
Proposed Plan

Naval Auxiliary Air Station Quillayute

DERP-FUDS Site No. F10WA0121



Clallam County, Washington
April 15, 2016

U.S. Army Corps of Engineers
Kansas City District (CENWK)
Seattle District (CENWS)

1.0 INTRODUCTION

This Proposed Plan summarizes the basis for the U.S. Army Corps of Engineers (USACE)¹ proposed response action at the Naval Auxiliary Air Station (NAAS) Quillayute, a Formerly Used Defense Sites (FUDS) Hazardous, Toxic and Radioactive Waste (HTRW) project. The USACE, as the lead agency, on behalf of the U.S. Department of Defense (DoD), developed this Proposed Plan with support from the Washington Department of Ecology (WDOE). The USACE, in consultation with WDOE, is issuing this Proposed Plan to fulfill, in part, public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**² of 1980 as amended, and Section 300.430(f)(3)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The **Remedial Investigation (RI)** and **Baseline Risk Assessment (BLRA)** for the NAAS Quillayute show that **remedial** action is not needed because the DoD-related contamination does not pose an unacceptable risk to people's health or the environment.

Dates to Remember

Public Comment Period:

April 22, 2016 - May 27, 2016

Public Meeting: May 25, 2016

Location Rainforest Arts Center

Address 35 N. Forks Avenue

Forks, Washington

TIME: 6:00 pm

This Proposed Plan summarizes the extensive information from the RI, the BLRA, and other documents contained in the **Administrative Record File**. The USACE encourages the public to review these documents in the Administrative Record File (see Section 7) for this site. This Proposed Plan is intended to inform the public of USACE's recommendation and to solicit public comments pertaining to the no remedial action recommendation.

2.0 COMMUNITY ROLE IN RESPONSE ACTION SELECTION PROCESS

The USACE is soliciting public comments on the recommendation presented in this Proposed Plan to ensure the concerns of the community are considered. The public may submit comments on this Proposed Plan during the comment period beginning April 22, 2016, and concluding on May 27, 2016.

All written comments should be sent during the public comment period to:

Mr. Mirek Towster
U.S. Army Corps of Engineers, Kansas City District
635 Federal Building
601 E. 12th Street
Kansas City, Missouri 64106-2896

¹ A list of abbreviations can be found in Section 9.

² Bolded terms are included in the glossary in Section 8

A public meeting will be held during the public comment period at the Rainforest Arts Center in Forks, Washington, on May 25, 2016 at 6:30 p.m. A public availability session with USACE and WDOE will precede the public meeting beginning at 6:00 pm.

Written comments received at the public meeting, as well as during the public comment period, will be summarized in the **Responsiveness Summary** of the **Decision Document**. The Decision Document will document the final decision for the former NAAS Quillayute. The USACE will make the final decision after reviewing and responding to all significant comments received during the public comment period.

3.0 SITE BACKGROUND

The former NAAS Quillayute is located along Quillayute Road in Clallam County, Washington approximately 15 miles west of the City of Forks and approximately four miles east of the Pacific Ocean (Figure 1). The 1,202-acre property is located in Sections 1, 12 and 13 of Township 28 North, Range 15 West, and Sections 7, 8, 17 and 18 of Township 28 North, Range 14 West, Willamette Meridian.

The majority of the site is located north of Quillayute Road and includes two runways (Figure 2). The northwest-southeast trending Runway #1 has been closed since 1977 while Runway #2 is still open and is part of the Quillayute Airport.

3.1 SITE HISTORY

The 1,202-acre property was acquired by the War Department in the early 1940s and developed as an auxiliary air station for joint U.S. Army and U.S. Navy use. During World War II, the facility was used for practice B-24 bombing missions³, P-38 fighter aircraft missions, and deployment of surveillance blimps. Jurisdiction over the facility was fully transferred to the U.S. Navy in 1944 when it was officially commissioned 'NAAS Quillayute'. In June 1946, the property was declared excess and was transferred to the General Services Administration for disposal without restriction.

A majority of the property was acquired by the State of Washington in 1962 for use as an emergency landing field while the rest of the property was sold to the Quillayute Prairie School District or to private individuals. The site was used as a clubhouse and campsite for a flying club from 1964 to 1975.

The portion of the site occupied by the Quillayute Airport is currently owned and operated by the City of Forks. The Quillayute Airport is primarily used by recreational fliers.

4.0 SITE CHARACTERISTICS

4.1 SITE LAND USE

The former NAAS Quillayute Administration and Operations Area (light yellow area in Figure 2) is mostly within the Quillayute Airport and the parcels that comprise this area currently are owned by the City of Forks and the State of Washington. The portion of the former Administration and Operations Area that includes Runway #2 is owned by the City of Forks while the remaining portions of the area, including Runway #1, are owned by the State of Washington. Runway #2 was upgraded by the City of Forks in 2002 and is the main operational runway of the Quillayute Airport. Runway #2, currently designated as Runway 4/22, is listed by the Federal Aviation Administration as an active runway while Runway #1 is inactive (http://www.wsdot.wa.gov/aviation/AllStateAirports/Quillayute_Quillayute.htm).

³ No evidence found of bombing ranges at the site.

The portion of the former Industrial Complex Area (purple area in Figure 2) north of Quillayute Road is within the fenced-in area of the Quillayute Airport. The portion of the former Industrial Complex Area south of Quillayute Road is now comprised of privately owned parcels. Some are undeveloped while others are occupied by residential structures.

The West Parcels Area (dark blue area in Figure 2) has been subdivided into multiple parcels with residential home sites.

The East Parcels Area (dark yellow area in Figure 2) has been subdivided and now consists of a mix of residential home sites and undeveloped lots.

The Army Cantonment/HOMOJA Housing Area (green area in Figure 2) consists of one parcel that is privately owned based on Clallam County assessor records.

The Runway Approach Zones to the south and north (pink areas on Figure 2) are owned by the City of Forks and the State of Washington, respectively, based on the Clallam County assessor records.

4.2 TOPOGRAPHY, HYDROGEOLOGY, AND CLIMATE

The former NAAS Quillayute is located within the Quillayute Prairie, a broad plain between the Dickey River and the Sol Duc River. Most of site is relatively level, with the ground surface descending to the northeast and to the southwest.

Water supply wells present within the site were sampled during multiple investigations that occurred between 2002 and 2011. These water supply wells derive water from the sand and gravel lenses which are typically between 5 and 20 feet thick within the thick glacial till deposits; water well records show water is found between 90 to 140 feet below ground surface. The **groundwater** flow direction varies across the site, with groundwater flowing in an easterly direction in the area south of Quillayute Road and west-southwest in the area north of Quillayute Road.

The former NAAS Quillayute is located in the West Olympic-Coastal area of Washington where climate is heavily influenced by the Pacific Ocean to the west and the Olympic Mountains to the east. Annual precipitation ranges from 70 to 100 inches over the Coastal Plains to 150 inches or more along the windward slopes of the Olympic Mountains. At the weather station operated by the National Oceanic and Atmospheric Administration (NOAA) located within the Quillayute Airport, the average annual precipitation for the period from 1981 to 2010 is 99.54 inches with most of the precipitation occurring in the winter-spring months. Average temperatures range from a high of 60 degrees Fahrenheit (°F) in July-August to a low of 40°F in December-January.

4.3 SURFACE WATER

The Dickey River cuts across the runway approach zone northwest of Runway #1 and is below the plateau where the runway is located (Figure 2). Sol Duc River is located approximately 1.5 miles southeast of the site. The confluence of the Sol Duc River with the Bogachiel River approximately two miles south of the site forms the Quillayute River which flows west approximately four miles before discharging into the Pacific Ocean. Dickey River joins the Quillayute River near its mouth at the Pacific Ocean.

5.0 INVESTIGATIONS

There have been multiple environmental investigations which are documented in reports that are included in the Administrative Record:

- Site inspection by USACE, 1992
- Soil investigation by WDOE, 1999
- Sample collection from a private well (the NI well) by the City of Forks, 2002
- Preliminary site investigation by USACE, 2000
- Preliminary assessment by USACE, 2002
- Limited groundwater investigation by USACE, 2004
- Underground storage tank closure by USACE, 2004
- Expanded groundwater investigation by USACE, 2006
- RI field sampling activities by USACE, 2009-2011
- Baseline Risk Assessment (BLRA) by USACE, 2013

The USACE investigations studied the type and amount of contamination at the site and possible risks to people's health or the environment. Investigation areas were determined based on historical building locations and areas where potential chemical releases may have occurred. The USACE conducted investigations for 10 Investigation Areas (Table 1 and Figures 3 through 7). Table 2 provides a summary of sampling events at each investigation area.

