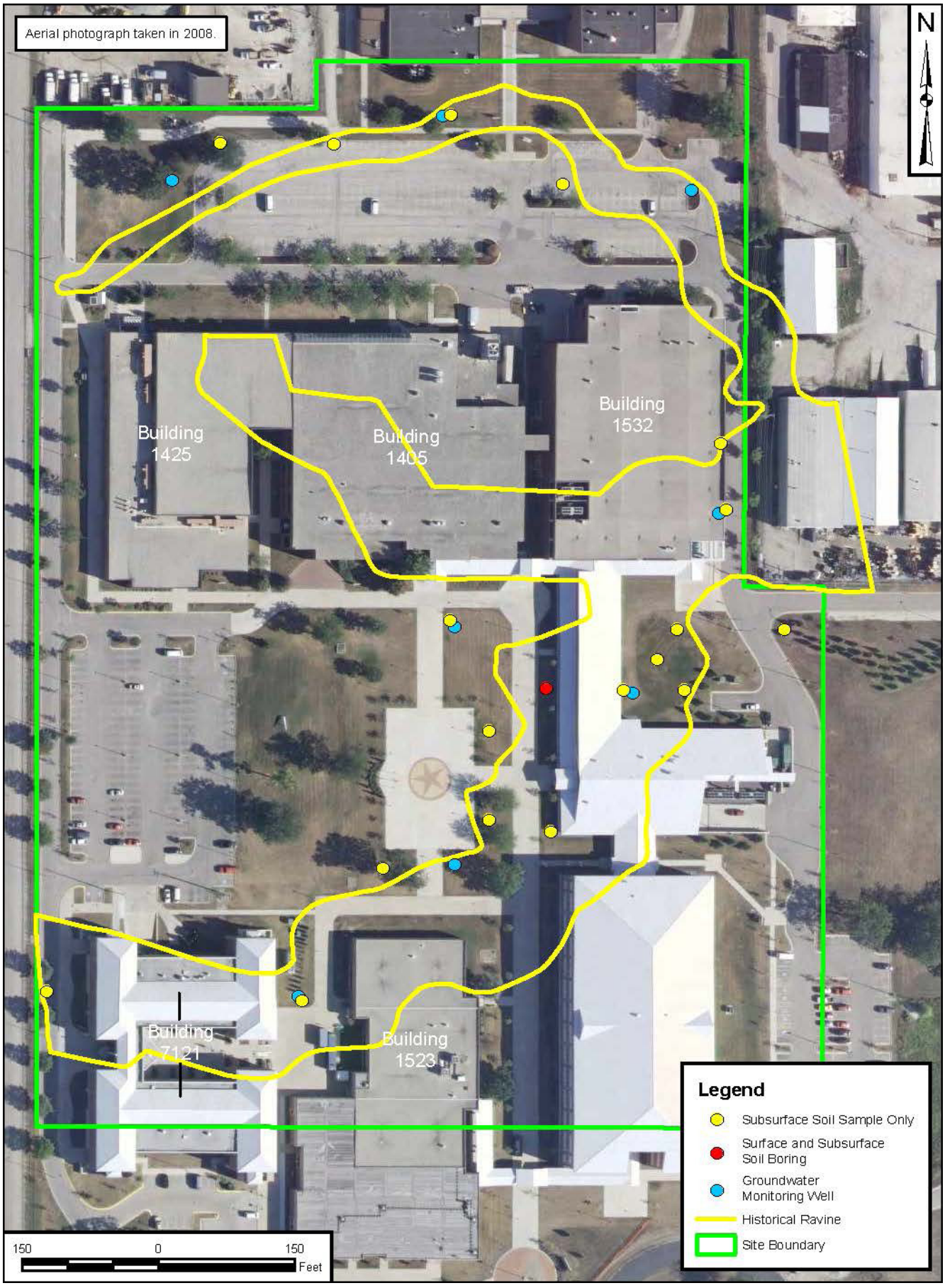


Figure 6: Site 9 - Camp Moffett Ravine Fill Area

It is the lead Agency's current judgment that the Preferred Alternative identified in this Proposal Plan, or one of the other active measures considered in the Proposal Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Remedial Action Objectives

The following RAOs were developed for Site 9:

RAO 1: Prevent residential exposure through ingestion, dust inhalation, and dermal contact with subsurface soil with COC concentrations exceeding PRGs shown in Table 8.

RAO 2: Prevent I/C and construction worker exposure through ingestion, dust inhalation, and dermal contact with contaminated subsurface soil with COC concentrations exceeding TACO criteria.

RAO 3: Return the groundwater resource to beneficial use, if practicable, and address human health risks associated with consumption of groundwater with COC concentrations exceeding PRGs shown in Table 9.

TABLE 8
Site 9 Surface and Subsurface Soil PRGs

COC	Subsurface Soil	
	PRG	Basis
Residential Exposure		
Metals (mg/kg)		
Arsenic	13	Illinois EPA TACO
Lead	400	Illinois EPA TACO
Manganese	1,600	Illinois EPA TACO
Polynuclear Aromatic Hydrocarbons (µg/kg)		
Benzo(a)anthracene	1,500	HHRA
Benzo(a)pyrene	150	HHRA
Benzo(b)fluoranthene	1,500	HHRA
Dibenzo(a,h)anthracene	150	HHRA
Indeno(1,2,3-cd)pyrene	1,500	HHRA

COC – Chemical of Concern
HHRA – Human Health Risk Assessment
Illinois EPA – Illinois Environmental Protection Agency
PRG – Preliminary Remediation Goal
TACO – Tiered Approach to Corrective Action Objectives

TABLE 9
Site 9 Groundwater PRGs

COC	Selected PRG (µg/L)	Rationale
Arsenic	10	Illinois EPA Class I GW Standard
Lead	7.5	Illinois EPA Class I GW Standard

GW – Groundwater
Illinois EPA – Illinois Environmental Protection Agency
PRG – Preliminary Remediation Goal

Remedial Action Alternatives

The FFS presents the options that the Navy developed for remedial action at Site 9 to address the estimated 10,000 cy of contaminated soil. Based on the evaluation of various technologies documented in the FFS, the five remedial alternatives discussed below were developed and evaluated for Site 9 (see box on page 7 for evaluation criteria).

Alternative 9-1: No Action

This alternative is a "walk-away" alternative that maintains the site as is and is required for consideration under CERCLA to establish a basis for comparison with other alternatives. No restrictions would be imposed to prevent access to the site, and the alternative does not address the site contamination. Under this alternative, the property would be released for unrestricted use. In addition, Five-Year Reviews would not be required.

Alternative 9-2: LUCs and Barriers

LUCs would be established at the site to make sure that the property is not developed for residential or non-residential special uses (such as for a park, day care, or school). LUCs would require review of construction activities and intrusive work in the area to protect workers and confirm proper management of contaminated media prior to construction activities. A LUC RD would be prepared to establish methods to prevent exposure to COCs and to restrict the disturbance of contaminated soil. A LUC RD would be developed after the signing of the ROD to document the LUC requirements.

LUCs would also be implemented to prevent groundwater use. LUCs would be permanent in the event of a change in land use or ownership.

The existing pavement, buildings, and maintained grass open areas would be used as barriers to prevent the exposure by I/C workers to subsurface soil contaminants exceeding I/C TACO criteria. The site is covered by a combination of asphalt pavement, concrete, and building foundations. The barriers would be required to remain intact.

Five-Year Reviews to evaluate the continued protectiveness of the remedy would be required for this alternative because contamination would remain in soil and groundwater in excess of concentrations that allow for unrestricted use and unlimited exposure.

Alternative 9-2A: LUCs, Barriers, and ISCO

Alternative 9-2A includes similar components to Alternative 9-2, with the addition of ISCO treatment of groundwater and groundwater monitoring. Similar to Alternative 9-2, LUCs would be implemented to restrict groundwater use. For this alternative, LUCs would only continue until ISCO is completed and the groundwater PRGs are met.

To assess the performance of ISCO, groundwater monitoring would be performed to track changes in COC concentrations. Groundwater monitoring would continue until ISCO is complete and groundwater PRGs are met.

Five-Year Reviews would be required for subsurface soil because concentrations of contaminants would remain in subsurface soil in excess of concentrations acceptable for unrestricted use and unlimited exposure at the site. Groundwater would be subject to Five-Year Reviews until PRGs are met. As for Alternative 9-2, soil LUCs would be maintained in the event of a change in land use or ownership.

Alternative 9-3: Excavation (Unrestricted Reuse), Off Site Disposal of Soil, and Groundwater LUCs

Alternative 9-3 would consist of excavation of approximately 10,000 cy of contaminated subsurface soil to meet PRGs for residential exposure. However, there is uncertainty about this volume because the extent of contamination has not been delineated. Excavated material would be transported off site to a non-hazardous landfill for disposal.

LUCs would be implemented to prevent groundwater use.

Five-Year Reviews would be required for groundwater. However, Five-Year Reviews would not be required for subsurface soil because concentrations of contaminants in subsurface soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Alternative 9-3A: Excavation (Unrestricted Reuse), Off Site Disposal of Soil, Groundwater LUCs, and ISCO

Alternative 9-3A includes similar components to Alternative 9-3 with the addition of ISCO treatment of groundwater. Groundwater monitoring would be conducted to track changes in COC concentrations in order to assess the performance of ISCO. For this alternative, LUCs would only continue until ISCO is completed and the groundwater PRGs are met.

Five-Year Reviews would be required for groundwater until PRGs are met. However, Five-Year Reviews would not be required for the subsurface soil because concentrations of contaminants in subsurface soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Analysis of Alternatives

In accordance with CERCLA, a detailed analysis of the alternatives must be conducted with respect to the nine CERCLA evaluation criteria. These include the two threshold, five balancing, and two modifying criteria described in the box on page 7. An analysis of these criteria was performed for each remedial alternative, and summary comparisons of these analyses are presented in Table 10. Consult the Sites 5, 9, and 21 FFS Report for more detailed information.

Preferred Alternative

Alternative 9-2 is the Preferred Alternative for Site 9. Figure 7 shows the extent of the area covered by the existing barrier and LUCs for this Preferred Alternative. Based on information currently available, the Navy believes that the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent possible. However, the Preferred Alternative does not satisfy the preference for treatment as a principal element.

Why Does the Navy Recommend this Preferred Alternative?

The Preferred Alternative (Alternative 9-2) is recommended because it would meet the RAOs for the following reasons:

- This alternative would effectively prevent exposure to subsurface soil and groundwater contamination by maintaining the existing barrier and controlling use of and activities at the property.
- It would protect human health and the environment.
- LUCs at the sites can be incorporated into the Naval Station Great Lakes Base Master Plan and are not overly burdensome.
- Five-Year Reviews would be conducted to make sure the barriers and the LUCs are in place and maintained for continued protection of human health and the environment.
- It is deemed to be cost effective and represents a reasonable value for the money to be spent.
- Land use is not expected to change in the foreseeable future.

This recommended alternative can change in response to public comments or based on receipt of new information.

TABLE 10

SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES – SITE 9

EVALUATION CRITERION	ALTERNATIVE 9-1: NO ACTION	ALTERNATIVE 9-2: LUCs and Barrier	ALTERNATIVE 9-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 9-3: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 9-3A: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, Groundwater LUCs, and ISCO
Overall Protection of Human Health and Environment	Would not be protective. The potential for exposure of human receptors to contaminated soil would remain unchanged. Groundwater use restrictions would remain but could be lifted.	Would be protective of human health by minimizing exposure to contaminated soil and groundwater.	Would be protective of human health by minimizing exposure to contaminated soil and treating COCs in groundwater.	Would be protective of human health by removing contaminated soil from the site and by using LUCs to restrict the use of groundwater.	Would be protective of human health by removing contaminated soil from the site and by treating COCs in groundwater.
Compliance with ARARs and TBCs: • Chemical-Specific • Location-Specific • Action-Specific	• Would not comply • Not applicable • Not applicable	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply
Long-Term Effectiveness and Permanence	Would be neither effective nor permanent.	Would provide long-term effectiveness and permanence. Would be least effective because LUCs must be continually enforced to prevent exposure.	Would provide long-term effectiveness and permanence. Would be more effective than Alternative 9-2 because groundwater COCs are treated, but LUCs must be continually enforced to prevent exposure to soil contaminants.	Would provide long-term effectiveness and permanence. Would be more effective than Alternatives 9-2 and 9-2A because contaminated soil would be removed from the site.	Would provide long-term effectiveness and permanence. Would be most effective because contaminated soil would be removed from the site and groundwater COCs would be treated.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	None. There would be no treatment.	None. There would be no treatment.	There would be treatment of groundwater COCs.	None. There would be no treatment.	There would be treatment of groundwater COCs.