Table 1. Summary of NAAS Quillayute investigation areas

Investigation Area	Description
Investigation Area 1	Soil at Administration and Operations Area
Investigation Area 2	Soil at East Parcels Area
Investigation Area 3	Soil at Industrial Complex Area
Investigation Area 4	Closure of underground storage tank sites
Investigation Area 5	Groundwater at West Parcels Area
Investigation Area 6	Groundwater at Quillayute Airport Area
Investigation Area 7	Groundwater in the Vicinity of B44
Investigation Area 8	Groundwater in the Vicinity of the NI well
Investigation Area 9	Vapor Intrusion in the Vicinity of the B44 slab
Investigation Area 10	Vapor Intrusion in the Vicinity of the NI well

5.1 SOIL INVESTIGATION AREAS

The following is a summary of findings from soil investigations at the Administration and Operations Area, the East Parcels Area, and the Industrial Complex Area. The soil samples were collected next to former building locations and areas where historical operations may have resulted in chemical releases.

If a chemical was detected in the soil samples, the risk from exposure to this chemical was evaluated in a two-step process. First, the concentrations of the chemicals detected in the soil samples were compared against conservative screening levels from USEPA and WDOE. If the concentrations were below the screening levels, then there are no unacceptable risks from exposure to these detected chemicals and no further evaluation is required. The second step of the risk evaluation process was performed if concentrations in the soil samples were greater than the screening levels. If the concentrations of a chemical in soil samples were greater than the screening levels, then the chemical was identified as a **Chemical of Potential Concern (COPC)** in the BLRA and risks were further evaluated. Section 6 summarizes the results of the BLRA. A summary of the soil samples collected and COPCs from each Investigation Area/Building are shown in Table 3. Table 4 lists the range of concentrations of chemicals that were identified as COPCs in the soil samples.

Table 2. Summary of sampling events at each investigation area

Investigation Area	Description	Sampling Activities from 1992 to 2002	Groundwater Site Investigations in 2004 and 2006	Result of March 2009 through December 2011 RI	Remedial Actions/ Removal Actions
1	Soil at Administration and Operations Area	PAHs and metals detected above SLs	No chemical detected above SLs	No chemical detected above SLs	--
2	Soil at East Parcels Area	--	--	PAHs detected above SLs	--
3	Soil at Industrial Complex Area	PAHs and metals above SLs	--	PAHs, pentachlorophenol, and naphthalene detected above SLs	--
4	Underground storage tank closure	--	--	--	Underground storage tank sites closed in 2004
5	Groundwater at West Parcels Area	--	Bis(2-ethylhexyl)phthalate and arsenic detected above SL	Bis(2-ethylhexyl)phthalate detected above SLs	--
6	Groundwater at Quillayute Airport	Carbon tetrachloride and chloroform detected above SLs	--	No compound detected above SLs	--
7	Groundwater in the Vicinity of B44	--	--	Carbon tetrachloride detected above SLs	--
8	Groundwater in the Vicinity of the NI Well	Lead and carbon tetrachloride were detected above SLs)	Carbon tetrachloride detected above SLs.	Carbon tetrachloride detected above SLs	--
9	Vapor Intrusion in the vicinity of the B44 slab	--	--	1,2-dichloroethane, benzene, carbon tetrachloride, and tetrachloride detected above SLs	--
10	Vapor Intrusion in the vicinity of the NI Well	--	--	No compound detected above SLs	--

PAHs: polycyclic aromatic hydrocarbons; SLs: Screening Levels

Table 3. Summary of Remedial Investigation soil sample analysis performed for each investigation area

Building/Area of Potential Concern	Sampling Date	VOCs	SVOCs	PAHs	PCBs	RCRA metals	Silver	Chemicals of Potential Concern (USACE 2013)
Investigation Area 1								
LD Alleged Liquid Disposal Area	November 2009	✓	✓	✓	--	--	✓	None
Investigation Area 2								
B101 and B102 Radio and Generator Building	April 2009	--	--	✓	✓	--	--	PAHs
Investigation Area 3								
B4 Public Works Shop	March and November 2009	--	✓	✓	--	--	✓	Pentachlorophenol, PAHs
B5 Transportation Maintenance	April and November 2009	--	✓	✓	--	--	✓	Naphthalene, Pentachlorophenol, PAHs
B6 Fire Station	November 2009	✓	--	--	--	--	--	None
B7 Transformer Vault	March 2009	--	--	✓	✓	--	--	PAHs
B9 Blacksmith	March 2009	--	✓	✓	--	--	✓	PAHs
B10 Gunnery Training	March 2009	--	✓	✓	--	--	✓	PAHs
B11 Radio/Radar Building	March 2009	--	--	✓	✓	--	--	PAHs
B12 Class "C" Overhaul Shop	March, July, and November 2009	✓	✓	✓	--	--	✓	PAHs
B17 Wash rack and shelter	April and November 2009	--	✓	✓	--	--	✓	Pentachlorophenol, PAHs
B18 and B19 Paint Shops	March and November 2009	✓	✓	✓	--	--	✓	None
B20 Hangar	March, July, and November 2009	✓	✓	✓	--	--	✓	Pentachlorophenol, PAHs
B29 Photograph Laboratory	April and November 2009	✓	✓	✓	--	--	✓	None
B41 Boiler and Generator (borehole for MW-14)	March and November 2009 December 2010	✓	✓	✓	✓	✓	✓	PAHs
B44 Dry Cleaner	November 2009, December 2010	✓	--	--	--	--	--	None
B49 Auxiliary Generator Building	March 2009	--	--	✓	✓	--	--	PAHs
B65 Auxiliary Generator Building	March 2009	--	--	✓	✓	--	--	None
B119 and B119A Paint Shops	March 2009	✓	✓	✓	--	--	✓	None
E120 (Fire Station)	December 2010	✓	?--	--	--	✓	--	None
TL Suspected Tetraethyl Lead Disposal Area (Sludge Disposal Area)	November 2009	✓	✓	✓	--	--	--	None

COPC: chemical of potential concern, PAH: polycyclic aromatic hydrocarbon; **PCB: polychlorinated biphenyl**; RCRA: Resource Conservation and Recovery Act; **SVOC: semi-volatile organic compound**; **VOC: volatile organic compound**

Note: RCRA metals include: silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium

Table 4. Summary of detections in soil samples for the BLRA chemicals of potential concern

Chemical of Potential Concern	Number of soil sample analyses	Number of Detections	Minimum Detection (µg/kg)	Maximum Detection (µg/kg)
<i>Semi-volatile organic compounds</i>				
Naphthalene	168	44	2.4 J	4600
Pentachlorophenol	157	14	30 J	1600
<i>Polycyclic aromatic hydrocarbons</i>				
Benzo(a)anthracene	224	149	0.5 J	3600
Benzo(a)pyrene	224	161	0.25 J	3700
Benzo(b)fluoranthene	224	164	0.34 J	4100
Benzo(k)fluoranthene	224	124	0.16J	1800
Chrysene	224	168	0.42 J	4500
Dibenz(a,h)anthracene	224	134	0.3 J	580
Indeno(1,2,3-cd)pyrene	224	161	0.28 J	2200

J: estimated value; µg/kg: micrograms per kilogram

5.1.1 Soil at Administration and Operations Area (Investigation Area 1)

Soil samples were collected in 2009 during the RI from a suspected liquid disposal area located at the southwestern end of Runway #2 (Figure 3). This area was identified during the 2002 preliminary assessment by an anonymous caller who indicated that liquid wastes from aircraft were disposed of to the ground surface in an area off to the southwest end of Runway #2.

The BLRA did not identify any COPCs for this Investigation Area since none of the chemicals detected in the soil samples from the suspected liquid disposal area exceeded screening levels. Therefore, no further evaluation of risk in the BLRA was needed in the Administration and Operations Area.

5.1.2 Soil at East Parcels Area (Investigation Area 2)

Two former buildings B101 and B102 were located in the East Parcels Area (Figure 4). B101 was reportedly used for radio communications and B102 housed the generators that supplied power to B101. Both buildings were reportedly removed in the 1960s.

The soil samples collected in 2009 during the RI from locations around the footprints of these former buildings contained **polycyclic aromatic hydrocarbons (PAHs)** at concentrations that exceeded screening levels. These PAHs were identified as COPCs in the BLRA and risks from exposure to these chemicals were evaluated.