EVALUATION CRITERION	ALTERNATIVE 9-1: NO ACTION	ALTERNATIVE 9-2: LUCs and Barrier	ALTERNATIVE 9-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 9-3: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 9-3A: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, Groundwater LUCs, and ISCO
Short-Term Effectiveness	Would not result in risks to remediation workers or result in short-term adverse impacts to local community or the environment. Would not achieve RAOs or PRGs.	Would not result in risks to remediation workers or result in short-term adverse impacts to the local community or the environment. The LUC RD would be implemented in approximately 3 months and would achieve RAOs after implementation.	Slight increase in risks to remediation workers from ISCO that could be controlled by PPE and safety procedures. Potential short-term adverse impacts to the local community and the environment during oxidant transport. LUC RD would be implemented in approximately 3 months and would achieve RAOs after implementation. ISCO would be completed within 2 years.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impact to community from truck traffic. Action would be completed in 4 months. RAOs 1 and 2 would be met after completion of excavation. RAO 3 would be met upon implementation of LUCs.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impact to community from truck traffic and oxidant transport. Action would be completed in 4 months. RAOs 1 and 2 would be met after completion of excavation. RAO 3 would be met upon implementation of ISCO. ISCO would be completed within 2 years.
Implementability	Nothing to implement.	Would be easiest to implement.	Would be easier to implement than Alternatives 9-3 and 9-3A.	Would be less difficult to implement than Alternative 9-3A.	Would be most difficult to implement.
Costs: Capital NPW of Annual Costs NPW	 $0 $0 $0	 $21,000 $345,000 (30-Year) $366,000 (30-Year)	 $488,000 $346,000 (30-Year) $834,000 (30-Year)	 $3,220,000 $191,000 (30-Year) $3,411,000 (30-Year)	 $3,668,000 $192,000 (30-Year) $3,860,000 (30-Year)
State Acceptance	Assessment will be performed after comments on the Proposed Plan are received from Illinois EPA.				
Community Acceptance	Assessment will be performed after comments on the Proposed Plan are received from the public.				

Shading indicates preferred alternative.
Illinois EPA - Illinois Environmental Protection Agency
ISCO - In-situ Chemical Oxidation
LUC - Land Use Control
NPW - Net Present Worth
PPE - Personal Protective Equipment
PRG - Preliminary Remediation Goal
RAO - Remedial Action Objective
RD - Remedial Design
TBC - To Be Considered

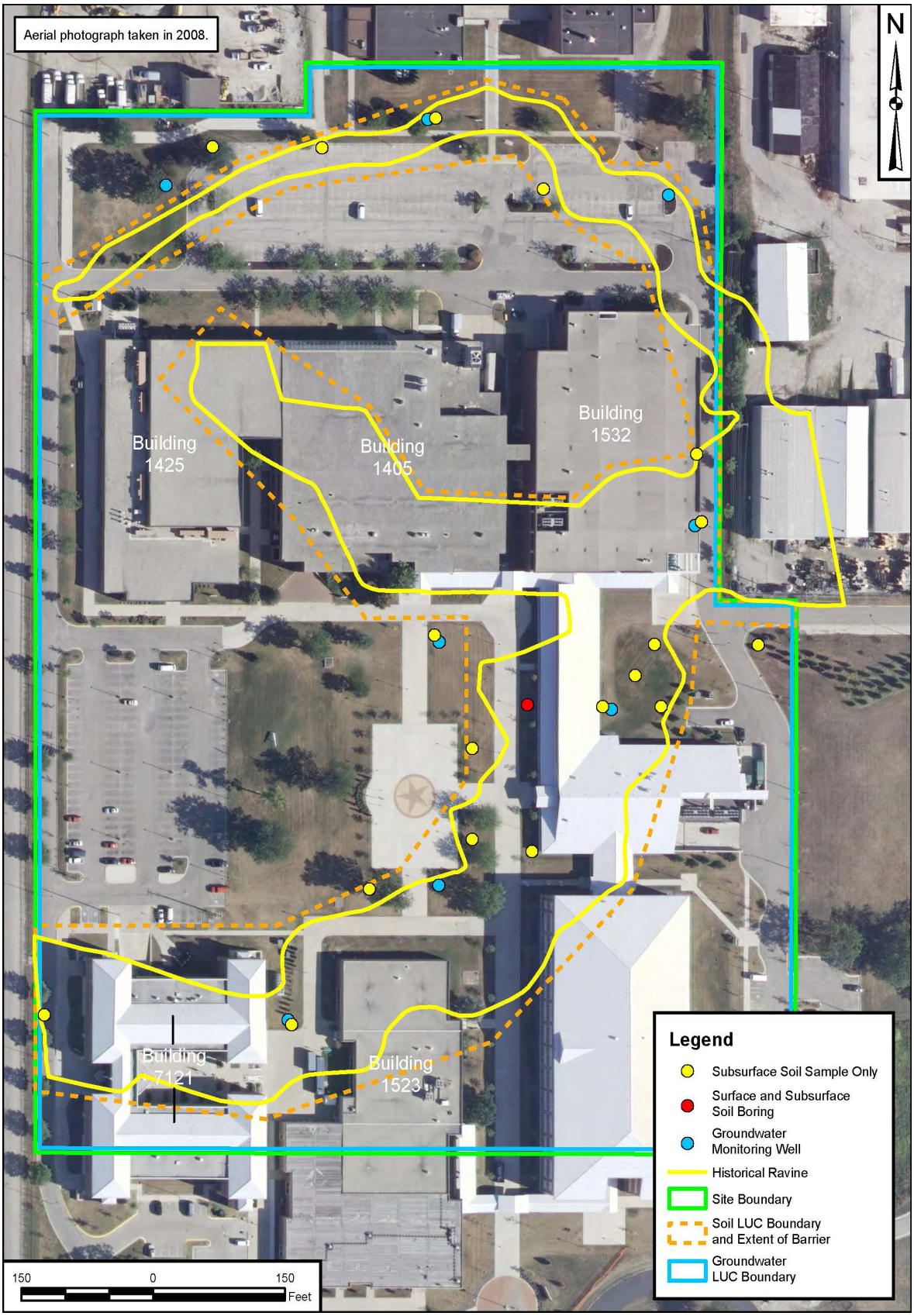


Figure 7: Site 9 - Barrier and Land Use Control Boundaries for Preferred Alternative

Proposed Plan for Site 21 – Buildings 1517/1506 Area

Background and Characteristics

Site 21 contains several buildings and parking lots and covers an area of approximately 7 acres (Figure 8). The site includes Building 1517, which is used for equipment storage, and Building 1506, which houses offices along with a garage and fueling station for base support and government vehicles. In addition, a storage building used by paint, plumbing, and electrical shops and a temporary hazardous waste storage area are located at the site. The investigations conducted at Site 21 are summarized in Table 11.