5.1.3 Soil at Industrial Complex Area (Investigation Area 3)

The Industrial Complex consisted of two non-contiguous areas (see purple areas in Figure 2), with all of the areas of potential sources being located within the western portion of the Industrial Complex Area (Figure 5). The areas of potential sources consisted of former buildings where historical operations may have resulted in chemical releases and a suspected sludge disposal area. Soil samples were collected in 2009 and 2010 from locations around the footprint of the former buildings and from the suspected sludge disposal area. The portion of the Industrial Complex Area located north of Quillayute Road is within the fenced-in area of the Quillayute Airport and includes the following areas of potential sources (shown on Figure 5):

- B5, Transportation Maintenance and B17 Wash Rack and Shelter. The buildings have been demolished; however, the building foundation slabs are still present and were covered by heavy vegetation during the March 2012 site visit. The BLRA COPCs identified in soil samples from B5

were naphthalene, pentachlorophenol and PAHs. The BLRA COPCs identified in the soil samples from B17 were pentachlorophenol and PAHs.

- B7 and B11, Transformer Vault and Radar/Radio Building. The BLRA COPCs identified in soil samples from B7 and B11 were PAHs.
- B10, Gunnery Training. This building has been demolished; however, the concrete building slab is still present. The area surrounding the slab was covered by heavy vegetation during the March 2012 site visit. The BLRA COPCs identified in the soil samples from B10 were PAHs.
- B12, Class “C” Overhaul Shop. This building was still present and was observed to be in major disrepair during the March 2012 site visit. The BLRA COPCs identified in the soil samples from B12 were PAHs.
- B18 and B19, Paint Shops. These buildings have been demolished. None of the chemicals detected in the soil samples from B18 and B19 exceeded screening levels. Therefore, no COPCs in the BLRA were identified at these former buildings.
- B20, Hangar. This hangar building is still present at the site. The BLRA COPCs identified in the soil samples from B20 for B20 were pentachlorophenol and PAHs.
- B29, Photography Laboratory. This building has been demolished. None of the chemicals detected in the soil samples from B29 exceeded screening levels. Therefore, no COPCs in the BLRA were identified at this former building.
- B65, Auxiliary Generator. This building has been demolished. None of the chemicals detected in the soil samples from B65 exceeded screening levels. Therefore, no COPCs in the BLRA were identified at this former building.
- Suspected Tetraethyl Lead Disposal Area (Sludge Disposal Area). None of the chemicals detected in the soil samples from this suspected disposal area exceeded screening levels. Therefore, no COPCs in the BLRA were identified at the suspected sludge disposal area.

The portion of the Industrial Complex Area south of Quillayute Road contained the following areas of potential sources (Figure 5):

- B4, Public Works Shop. During the March 2012 site visit, remnants of this building consisted of concrete columns and wood beams. The former building is located on a privately owned parcel that contains B6, B9, B119 and B119A. During the March 2012 site visit, the parcel was unoccupied and covered with heavy vegetation. The BLRA COPCs identified in the soil samples from B4 were pentachlorophenol and PAHs.
- B6, Fire Station. The building has been demolished; however, the foundation slab is still present and was surrounded by heavy vegetation during the March 2012 site visit. None of the chemicals detected in the soil samples from B6 exceeded screening levels. Therefore, no COPCs in the BLRA were identified.
- B9, Blacksmith. The building has been demolished and only the slab remains as of the March 2012 site visit. The BLRA COPCs identified in the soil samples from B9 were PAHs.
- B41, Boiler and Generator. Two 10,000-gallon underground storage tanks from the vicinity of this former building were closed in place by USACE in 2004. During the March 2012 site visit, remnants

of this building (consisting of brick walls) were observed. The BLRA COPCs identified in soil samples from B41 were PAHs.

- B44, Dry Cleaner. Dry cleaning equipment was present in this dry cleaning facility. B44 has been demolished; however, the foundation slab remains and is currently occupied by a mobile home. None of the chemicals detected in the soil samples from B44 exceeded screening levels. Therefore, no COPCs in the BLRA were identified.
- B49, Auxiliary Generator. This building housed a generator and was located next to the NI well (Figure 5). The footprint of this building is currently occupied by an unpaved driveway. The BLRA COPCs identified in soil samples from B49 were PAHs.
- B119 and B119A. These buildings were paint shops and have been demolished. As noted previously, the parcel containing these buildings is unoccupied and covered by heavy vegetation during the March 2012 site visit. None of the chemicals detected in the soil samples from B119 and B119A exceeded screening levels. Therefore, no COPCs in the BLRA were identified.
- E120, Fire Station. The building has been demolished and the footprint is currently unoccupied. None of the chemicals detected in the soil samples from E120 exceeded screening levels. Therefore, no COPCs in the BLRA were identified.

5.2 UNDERGROUND STORAGE TANK CLOSURE

All former underground storage tanks at the former NAAS Quillayute were identified based on historical drawings. The former underground storage tank sites were closed by USACE in 2004 in accordance with state regulations.

5.3 GROUNDWATER INVESTIGATION AREAS

Groundwater samples were collected during the RI in 2009, 2010, and 2011 from monitoring wells installed by USACE and residential wells located within the former NAAS Quillayute. The well locations are shown in Figure 6. If a chemical was detected in groundwater samples, the risk from exposure to this chemical was evaluated in a two-step process. First, the concentrations of the chemicals detected in the groundwater samples were compared against conservative screening levels from USEPA and WDOE. If the concentrations were below the screening levels, then there are no unacceptable risks from exposure to these detected chemicals and no further evaluation was performed. The second step of the risk evaluation process was performed when concentrations in the groundwater samples were greater than the screening levels. If the concentrations of a chemical in groundwater samples were greater than the screening levels, then the chemical is identified as a COPC and was further evaluated in the BLRA presented in Section 6. Table 5 summarizes the wells that were sampled, sampling dates, the chemicals that were analyzed for in the groundwater samples, and the chemicals that were identified as COPCs in the BLRA from each groundwater investigation area and well. Table 6 summarizes the range of concentrations for chemicals that were identified in groundwater.

Table 5. Summary of Remedial Investigation groundwater samples collected, analysis performed, and chemicals of potential concern from each Investigation Area and well

Well ID	Sampling Date	VOCs	SVOCs	PAHs	TOC	Silver	Other Metals	COPCs (USACE 2013)
Investigation Area 5								
MW-6	April 2009	✓	✓	✓	✓	--	✓	No chemicals above SLs
MW-7	March/April 2009	✓	✓	✓	✓	--	✓	No chemicals above SLs
MW-8	April 2009	✓	✓	✓	✓	--	✓	No chemicals above SLs
MW-10	March/April 2009	✓	✓	✓	✓	--	✓	No chemicals above SLs
B6	March/April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
B14	March 2009	✓	✓	✓	✓	✓	--	No compounds above SLs
B21	April 2009	✓	✓	✓	✓	--	✓	bis(2-ethylhexyl)phthalate
	November 2009	✓	✓	✓	✓	--	✓	
B24	March 2009	✓	✓	✓	✓	--	✓	No chemicals above SLs
B26	April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
Investigation Area 6								
MW-9	April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
MW-11	March/April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
MW-13	April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
Airport Well	March 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
Investigation Area 7								
MW-14	December 2010	✓	✓		✓	✓	--	No chemicals above SLs
	December 2011		✓	✓				
MW-15	December 2010	✓	✓		✓	✓	--	No chemicals above SLs
	December 2011		✓	✓				
MW-16	December 2010	✓	✓		✓	✓	--	Carbon tetrachloride
	December 2011		✓	✓				
P-12	March 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
P-13	March 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
P-17/P-18	April 2009	✓	✓	✓	✓	✓	--	No chemicals above SLs
Investigation Area 8								
MW-1	March 2009	✓	✓	✓	✓	✓	--	Carbon tetrachloride
MW-2	March/April 2009	✓	✓	✓	✓	✓	--	Carbon tetrachloride
MW-3	March/April 2009	✓	✓	✓	✓	✓	--	Carbon tetrachloride
MW-12	March/April 2009	✓	✓	✓	✓	✓	---	No compounds above SLs
MW-17	January 2011	✓	✓		✓	✓	---	Carbon tetrachloride
	December 2011		✓	✓				
NI Well	March 2009	✓	✓	✓		✓	--	Carbon tetrachloride
	December 2010	✓						
NNW	December 2011	✓	✓	✓	✓	✓	--	No chemicals above SLs
Pond south of NI	November 2009	✓	--	--	--	--	--	No chemicals above SLs

COPC: chemical of potential concern, PAH: polycyclic aromatic hydrocarbon; SLs: screening levels; SVOC: semi-volatile organic compound; TOC: total organic carbon; VOC: volatile organic compound

Table 6. Range of detections from the BLRA chemicals of potential concern in each groundwater Investigation Area and the location of the maximum detection

Chemical of Potential Concern	Investigation Area 5	Investigation Area 6	Investigation Area 7	Investigation Area 8
bis(2-ethylhexyl)phthalate	0.2 to 24 µg/L (B-21)	Not detected above SLs	Not detected above SLs	Not detected above SLs
Carbon tetrachloride	--	--	0.59 to 0.62 µg/L (MW-16)	0.12 to 6.8 µg/L (NI Well)

Note: Location of maximum detection shown in parenthesis for each Investigation Area.