Building 1517 was historically associated with salvage operations at NSGL, and the area north of Building 1517 may have been used to store waste or scrap material on concrete pads next to rail spurs in the 1930s and 1940s. These materials may have been hauled away by railcar, or the waste materials may have been sent to an incinerator that was located in the northwestern portion of the site until 1964. Prior to 1950 until the 1960s or 1970s, a coal stockpile area covered most of Site 21 north of Building 1517. In addition to these on-site activities, Site 21 may have been impacted by leaks associated with USTs likely used for fuel or oil storage at Building 1600A, located northwest of Site 21, and from storage of transformers at Site 5, located south of Site 21.

Nature and Extent of Contamination

Soil borings drilled over a large portion of the northern and western sections of Site 21 prior to the construction of Building 1506 indicated the presence of thin zones of fill. The Navy conducted a RI in 2009 to determine the nature and extent of fill materials at the site and to identify potential risks associated with Site 21. The investigation included the collection of surface soil, subsurface soil, and groundwater samples, which were analyzed for VOCs, SVOCs, PCBs, pesticides, dioxins/furans, and metals. The locations of collected samples are shown on Figure 8.

Concentrations of PAHs, three pesticides, and several metals in surface soil and PAHs, two pesticides, and manganese in subsurface soil exceeded Illinois EPA TACO criteria. Concentrations of

Figure 8: Site 21 – Buildings 1517/1506 Area

Table 11 Previous Investigations and Site Documentation For Site 21

Investigation	Date	Activities
Closure of Former UST Site	2010	TolTest, Inc. completed closure of former UST at Building 1600A located approximately 200 feet west of Site 21. Several leaks associated with USTs, which were likely used for oil or fuel storage, were identified there. As part of the closure, TolTest removed tanks and soil, and installed, operated, and monitored a biosparge system to treat a groundwater plume. The groundwater plume was identified as extending east approximately 250 feet from the source and onto the northwest corner of Site 21.
RI	2012	Soil borings drilled prior to building construction indicated presence of thin zones of fill; therefore, a field investigation was conducted in 2009 to determine nature and extent of fill materials. Concentrations of PAHs, lead, and manganese in soil and pentachlorophenol (PCP), iron, and manganese in groundwater exceeded Illinois EPA TACO criteria. A risk assessment was performed using data from the Site 21 RI.

PCP, iron, and manganese in groundwater exceeded Illinois EPA TACO criteria; however, only PCP exceeded its respective MCL. Concentrations of other parameters were less than the Illinois EPA TACO criteria. Based on consideration of Illinois criteria exceedances as well as unacceptable human health risks, PAHs, arsenic, cobalt (subsurface soil only), iron, and lead (surface soil only) in soil and PCP in groundwater were selected as COCs. Site activities, such as the use of asphalt to pave the site, coal storage, herbicide/pesticide spraying, and vehicle maintenance, may have contributed to the presence of these COCs at the site.

High concentrations of PAHs in surface soil were detected in a sample near shops used for welding, electrical, HVAC, pipefitting, tiling, cement, carpentry, and painting and a RCRA hazard material storage facility. High concentrations of PAHs in subsurface soil were detected in a sample near a vehicle maintenance facility and fuel station and a leaking underground storage tank. Surface and subsurface soil samples were collected below asphalt. The presence of PAHs is believed to be the result of asphalt used to pave the site and former coal storage. High concentrations of metals were encountered in many surface soil and subsurface soil samples. PCP was detected in one groundwater sample located in the northwest corner of the site, which is the former location of the incinerator.

Summary of Risks

The investigation at Site 21 included evaluating potential human health risk from detected chemical concentrations in surface soil, subsurface soil, and groundwater. Potential receptors including construction workers, maintenance/occupational workers, trespassers, and hypothetical residents were evaluated in the risk assessment because they may come into direct contact with surface and/or subsurface soil. Construction workers might also encounter groundwater during excavation activities. Hypothetical residents could be exposed to groundwater by dermal contact, ingestion, and inhalation.

The site is covered by pavement and buildings; therefore, current human receptors are not exposed to soil at the site.

Non-cancer HI exceeded the target HI of 1 for arsenic and iron in surface soil and arsenic, cobalt, and iron in subsurface soil and cancer risk exceeded $1x10^{-4}$ for PAHs and arsenic in surface and subsurface soil for hypothetical future residents.

If hypothetical domestic use of groundwater for drinking and showering is taken into consideration, cancer risks are greater than $1x10^{-4}$ for PCP for hypothetical future residents. In addition, PCP concentrations exceeded its Illinois EPA criterion.

Although risks to I/C and construction workers were within the USEPA risk range (10^{-6} to 10^{-4}) in the HHRA, several samples had concentrations of several PAHs and arsenic that were greater than TACO criteria for I/C and construction workers exposure. PAH concentrations were greater than I/C TACO criteria in both surface and subsurface soil. PAH concentrations in surface soil and subsurface soil and arsenic concentrations in subsurface soil were greater than construction worker exposure criteria. Under current conditions exposure of I/C and construction workers to contaminated soil is prevented by the parking lots and buildings at Site 21.

It is the lead Agency's current judgment that the Preferred Alternative identified in this Proposal Plan, or one of the other active measures considered in the Proposal Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Remedial Action Objectives

The following RAOs were developed for Site 21:

RAO 1: Prevent residential exposure through ingestion, dust inhalation, and dermal contact with contaminated surface soil and subsurface soil with COC concentrations exceeding PRGs shown in Table 12.