SL: screening levels; µg/L: micrograms per liter

5.3.1 West Parcels Groundwater (Investigation Area 5)

This groundwater investigation area is shown on Figure 6 and contains wells MW-6, MW-7, MW-8, MW-10, B-6, B-14, B-21, B-24, and B-26. These wells are mostly located in the West Parcels Area but include MW-10 and MW-7 (Administration and Operations Area), and MW-8 (East Parcels Area). The only chemical that was detected in groundwater samples at concentrations greater than screening levels for Investigation Area 5 was bis(2-ethylhexyl)phthalate. This chemical was identified as a BLRA COPC and risks were evaluated.

5.3.2 Quillayute Airport Groundwater (Investigation Area 6)

This groundwater investigation area is shown on Figure 6 and contains wells MW-9, MW-11, MW-13, and a well designated “Airport”. All of the wells are within Quillayute Airport. None of the concentrations for chemicals detected in groundwater samples from Investigation Area 6 were greater than screening levels. Therefore, no COPCs were identified in the BLRA and no further evaluation of risk was required.

5.3.3 Vicinity of B44 Groundwater (Investigation Area 7)

This groundwater investigation area is shown on Figure 6 and contains wells MW-14, MW-15, MW-16, P-12a, P-13, and P-17/18. The only chemical that was detected in groundwater samples at concentrations greater than screening levels for Investigation Area 7 was carbon tetrachloride. This chemical was identified as a BLRA COPC and risks from exposure to this chemical in groundwater were evaluated.

5.3.4 Vicinity of the NI Well Groundwater (Investigation Area 8)

This groundwater investigation area is shown on Figure 6 and contains wells MW-1, MW-2, MW-3, MW-12, MW-17 and the wells designated as “NNW” and “NI”. The portion of the Industrial Complex Area south of Quillayute Road contained two former DoD wells; these wells are shown in Figure 5 and are designated as the ‘NI well’⁴ and ‘ST well’⁵. The NI well was being used to supply water to a residence until early 2011 when a new well was installed by the parcel owner (well labeled ‘NNW’). The ST well has never been sampled due to inaccessibility and it does not appear to be in use.

The only chemical that was detected in groundwater samples at concentrations greater than screening levels for Investigation Area 8 was carbon tetrachloride. This chemical was identified as a BLRA COPC and risks were evaluated.

5.4 VAPOR INTRUSION INVESTIGATION AREAS

Vapor intrusion occurs when there is migration of volatile chemicals from contaminated groundwater or soil into an overlying building. The potential for vapor intrusion was evaluated in the vicinity of the concrete

⁴ The NI well is referred to as the ‘Nielsen well’ and the ‘Pumphouse No. 1’ well in some investigation reports.

⁵ The ST well is referred to as the ‘Stout well’ in some investigation reports.

slab that was the foundation for B44, the Dry Cleaner building at former NAAS Quillayute. Vapor intrusion was evaluated in the vicinity of the NI well. These locations were investigated for vapor intrusion because volatile chemicals had been detected in groundwater samples from the NI well and from monitoring MW-16 located next to the B44 slab (Figure 7).

To evaluate vapor intrusion in the vicinity of the B44 slab and the NI well, **soil gas** samples were collected by installing probes into soil borings and extracting air from the soil. Air samples were collected from the crawl space underneath the mobile home that occupies the former B44 slab. Indoor air samples from the mobile home were not collected because the homeowner did not grant permission to access the residence. Ambient air samples were collected outdoors and were used to determine the ‘background concentration’ of the area.

Chemicals that were detected in the ambient air, crawl space, and soil gas samples were compared against conservative screening levels from USEPA. If concentrations for a chemical were greater than the screening level, then the chemical was identified as a BLRA COPC and risks were evaluated. A summary of chemicals detected and COPCs in vapor intrusion samples are shown in Table 7. Table 8 summarizes the range of detections for each chemical.

Table 7. Summary of remedial investigation vapor intrusion samples collected, chemicals detected, and BLRA COPCs for each investigation area

Air Sample Location/Type	Sampling Date	Chemical Detected	Chemical of Potential Concern (USACE 2013)
Investigation Area 9			
Ambient Air	November 2010 December 2011	1,1,1-trichloroethane, 1,2-Dichloroethane, Benzene, Carbon Tetrachloride, Ethylbenzene, m,p-Xylene, Methylene Chloride, o-Xylene, Tetrachloroethene, Toluene	1,2-dichloroethane, benzene
Crawl Space Air	November 2010 December 2011	1,1,1-trichloroethane, 1,1,2,2-Tetrachloroethane, 1,2-Dichloroethane, Benzene, Carbon Tetrachloride, Ethylbenzene, m,p-Xylene, Methylene Chloride, o-Xylene, Tetrachloroethene, Toluene	1,2-dichloroethane, benzene
Soil Gas	November 2010	Benzene, Carbon Tetrachloride, Ethylbenzene, m,p-Xylene, o-Xylene, Tetrachloroethene, Toluene, Trichloroethene, Vinyl Chloride	carbon tetrachloride, tetrachloroethene
Investigation Area 10			
Soil Gas	December 2011	1,1,1-trichloroethane, 1,1,2,2-Tetrachloroethane, 1,2-Dichloroethane, Benzene, Carbon Tetrachloride, Ethylbenzene, m,p-Xylene, Methylene Chloride, o-Xylene, Tetrachloroethene, Toluene, Trichloroethene, Vinyl Chloride	None

Table 8. Range of detections of BLRA COPCs for vapor intrusion

Chemical of Potential Concern	Ambient Air	Crawl Space Air	Soil Gas
1,2-dichloroethane	0.14 µg/m ³ (single detection)	0.12 to 0.13 µg/m ³	--
benzene	0.42 µg/m ³ (single detection)	0.34 to 0.37 µg/m ³	--
carbon tetrachloride	--	--	18 to 1900 µg/m ³
tetrachloride	--	--	7.2 to 1800 µg/m ³

5.4.1 Vicinity of the B44 slab (Investigation Area 9)

The samples that were collected to evaluate vapor intrusion in the vicinity of the B44 slab includes two ambient air samples collected 50 feet from the B44 slab, two crawl space air samples (same location), and six soil gas samples from 3 depths at 2 soil gas probe locations. The sampling locations are shown in Figure

7. Chemicals that were detected in the vapor intrusion samples at concentrations greater than screening levels were: 1,2-dichloroethane, benzene, carbon tetrachloride, and tetrachloroethene. These chemicals were identified as vapor intrusion BLRA COPCs for this investigation area and risks were evaluated.

5.4.2 Vicinity of the NI well (Investigation Area 10)

The samples that were collected to evaluate vapor intrusion in the vicinity of the NI well includes 2 soil gas samples from two soil gas probe locations, one near the NI well and one near the residence located closest to the NI well (near the B33 slab). The vapor intrusion sample locations are shown in Figure 7. None of the chemicals detected in the vapor intrusion samples were greater than screening levels. Therefore, no COPCs in the BLRA were identified and no further evaluation of risk was required.

6.0 SUMMARY OF RISK

Both cancer and non-cancer risks were calculated in the human health risk assessment in the BLRA. A **Baseline Ecological Risk Assessment (BERA)** also was completed in the BLRA.

6.1 HUMAN HEALTH RISK ASSESSMENT

Baseline risk is an estimate of the likelihood of health problems occurring without cleanup. Information on the concentration of chemicals found at the site is combined with ways that people might be exposed to the chemicals and used to determine cancer or non-cancer risks. Cancer risks are defined as **Incremental Lifetime Cancer Risks (ILCRs)** which represent the additional probability that a person may develop cancer as a result of exposure to these chemicals at the site. These risks are reported as numerical probabilities (e.g., a 2×10^{-4} for a 2 in 10,000 increase in the chance of a person getting cancer as a result of chemical exposure). Non-cancer risks are derived by calculating a **Hazard Index (HI)**. An HI of 1 or less indicates that adverse non-cancer health effects are considered unlikely while an HI greater than 1 indicates that adverse health effects may occur.

The BLRA was completed in 2013 and included the **Baseline Human Health Risk Assessment (BHHRA)**. The BHHRA evaluated risks and hazards to people at the site from exposure to residual contamination at the site under baseline conditions (no cleanup). Chemicals with concentrations that were greater than screening levels in soil, groundwater, and vapor intrusion samples were identified as COPCs. Risks from exposure to the COPCs in soil, groundwater, or via vapor intrusion were calculated using standard methods provided by USEPA for conducting risk assessments.

The estimated risks were compared to the USEPA “acceptable” risk levels of 1 in 10,000 (10^{-4}) to 1 in 1,000,000 (10^{-6}).