RAO 2: Prevent I/C and construction worker exposure through ingestion, dust inhalation, and dermal contact to contaminated surface soil and subsurface soil with COC concentrations exceeding TACO criteria.

RAO 3: Return the groundwater resource to beneficial use, if practicable, and address human health risks associated with consumption of groundwater with COC concentrations exceeding PRGs shown in Table 13.

TABLE 12
Site 21 Surface and Subsurface Soil PRGs

COC	Surface Soil		Subsurface Soil	
	PRG	Basis	PRG	Basis
Residential Exposure				
Metals (mg/kg)				
Arsenic	13	Illinois EPA TACO	13	Illinois EPA TACO
Cobalt	-	-	24	HHRA
Iron	55,000	HHRA	55,000	HHRA
Lead	400	Illinois EPA TACO	-	-
Polynuclear Aromatic Hydrocarbons (µg/kg)				
Benzo(a)anthracene	1,800	Background	1,500	HHRA
Benzo(a)pyrene	2,100	Background	150	HHRA
Benzo(b)fluoranthene	2,100	Background	1,500	HHRA
Benzo(k)fluoranthene	9,000	Illinois EPA TACO	15,000	HHRA
Chrysene	88,000	Illinois EPA TACO	150,000	HHRA
Dibenzo(a,h)anthracene	420	Background	150	HHRA
Indeno(1,2,3-cd)pyrene	1,600	Background	1,500	HHRA

COC – Chemical of Concern
HHRA – Human Health Risk Assessment
Illinois EPA – Illinois Environmental Protection Agency
PRG – Preliminary Remediation Goal
TACO – Tiered Approach to Corrective Action Objectives

TABLE 13
Site 21 Groundwater PRGs

COC	Selected PRG (µg/L)	Rationale
PCP	1	Illinois EPA Class I GW Standard

GW – Groundwater
Illinois EPA – Illinois Environmental Protection Agency
PCP – Pentachlorophenol
PRG – Preliminary Remediation Goal

Remedial Action Alternatives

The FFS presents the options that the Navy developed for remedial action at the site to address the estimated 3,000 cy of contaminated soil. Based on the evaluation of various technologies documented in the FFS, the five remedial alternatives described below were developed and evaluated for Site 21 (see box on page 7 for evaluation criteria).

Alternative 21-1: No Action

This alternative is a "walk-away" alternative that maintains the site as is and is required for consideration under CERCLA to establish a basis for comparison with other alternatives. No restriction would be imposed to prevent access to the site, and the alternative would not address the site contamination. Under this alternative, the property would be released for unrestricted use. In addition, Five-Year Reviews would not be required.

Alternative 21-2: LUCs and Barrier

LUCs would be established at the site to make sure that the property is not developed for residential or non-residential special uses (such as for a park, day care, or school). LUCs would require review of construction activities and intrusive work in the area to protect workers and confirm proper management of contaminated media prior to construction activities. A LUC RD would be prepared to establish methods to prevent exposure to COCs and to restrict the disturbance of contaminated soil. A LUC RD would be developed after the signing of the ROD to document the LUC requirements.

LUCs would also be implemented to prevent groundwater use. LUCs would be permanent in the event of a change in land use or ownership.

Under this alternative, the existing pavement and buildings would be used as a barrier to prevent the exposure by I/C workers to soil contaminants exceeding I/C TACO criteria. Most of the site is covered by a combination of asphalt pavement and building foundations. The barrier would be required to remain intact.

Five-Year Reviews to evaluate the continued protectiveness of the remedy would be required for this alternative because contamination would remain in soil and groundwater in excess of concentrations that allow for unrestricted use and unlimited exposure.

Alternative 21-2A: LUCs Barrier, and ISCO

Alternative 21-2A includes components similar to Alternative 21-2, with the addition of ISCO treatment of groundwater and groundwater monitoring. Similar to Alternative 21-2, LUCs would be implemented to restrict groundwater use. For this alternative, groundwater LUCs would only continue until ISCO is completed and the groundwater PRGs are met. As for Alternative 21-2, soil LUCs would be maintained in the event of a change in land use or ownership.

To assess the performance of ISCO, groundwater monitoring would be performed to track changes in COC concentrations. Groundwater monitoring would continue until ISCO is complete and groundwater PRGs are met.

Five-Year Reviews would be required for soil because concentrations of contaminants will remain in soil in excess of concentrations acceptable for unrestricted use and unlimited exposure at the site. Groundwater would be subject to Five-Year Reviews until PRGs are met.

Alternative 21-3: Excavation (Unrestricted Reuse), Off Site Disposal of Soil, and Groundwater LUCs

Alternative 21-3 would consist of excavation of approximately 3,000 cy of contaminated soil to meet PRGs for residential exposure. Excavated material would be transported off site to a non-hazardous landfill for disposal.

LUCs would be implemented to prevent groundwater use.

Five-Year Reviews would be required for groundwater until PRGs are met. However, Five-Year Reviews would not be required for soil because concentrations of contaminants in soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Alternative 21-3A: Excavation (Unrestricted Reuse,) Off Site Disposal of Soil, Groundwater LUCs, and ISCO

Alternative 21-3A includes components similar to Alternative 21-3 with the addition of ISCO treatment of groundwater and groundwater monitoring. Groundwater monitoring would be conducted to track changes in COC concentrations in order to assess the performance of ISCO. For this alternative, LUCs would only continue until ISCO is completed and the groundwater PRGs are met.

Five-Year Reviews would be required for groundwater until PRGs are met. However, Five-Year Reviews would not be required for the soil because concentrations of contaminants in soil would be less than levels acceptable for unrestricted use and unlimited exposure at the site.

Analysis of Alternatives

In accordance with CERCLA, a detailed analysis of the alternatives must be conducted with respect to the nine CERCLA evaluation criteria. These include the two threshold, five balancing, and two modifying criteria described in the box on page 6. An analysis of these criteria was performed for each remedial alternative, and summary comparisons of these analyses are presented in Table 14. Consult the Sites 5, 9, and 21 FFS Report for more detailed information.

Preferred Alternative

Alternative 21-2 is the Preferred Alternative for Site 21. Figure 9 shows the extent of the area covered by the existing barrier and LUCs for this Preferred Alternative. Based on information currently available, the Navy believes that the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent possible. However, the Preferred Alternative does not satisfy the preference for treatment as a principal element.

Why Does the Navy Recommend this Preferred Alternative?