6.1.1 Soils BLRA Results

The chemicals that were identified as COPCs in soil were: benzo(a)pyrene and other carcinogenic PAHs, pentachlorophenol and naphthalene. Based on current land use and Clallam County zoning laws, the people who use the site may include indoor and outdoor workers (i.e., airport maintenance and operators), excavation/construction workers, visitors/recreationists, and residents. The estimated cancer risks are reported in Table 9.

The BHHRA results show that cancer risks for people are within or below the acceptable risk range of 10^{-4} and 10^{-6} from exposure to soil. The highest risk (1×10^{-5}) was calculated for residents exposed to soil at B5 (former Transportation Maintenance Building) but estimated risks are lower for other people at B5 (including indoor and outdoor workers, visitors, excavation/construction workers). Risks associated with

soils from the other former buildings at the site are below WDOE target risk of 10^{-5} . All of the HIs associated with exposure to soil were below 1 as shown in Table 10.

Table 9. Incremental lifetime carcinogenic risks for site receptors from exposure to COPCs in soil

Area of Potential Sources	Indoor Worker	Outdoor Worker	Excavation/ Construction Worker	Visitor/ Recreationist Child	Visitor/ Recreationist Adult	Resident Child	Resident Adult
Investigation Area 2							
B101 and B102, Radio and Generator Building	7.E-08	2.E-07	1.E-08	4.E-07	5.E-07	3.E-06	4.E-06
Investigation Area 4							
B4, Public Works Shop	1.E-07	6.E-07	3.E-08	7.E-07	1.E-06	5.E-06	6.E-06
B5, Transportation Maintenance	4.E-07	1.E-06	6.E-08	1.E-06	2.E-06	1.E-05	1.E-05
B9, Blacksmith	6.E-08	2.E-07	1.E-08	4.E-07	4.E-07	3.E-06	3.E-06
B10, Gunnery Training	3.E-08	1.E-07	6.E-09	2.E-07	2.E-07	2.E-06	2.E-06
B11 and B7, Radio and Radar Building/Transformer Vault	9.E-08	9.E-08	5.E-09	2.E-07	2.E-07	1.E-06	1.E-06
B12, Class "C" Overhaul Shop	9.E-09	3.E-08	2.E-09	6.E-08	7.E-08	4.E-07	5.E-07
B17, Wash rack and shelter	2.E-07	9.E-07	4.E-08	6.E-07	8.E-07	4.E-06	6.E-06
B20, Hangar	2.E-07	9.E-07	4.E-08	1.E-06	2.E-06	7.E-06	9.E-06
B41, Boiler and Generator	8.E-08	3.E-07	1.E-08	5.E-07	6.E-07	4.E-06	5.E-06
B49, Auxiliary Generator Building	6.E-08	2.E-07	1.E-08	4.E-07	4.E-07	3.E-06	3.E-06

Table 10. Hazard indices for site receptors from exposure to COPCs in soil

Area of Potential Sources	Outdoor Worker	Excavation/ Construction Worker	Visitor/ Recreationist Child	Visitor/ Recreationist Adult	Resident Child	Resident Adult
Investigation Area 2						
B101 and B102, Radio and Generator Building	--	--	--	--	--	--
Investigation Area 4						
B4, Public Works Shop	0.0003	0.0003	0.0004	0.0001	0.002	0.0007
B5, Transportation Maintenance	0.001	0.09	0.001	0.0004	0.009	0.005
B17, Wash rack and shelter	0.001	0.001	0.001	0.0004	0.003	0.009
B20, Hangar	0.0006	0.0007	0.0008	0.0003	0.005	0.002

6.1.2 Groundwater BLRA Results

The chemicals that were identified as BLRA COPCs in groundwater were bis(2-ethylhexyl)phthalate and carbon tetrachloride. Risks and hazards from exposure to groundwater were calculated for groundwater underlying the West Parcels Area (Investigation Area 5), the vicinity of the B44 slab within the Industrial Complex Area (Investigation Area 7), and the vicinity of the NI well within the Industrial Complex Area (Investigation Area 8). No COPCs were identified for groundwater underlying the Quillayute Airport portion of the Industrial Complex Area (Investigation Area 6).

In Investigation Area 5, the only COPC based on groundwater data collected during the RI is bis(2-ethylhexyl)phthalate and the estimated risks from exposure to this chemical in groundwater are below 10^{-6} (Table 11). Estimated risks from exposure to groundwater in Investigation Area 7 and Investigation Area 8 are below or within the acceptable risk range of 10^{-4} to 10^{-6} , and are below the WDOE target risk of 10^{-5} . The only chemical contributing to risk is carbon tetrachloride. All of the HIs associated with exposure to groundwater were below 1 as shown in Table 12.

Table 11. Incremental Lifetime Cancer Risks for site receptors from exposure to BLRA COPCs in groundwater

Area of Potential Concern and location of maximum detection	Outdoor Worker	Excavation/ Construction Worker	Visitor/ Recreationist Child	Visitor/ Recreationist Adult	Resident Child	Resident Adult
Investigation Area 5 (B-21)	1E-7	--	--	--	1E-7	3E-7
Investigation Area 7 (MW-16)	2E-7	4E-9	3E-8	7E-8	4E-7	2E-6
Investigation Area 8 (NI Well)	1E-6	2E-8	1E-7	3E-7	2E-6	7E-6

Table 12. Hazard indices for site receptors from exposure to BLRA COPCs in groundwater

Area of Potential Concern and location of maximum detection	Outdoor Worker	Excavation/ Construction Worker	Visitor/ Recreationist Child	Visitor/ Recreationist Adult	Resident Child	Resident Adult
Investigation Area 5 (B-21)	--	--	--	--	0.004	0.002
Investigation Area 7 (MW-16)	0.002	0.0004	0.001	0.0006	0.02	0.01
Investigation Area 8 (NI Well)	0.01	0.002	0.005	0.003	0.07	0.04

6.1.3 Vapor Intrusion BLRA Results

Chemicals that were detected at concentrations greater than screening levels in the vapor intrusion samples from the vicinity of the B44 slab were identified as COPCs in the BLRA. To further evaluate risks from exposure to these chemicals through vapor intrusion, risks were estimated using standard methods from USEPA for conducting vapor intrusion risk assessments.

The estimated risks from vapor intrusion based on the crawl space data were below the acceptable risk range of 10^{-4} to 10^{-6} for the resident child, and the estimated risks for the resident adult were within the acceptable risk range (Table 13). Risks from vapor intrusion estimated from the soil gas data were higher than the estimated risks from the crawl space air concentrations. The calculated HI values from vapor intrusion are below 1 based on the crawl space air concentrations, however the HI values are greater than 1 based on the soil gas data (Table 14). For the current conditions at the B44 slab, the risks and hazards estimated from the crawl space data are more relevant than the risks and hazards from the soil gas data because the crawl space data represent conditions closest to indoor air in the mobile home. The risks and hazards from the soil gas data may be more appropriate to consider for a potential future scenario of a residence with a basement, see Footnote 1 in Table 14.

The concentrations of chemicals in the crawl space air sample were similar to the concentrations of these chemicals in the ambient/outdoor/background air sample collected during the same sampling event. This observation suggests that the chemicals in these air samples may be from sources other than vapor intrusion from the soil, such as household cleaners.

Table 13. Incremental lifetime cancer risks for site receptors from exposure to BLRA COPCs through vapor intrusion in Investigation Area 9

Location for Vapor Intrusion Risk Estimate	Resident Child	Resident Adult
Crawl Space	7E-7	4E-6
Ambient Air	7E-7	4E-6
Soil gas (6 feet below ground surface)	4E-5	2E-4
Soil gas (6 to 18 feet below ground surface)	2E-4	9E-4

Table 14. Hazard indices for site receptors from exposure to BLRA COPCs through vapor intrusion in Investigation Area 10

Location for Vapor Intrusion Hazard Estimate	Resident Child	Resident Adult
Crawl Space	0.02	0.02
Ambient Air	0.02	0.02
Soil gas (6 feet below ground surface) ⁶	3	3
Soil gas (6 to 18 feet below ground surface) ⁸	9	9

6.2 ECOLOGICAL RISK ASSESSMENT

The BERA included a literature survey of sensitive wildlife species that may be present at the site as well as a site visit in March 2012 during which species and habitats within the site were observed and documented. The literature survey reviewed indicated the potential presence of sensitive wildlife species. However, none of these species or their habitats was observed during the site visit.

The BERA evaluated risks and hazards to site wildlife from exposure to contaminants at the site. Chemical analysis of soil and groundwater samples collected during the RI activities from March 2009 through December 2011 (Table 4) were compared to ecological screening levels from USEPA and WDOE to identify **Chemicals of Potential Ecological Concern (COPECs)**. Because none of the chemicals in the soil samples were detected at concentrations greater than the ecological screening levels, no COPECs were identified.