The Preferred Alternative for Site 21, Alternative 21-2, is recommended because it would meet the RAOs for the following reasons:

TABLE 14

SUMMARY OF COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES – SITE 21

EVALUATION CRITERION	ALTERNATIVE 21-1: NO ACTION	ALTERNATIVE 21-2: LUCs and Barrier	ALTERNATIVE 21-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 21-3: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 21-3A: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, Groundwater LUCs, and ISCO
Overall Protection of Human Health and Environment	Would not be protective. The potential for exposure of human receptors to contaminated soil would remain unchanged. Groundwater use restrictions would remain but could be lifted.	Would be protective of human health by minimizing exposure to contaminated soil and groundwater.	Would be protective of human health by minimizing exposure to contaminated soil and treating COCs in groundwater.	Would be protective of human health by removing contaminated soil from the site and by using LUCs to restrict the use of groundwater.	Would be protective of human health by removing contaminated soil from the site and by treating COCs in groundwater.
Compliance with ARARs and TBCs: • Chemical-Specific • Location-Specific • Action-Specific	• Would not comply • Not applicable • Not applicable	• Would comply • Not applicable • Would comply	• Would comply • Not applicable • Would comply	• Would comply. • Not applicable • Would comply	• Would comply. • Not applicable • Would comply
Long-Term Effectiveness and Permanence	Would be neither effective nor permanent.	Would provide long-term effectiveness and permanence. Would be least effective because LUCs must be continually enforced to prevent exposure.	Would provide long-term effectiveness and permanence. Would be more effective than Alternative 21-2 because groundwater COCs are treated, but LUCs must be continually enforced to prevent exposure to soil contaminants.	Would provide long-term effectiveness and permanence. Would be more effective than Alternatives 21-2 and 21-2A because soil contaminants are removed from the site.	Would provide long-term effectiveness and permanence. Would be most effective because soil contaminants are removed from the site and groundwater COCs are treated.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	None. There would be no treatment.	None. There would be no treatment.	There would be treatment of groundwater COCs.	None. There would be no treatment.	There would be treatment of groundwater COCs.

EVALUATION CRITERION	ALTERNATIVE 21-1: NO ACTION	ALTERNATIVE 21-2: LUCs and Barrier	ALTERNATIVE 21-2A: LUCs, Barrier, and ISCO	ALTERNATIVE 21-3: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, and Groundwater LUCs	ALTERNATIVE 21-3A: Excavation (Unrestricted Re-use), Off-Site Disposal of Soil, Groundwater LUCs, and ISCO
Short-Term Effectiveness	Would not result in risks to remediation workers or result in short-term adverse impacts to local community or the environment. Would not achieve RAOs or PRGs.	Would not result in risks to remediation workers or result in short-term adverse impacts to the local community and the environment. LUC remedial design would be implemented in approximately 3 months and would achieve RAOs after implementation.	Slight increase in risks to remediation workers from ISCO that could be controlled by PPE and safety procedures. Potential short-term adverse impacts to the local community and the environment during oxidant transport. LUC RD would be implemented in approximately 3 months and would achieve RAOs after implementation. ISCO would be completed within 2 years.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impacts to the community from truck traffic. Action would be completed in 2 months. RAOs 1 and 2 would be met after completion of excavation and RAO 3 would be met upon implementation of LUCs.	Exposure of remediation workers would be controlled by PPE and safety procedures. Potential impact to community from truck traffic and oxidant transport. Action would be completed in 2 months. RAOs 1 and 2 would be met after completion of excavation. RAO 3 would be met upon implementation of ISCO. ISCO would be completed within 2 years.
Implementability	Nothing to implement.	Would be easiest to implement.	Would be easier to implement than Alternatives 21-3 and 21-3A.	Would be less difficult to implement than Alternative 21-3A.	Would be most difficult to implement.
Costs: Capital NPW of Annual Costs NPW	 $0 $0 $0	 $21,000 $345,000 (30-Year) $366,000 (30-Year)	 $554,000 $346,000 (30-Year) $900,000 (30-Year)	 $1,244,000 $192,000 (30-Year) $1,436,000 (30-Year)	 $1,686,000 $192,000 (30-Year) $1,878,000 (30-Year)
State Acceptance	Assessment will be performed after comments on the Proposed Plan are received from Illinois EPA.				
Community Acceptance	Assessment will be performed after comments on the Proposed Plan are received from the public.				

Shading indicates preferred alternative.
Illinois EPA - Illinois Environmental Protection Agency
ISCO - In-situ Chemical Oxidation
LUC - Land Use Control
NPW - Net Present Worth
PPE - Personal Protective Equipment
PRG - Preliminary Remediation Goal
RAO - Remedial Action Objective
RD - Remedial Design
TBC - To Be Considered

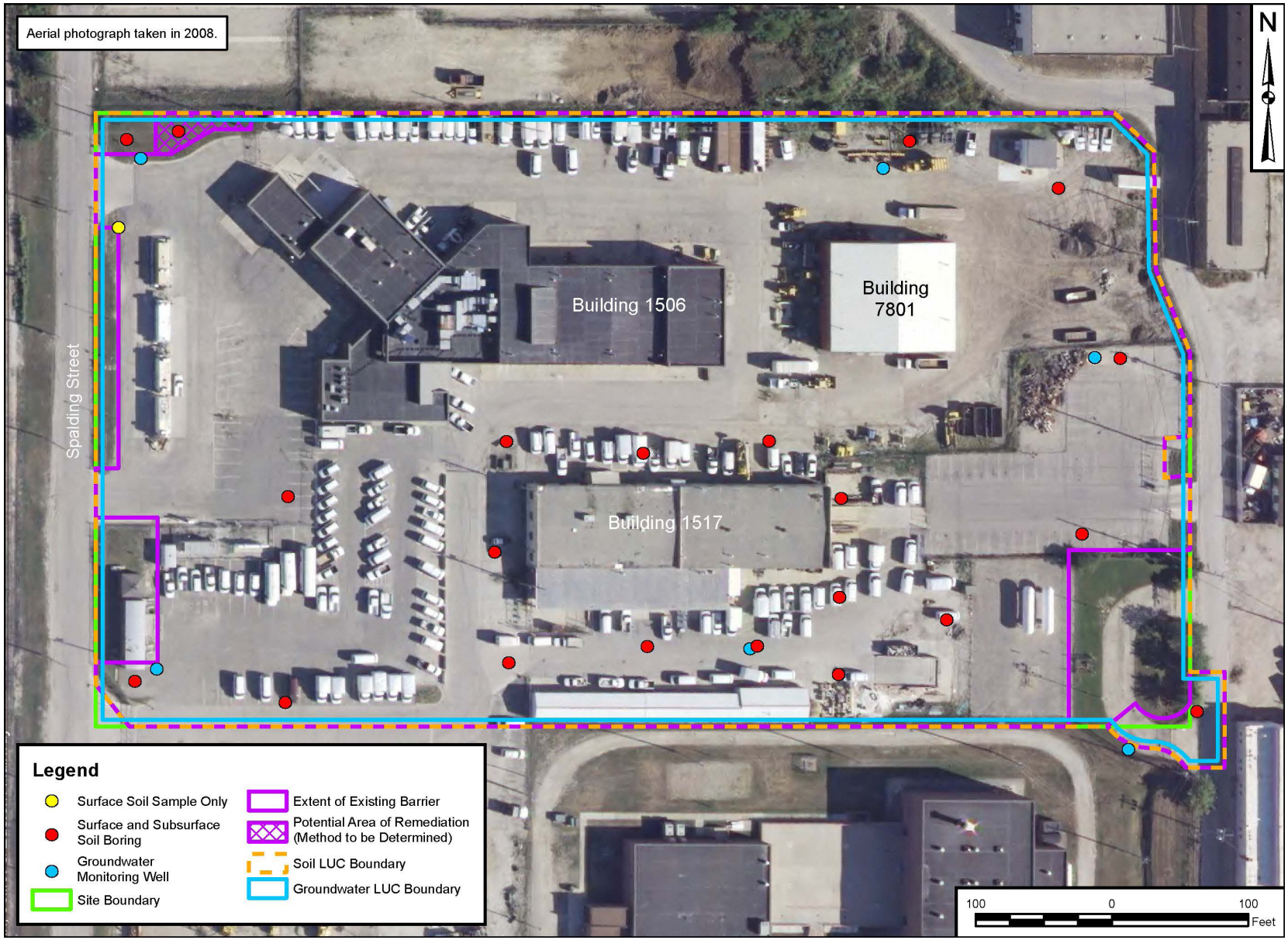


Figure 9: Site 21 - Barrier and Land Use Control Boundaries for Preferred Alternative

- This alternative would effectively prevent exposure to surface and subsurface soil and groundwater contamination by maintaining the existing barrier and controlling use of and activities at the property.
- It would protect human health and the environment.
- LUCs at the sites can be incorporated into the Naval Station Great Lakes Base Master Plan and are not overly burdensome.
- Five-Year Reviews would be conducted to make sure the barrier and the LUCs are in place and maintained for continued protection of human health and the environment.
- It is deemed to be cost effective and represents a reasonable value for the money to be spent.
- Land use is not expected to change in the foreseeable future.

This recommended alternative can change in response to public comments or based on receipt of new information.

Next Steps

The Navy will receive comments on the Preferred Alternatives for Sites 5, 9, and 21 during the 30-day public comment period (March 14 to April 14, 2014). A public meeting will be conducted if there is significant public interest. In response to public comments or upon receipt of new information, the Preferred Alternatives for the sites may change. By June 2014, the Navy expects to have reviewed comments and signed the ROD describing the chosen remedial action. The ROD, which includes a summary of responses to public comments, will then be made available to the public at NSGL, 201 Decatur Avenue, Building 1A, Environmental Division, Great Lakes, IL 60088. The Navy will also announce its decision through the local news media.

For More Detailed Information

To help the public understand and comment on the proposal for these sites, this publication summarized a number of reports and studies. The technical and public information prepared to date for the site is available online at: http://go.usa.gov/DyNB. From that website, click on "Administrative Records," select "Administrative Record File," and search for "SITE 5," "SITE 9," and "SITE 21" documents in the Basic Search box. If you do not have a computer or internet access, hard copies of the Administrative Record can be viewed at NSGL. Please contact Ms. Van Donsel at 847-688-2600, extension 136 to arrange a time and location for reviewing the information.

Glossary of Terms

This glossary defines the terms used in this Proposed Plan. The definitions in this glossary apply specifically to this Proposed Plan and may have other meanings when used in different circumstances.

Administrative Record: The complete body of documents pertaining to the investigation and restoration of an environmental facility. This body of documents is kept at a location where it can be accessed by the general public.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal, state, and local environmental rules, regulations, and criteria that must be met by the selected cleanup action under CERCLA.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law also known as "Superfund." This law was passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). This law created a special tax that goes into a trust fund to investigate and cleanup abandoned or uncontrolled hazardous waste sites.

Conceptual Site Model (CSM): Identifies contaminant sources, contaminant release mechanisms, transport routes, and receptors under current and future land use scenarios for a site.

Dioxin: A family of compounds known chemically as dibenzo-p-dioxins. Concern about them arises from their potential toxicity and contaminants in commercial products. Tests on laboratory animals indicate that it is one of the more toxic man-made compounds.

Focused Feasibility Study (FFS): A report that presents the development, analysis, and comparison of cleanup alternatives.

Furan: Any of a family of compounds known chemically as furans. They are chemicals formed during combustion. They are extremely toxic.

Hazard Index (HI): The ratio of the daily intake of chemicals from onsite exposure divided by the reference dose for those chemicals. The reference dose represents the daily intake of a chemical that is not expected to cause adverse health effects.

Human Health Risk Assessment (HHRA): Evaluation and estimation of current and future potential for adverse human health effects from exposure to chemicals.

In situ chemical oxidation (ISCO): ISCO refers to the injection and distribution of an oxidant into the subsurface to achieve oxidation of the chemicals of concern (COCs) present in soil and/or groundwater. The target COCs are generally oxidized to relatively non-toxic products, such as carbon dioxide and water. ISCO treatment systems utilize one or more strong oxidants, which typically include permanganate, persulfate, hydrogen peroxide, or ozone.

Initial Assessment Study (IAS): Review of historical records and aerial photographs, field inspections, and personnel interviews to evaluate the potential for environmental impacts at numerous sites across the base.

Land use controls (LUCs): Engineered and non-engineered measures formulated and enforced to regulate current and future land use options. Engineered measures can include fencing and posting. Non-engineered measures typically consist of administrative deed restrictions that prohibit residential development and/or construction restrictions.