Based on the information gathered during the RI and the subsequent BERA evaluation, the contamination levels do not pose unacceptable risks to wildlife and the environment.

6.3 SUMMARY OF RISK ASSESSMENT

The USACE found no unacceptable risks to people’s health or to the environment from past DoD activities at the site. Risk assessment results show that all risks and hazards are within or below acceptable values for all of the investigation areas and for vapor intrusion based on current land use.

Since there are potential unacceptable risks from soil gas for a future scenario, USACE will follow the Department of Defense Manual 4715.20 directive for properties where no existing structures overlay a potential vapor intrusion pathway. USACE will document the potential vapor intrusion risk and provide notice of this potential risk to the affected non-DoD property owner in writing. A copy of this notice will be included in the Decision Document. The non-DoD property owner will be responsible for addressing this potential risk in any future structures constructed on the site by adding appropriate mitigating measures or demonstrating there is no unacceptable risk under applicable law.

Based on the RI and a review of available data, no remedial action is necessary to ensure protection of human health and the environment. The USACE proposes no action under CERCLA for the NAAS Quillayute site.

The USACE is the lead federal agency and the WDOE is the lead regulatory agency. WDOE concurs with the assessment and the USACE’s recommendation for no action.

⁶ The crawl space data are considered more representative of current conditions. For a potential future scenario of a residence with a basement USACE will provide a notice of potential vapor intrusion risks to the affected non-DoD property owners and include the notice in the Decision Document in order to inform property owners of the potential future risk of installing structures over a potential vapor intrusion pathway.

7.0 COMMUNITY PARTICIPATION

7.1 PUBLIC COMMENT PERIOD

A public comment period is from April 22, 2016 through May 27, 2016. The purpose of the comment period is to offer the public and other stakeholders the opportunity to review and comment on the Proposed Plan. A final decision will not be made until comments received during the public comment period have been evaluated. Comments received will be included in the Administrative Record File and summarized in the Responsiveness Summary section of the Decision Document, the document which formalizes the selection of the final decision. Any interested party may submit comments in writing on the Proposed Plan. Comments must be postmarked no later than May 28, 2016.

All written comments should be sent to Mr. Mirek Towster:

Mr. Mirek Towster
U.S. Army Corps of Engineers, Kansas City District
635 Federal Building (CENWK-PM-ED)
601 E. 12th Street
Kansas City, Missouri 64106-2896

Based on public comments or new information, USACE, with consultation with WDOE, may decide to modify the no remedial action recommendation. Therefore, it is important to comment on the Proposed Plan. USACE will respond to comments received in the Responsiveness Summary section of the Decision Document, which will be placed in the Administrative Record File at the Forks Branch Library.

7.2 PUBLIC MEETING

The USACE and WDOE will consider the views and comments of the public before making a decision on the remedial actions.

Holding a public meeting is one way for interested parties to share their views and comments about the Proposed Plan. All interested individuals are encouraged to attend a public meeting scheduled at the Rainforest Arts Center, 35 N. Forks Avenue, Forks, WA 98331. The USACE representatives will be present. A court reporter will be present to record the meeting. The meeting will be held on May 25, 2016 starting at 6:30 pm.

If you have any questions about USACE's Proposed Plan or the public comment period, please contact the following USACE or WDOE personnel:

Mr. Mirek Towster
U.S. Army Corps of Engineers, Kansas City District
635 Federal Building (CENWK-PM-ED)
601 E. 12th Street
Kansas City, Missouri 64106-2824

Ms. Sandra Caldwell
Washington State Department of Ecology
Toxics Cleanup Program
300 Desmond Drive SE, Lacey
PO Box 47600
Olympia, Washington 98504-7600

The Administrative Record File has been established at the following location:

Forks Branch Library
171 South Forks Avenue
Forks, Washington 98331
360-374-6402

The Administrative Record File contains reports, and other material used in preparation of this Proposed Plan. The Library is open as shown, and is subject to change. Hours available online at:

<http://www.nols.org/locations-hours/forks.html>:

Monday through Thursday
10:00 am to 7:00 pm

Friday and Saturday
10:00 am to 6:00 pm

Sunday
Closed

8.0 GLOSSARY OF TERMS

This glossary defines the technical terms used in this Proposed Plan. These terms and abbreviations contained in this glossary are often defined in the context of hazardous waste management, and apply specifically to work performed under the CERCLA. Therefore, these terms may have other meanings when used in a different context.

Administrative Record File: The body of documents that forms the basis for selection of a particular response at a site.

Baseline Ecological Risk Assessment: The portion of a BLRA that addresses risks to ecological receptors.

Baseline Human Health Risk Assessment: The portion of a BLRA that addresses risks to human health

Baseline Risk Assessment (BLRA): A study of the actual or potential danger to human health or the environment from hazardous substances at a specific site. The study includes a human health and an ecological risk component. The BLRA estimates risks at the site as it currently exists, with no remedial action taken.

Chemical of Potential Concern (COPC): A chemical detected at the site that represent those contaminants posing the greatest potential human health risks at the site due to their inherent toxicity or prevalence at the site. A COPC is defined as a chemical that exceeded a screening level and was carried forward into the risk assessment.

Contaminants of Potential Ecological Concern (COPECs): A subset of all the chemicals detected at the site that represent those contaminants posing the greatest potential risk to the environment at the site due to their inherent toxicity or prevalence at the site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): CERCLA is also referred to as “**Superfund.**” A federal law that addresses the discharge and remediation of hazardous substances, pollutants, and contaminants into the environment. It provides for a structured remedial system, makes any entity that had a role in the contamination liable for the cleanup, arranges for the funding of

abandoned sites, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Decision Document: The document in which USACE selects a remedy when site is not on the National Priority List.

Groundwater: Water found beneath the ground surface that fills pores between materials such as sand, silt, gravel, or rock which is often used as a source of drinking water via municipal or domestic wells.

Hazard Index (HI): A numerical representation of the health hazard, unrelated to cancer, posed by contaminants through one or more exposure pathways. An HI value of 1 is similar in concept to a “threshold value” for non-cancer toxicity. An HI value less than 1 indicates the lack of any non-cancer hazard, while a value greater than 1 indicates a potential health concern.

Incremental Lifetime Cancer Risk (ILCR): Incremental probability of an individual developing cancer as a result of potential carcinogen exposure averaged over a lifetime.

Metals: Chemical elements such as iron and aluminum generally characterized by ductility, malleability, luster, and conductivity of heat and electricity. Metals naturally exist in soils.

Polychlorinated Biphenyls (PCBs): A synthetic organic chemical compound of chlorine attached to biphenyl (a molecule composed of two benzene rings).

Polycyclic Aromatic Hydrocarbons (PAHs): An organic compound that occurs in oil, coal, and tar deposits and is produced as byproducts of burning fuel.

Remedial: An adjective describing the course of study combined with actions to correct site

contamination problems through identifying the nature and extent of cleanup strategies under the Superfund program.

Remedial Investigation (RI): A study that determines how much and what kind of contamination exists at a site. A RI generally involves collecting and analyzing samples of groundwater, surface water, soil, sediment, and air.

Responsiveness Summary: A portion of the Decision Document in which public comments are summarized and responses to comments are made. The responsiveness summary addresses public comments on the Proposed Plan and other documents.

Semi-volatile Organic Compounds (SVOC): A group of organic compounds that have a tendency to change from liquids to gases as relatively low temperatures, higher than ambient temperatures.

Soil Gas: Gas occurring in the unsaturated soil pore spaces.