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water delivered to any user of a public system. MCLs are enforceable standards.

Memorandum of Agreement (MOA): An agreement between Illinois EPA and NSGL, on behalf of the Department of the Navy, to implement base wide, certain periodic site inspections, condition certifications, and agency notification procedures to ensure the maintenance by NSGL personnel of site-specific LUCs deemed necessary for present or future protection of human health and the environment.

Metals: Metals are naturally occurring elements. Some metals, such as arsenic, can have toxic effects. Other metals, such as iron, are essential to the metabolism of humans. Metals are classified as inorganic because they are a mineral and not of biological origin.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal government's blueprint for responding to both oil spills and hazardous substance releases. The NCP is the result of our country's efforts to develop a national response capability and promote overall coordination among the hierarchy of responders and contingency plans.

Net Present Worth (NPW): A present-worth analysis is used to evaluate costs that occur over different time periods by discounting future costs to a common base year. It represents the amount of money that, if invested in the base year and dispersed as needed, would be sufficient to cover the costs associated with the remedial action over its planned life. NPW considers both capital (construction) costs and costs for annual operation and maintenance.

Pentachlorophenol (PCP): A chlorinated hydrocarbon insecticide and fungicide used primarily to protect timber from fungal rot and wood-boring insects.

Polychlorinated biphenyls (PCBs): A family of compounds commonly used in electric transformers as insulators and coolants, in lubricants, adhesives, and caulking compounds. PCBs are extremely persistent in the environment because they do not readily break down into less harmful chemicals.

Polynuclear aromatic hydrocarbons (PAHs): High molecular weight, relatively immobile, and moderately toxic solid organic chemicals that feature multiple benzenic (aromatic) rings in their chemical formula. PAHs are typically formed during the incomplete combustion of coal, oil, gas, garbage, or other organic substances.

Preliminary Remediation Goals (PRGs): Chemical-specific goals for site contaminants that when achieved will result in site concentrations that pose acceptable risk for the targeted receptor.

Record of Decision (ROD): An official document that describes the selected remedy for a specific site. The ROD documents the remedy selection process and is issued by the Navy, with concurrence of Illinois EPA following the public comment period.

Remedial Action Objective (RAO): The RAOs are medium-specific goals that define the objectives of conducting cleanups to protect receptors that are at risk from contaminated media.

Remedial Design (RD): The phase in Superfund site cleanup where the technical specifications for cleanup remedies and technologies are designed.

Remedial Investigation (RI): Mechanism for data collection to characterize site conditions and determne the nature and extent of contamination.

Resource Conservation and Recovery Act (RCRA): Establishes a regulatory framework for national programs to achieve environmentally sound management of both hazardous and nonhazardous wastes.

Responsiveness Summary: A summary of written and oral comments received during the public comment period, and the Navy's responses to these comments. The Responsiveness Summary is an important part of the ROD, highlighting community concerns for decision makers.

Semivolatile organic compound (SVOC): An organic compound with a boiling point higher than water that may vaporize when exposed to temperatures above room temperature. SVOCs include phenols and PAHs.

Tiered Approach to Corrective Action Objectives (TACO): The Illinois EPA's method for developing remediation objectives for contaminated soil and groundwater. These remediation objectives protect human health and take into account site conditions and land use. Remediation objectives generated by TACO are risk-based and site-specific.

Underground Storage Tank (UST): A tank buried underground, usually used to store petroleum and other chemicals.

Verification Study (VS): An investigation conducted to confirm the presence of contaminants.

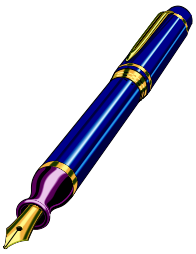
Volatile organic compound (VOC): Any organic compound that has a high tendency to pass from the solid or liquid state to the vapor state under typical environmental conditions.

What's a Formal Comment?

Formal comments are used to improve the final decision for the remedy selected for each site. During the 30-day formal comment period, the Navy will accept formal written comments and hold a meeting, if requested, to accept formal verbal and written comments. To make a formal comment, you need to submit a written comment during the comment period or present your views during the public meeting.

A request for an extension to the public comment period (minimum of 30 days) must be made in writing. A request for a public meeting to present your formal comments must also be made in writing. These requests must be postmarked no later than April 14, 2014. Written comments and requests for a public meeting or an extension of the public comment period should be sent to:

Department of the Navy
Naval Station Great Lakes
NAVFAC Midwest
Attn: Terese Van Donsel
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, IL 60088
Email: terese.vandonsel@navy.mil



Federal regulations require the Navy to distinguish between "formal" and "informal" comments. Although the Navy uses public comments throughout site investigation and cleanup activities, the Navy is only required to respond in writing to formal comments on the Proposed Plan. If a public meeting is held, there will be no Navy verbal responses to your comments during the formal meeting portion of the meeting. After the formal portion of the public meeting is closed, the Navy may respond to informal questions.

The Navy will review the transcript of formal comments received at the meeting and written comments received during the formal comment period before making a final decision. They will then prepare a written response to formal comments. The transcript of formal comments and the Navy's written responses will then be included in the Responsiveness Summary issued as part of the final ROD.

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Use This Space to Write Your Comments

The Navy wants your written comments on the options under consideration for dealing with Site 5 - Transformer Storage Boneyard, Site 9 - Camp Moffett Ravine Fill Area, and Site 21 - Buildings 1517/1506 Area. You can use the form below to send written comments or to request that a formal public meeting be held. Additionally the form below can be used to request an extension. A request for an extension to the public comment period (minimum of 30 days) must be made in writing. A request for a public meeting to present your formal comments must also be made in writing.

If you have questions about how to comment, please call Terese Van Donsel at 847-688-2600, extension 136. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than April 14, 2014, to the address below. Comments may also be e-mailed to the address shown below:

Department of the Navy
Naval Station Great Lakes
NAVFAC Midwest
Attn: Terese Van Donsel
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, IL 60088
E-mail: terese.vandonsel@navy.mil

Comment submitted by: _____

(Attach additional sheets as needed)

FOLD HERE

Place
Stamp
Here

Department of the Navy
Naval Station Great Lakes
NAVFAC Midwest
Attn: Terese Van Donsel
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, IL 60088