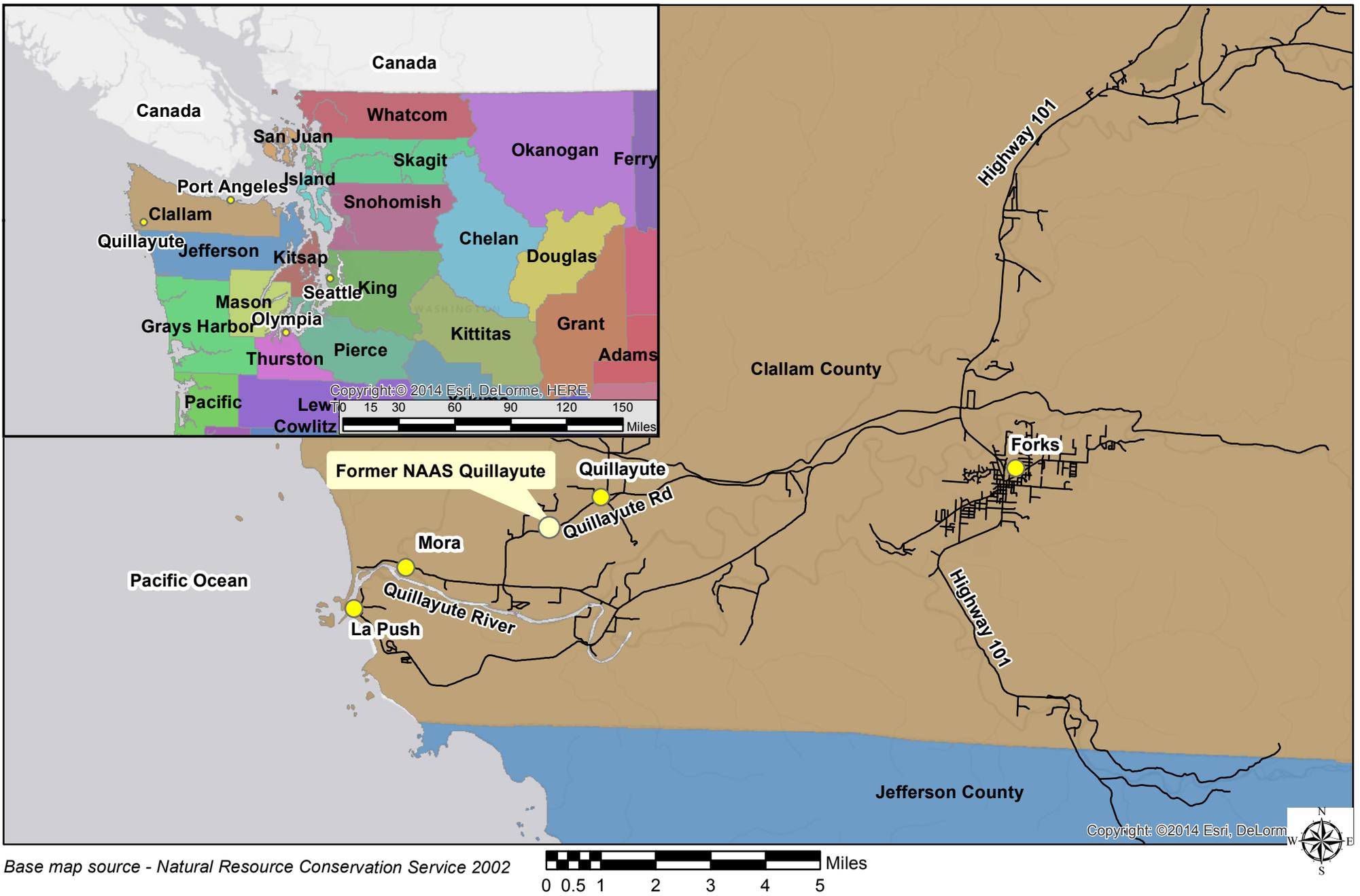
Superfund: The common name given to CERCLA (see above).

Vapor Intrusion: The migration of volatile chemicals from contaminated groundwater or soil into an overlying building.

Volatile Organic Compounds (VOCs): A group of organic compounds that have a tendency to change from liquids to gases at ambient temperatures and pressures.

9.0 LIST OF ACRONYMS AND ABBREVIATIONS

BERA	Baseline Ecological Risk Assessment
BHHRA	Baseline Human Health Risk Assessment
BLRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Chemical of Potential Concern
COPEC	contaminant of potential ecological concern
DERP	Defense Environmental Restoration Program
DoD	U.S. Department of Defense
°F	degrees Fahrenheit
FUDS	Formerly Used Defense Sites
HI	Hazard Index
HTRW	Hazardous, Toxic and Radioactive Waste
ILCR	Incremental Lifetime Cancer Risk
NAAS	Naval Auxiliary Air Station
NCP	National Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
PAH	polycyclic aromatic hydrocarbon
PCB	poly-chlorinated biphenyl
RCRA	Resource Conservation Recovery Act
RI	Remedial Investigation
SL	Screening Level
SVOC	semi-volatile organic compound
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WDOE	Washington Department of Ecology
µg/kg	micrograms per kilogram
µg/L	micrograms per liter



Base map source - Natural Resource Conservation Service 2002



U.S. Army Corps of Engineers

Figure 1. Location of Former NAAS Quillayute in Clallam County, Washington

**Former Naval Auxiliary Air Station Quillayute
Quillayute, Washington**

F10WA012102_04.10_0500_a

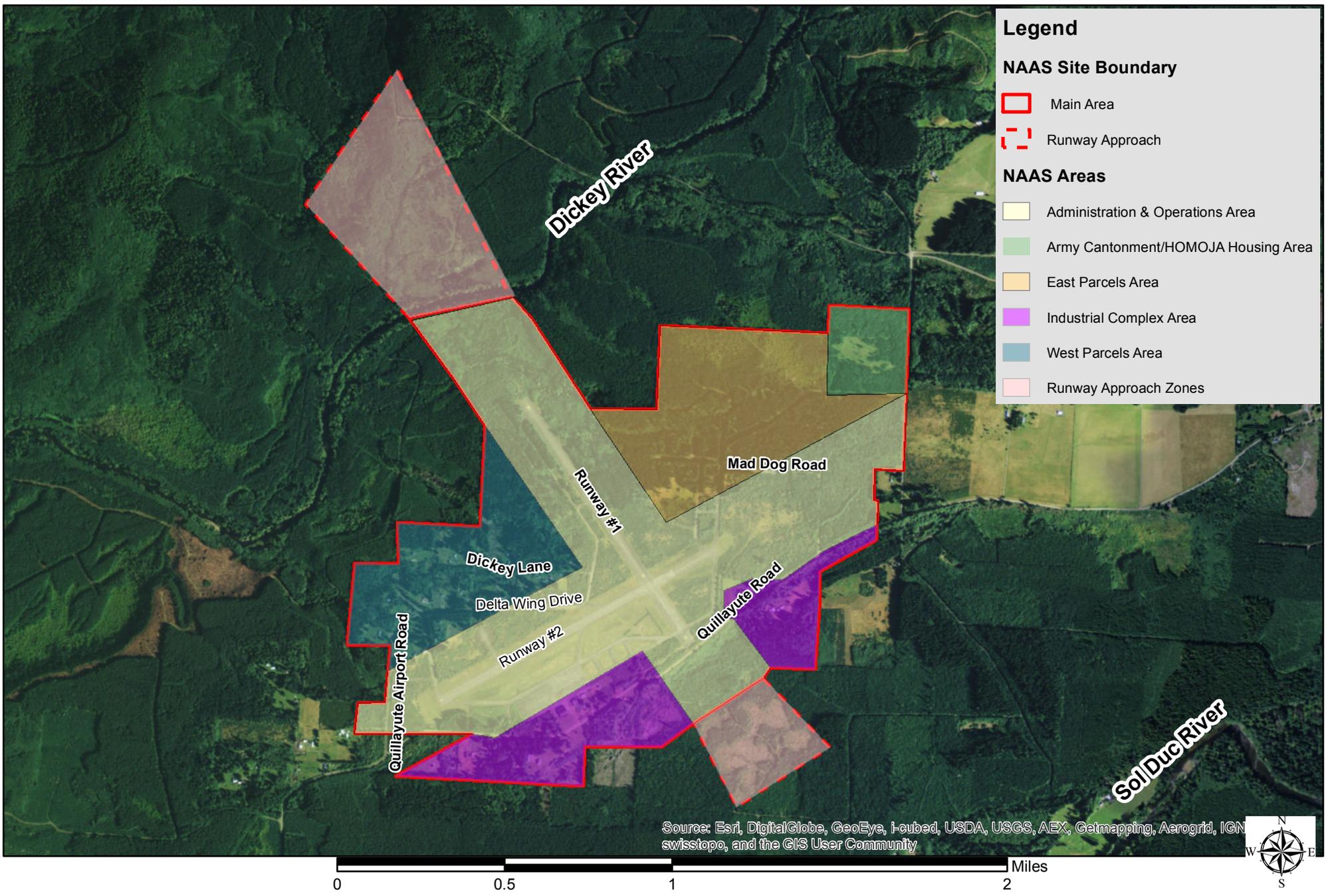


Figure 2. Former NAAS Quillayute areas

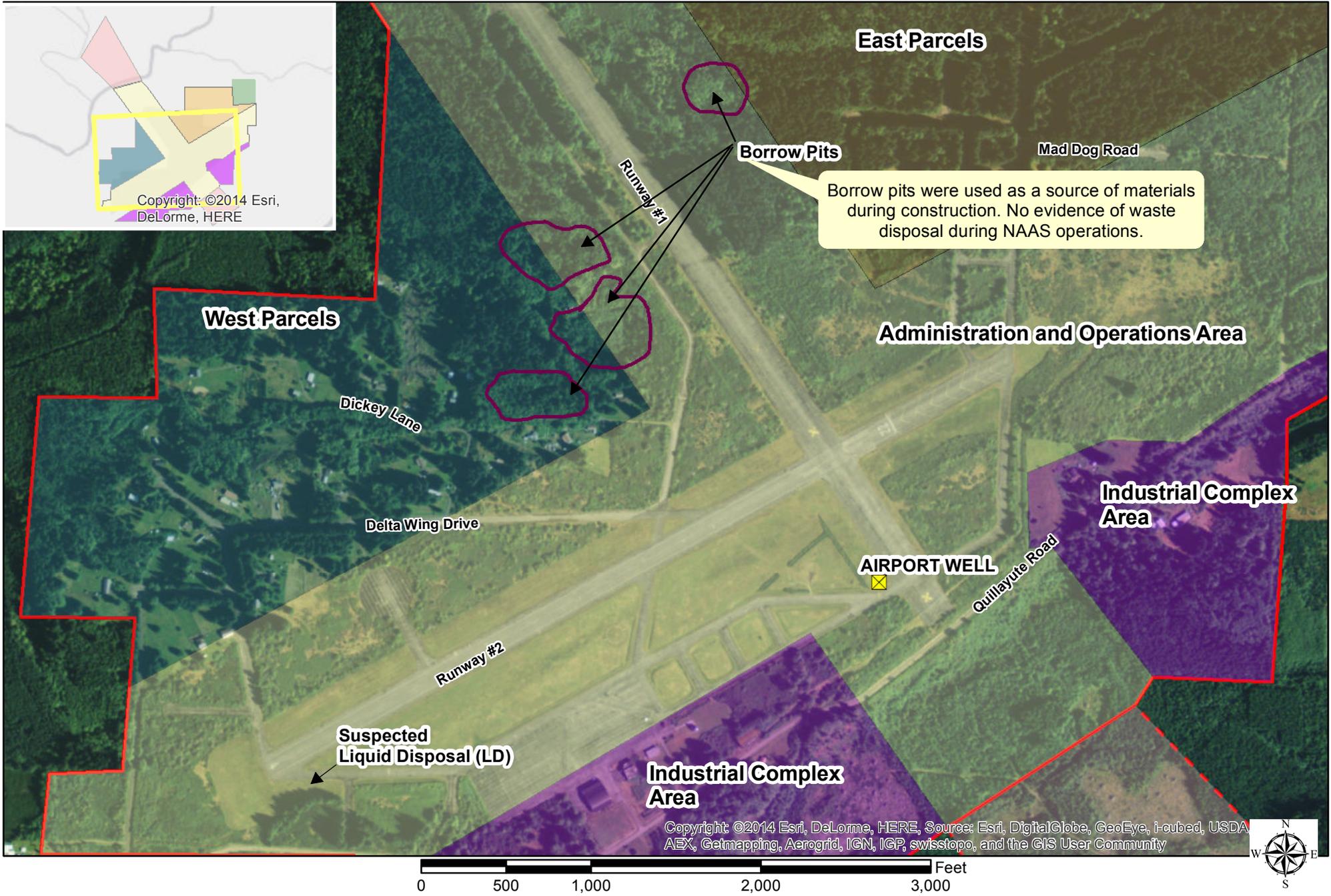


Figure 3. Site features and areas of potential concern in the Administration and Operations Area (Investigation Area 1) and West Parcels Area

**Former Naval Auxillary Air Station Quillayute
Quillayute, Washington**

200-1e / 1200C PERM
F10WA012102_04.10_0500_a

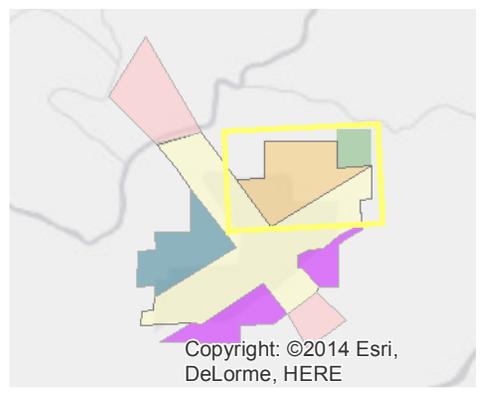


Figure 4. Site features and areas of potential concern in the East Parcels Area (Investigation Area 2)

Former Naval Auxillary Air Station Quillayute
Quillayute, Washington
200-1e / 1200C PERM
F10WA012102_04.10_0500_a

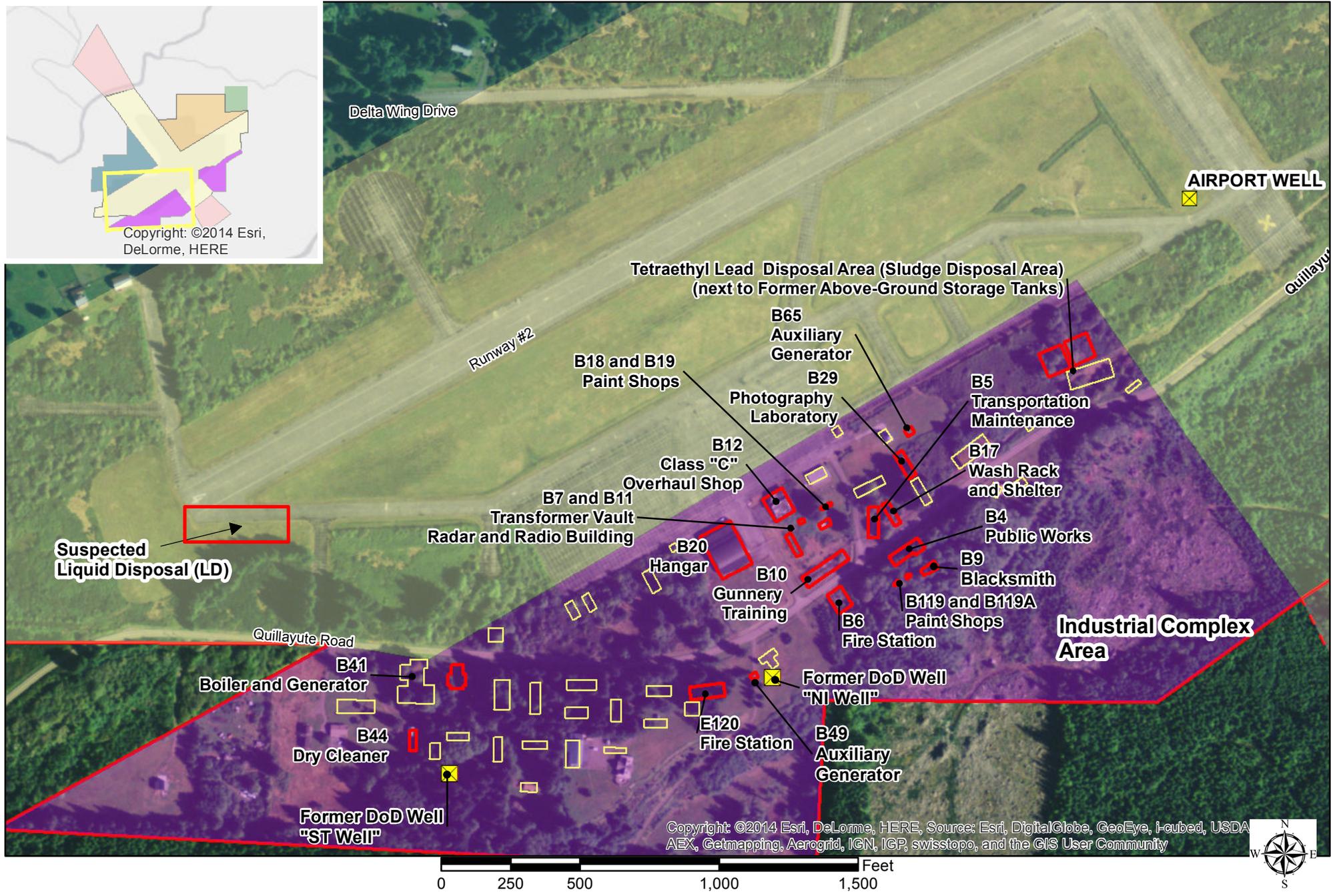
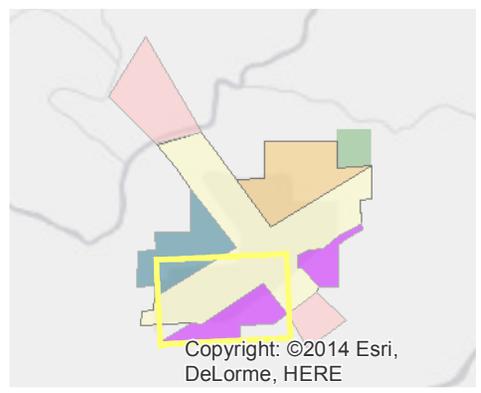
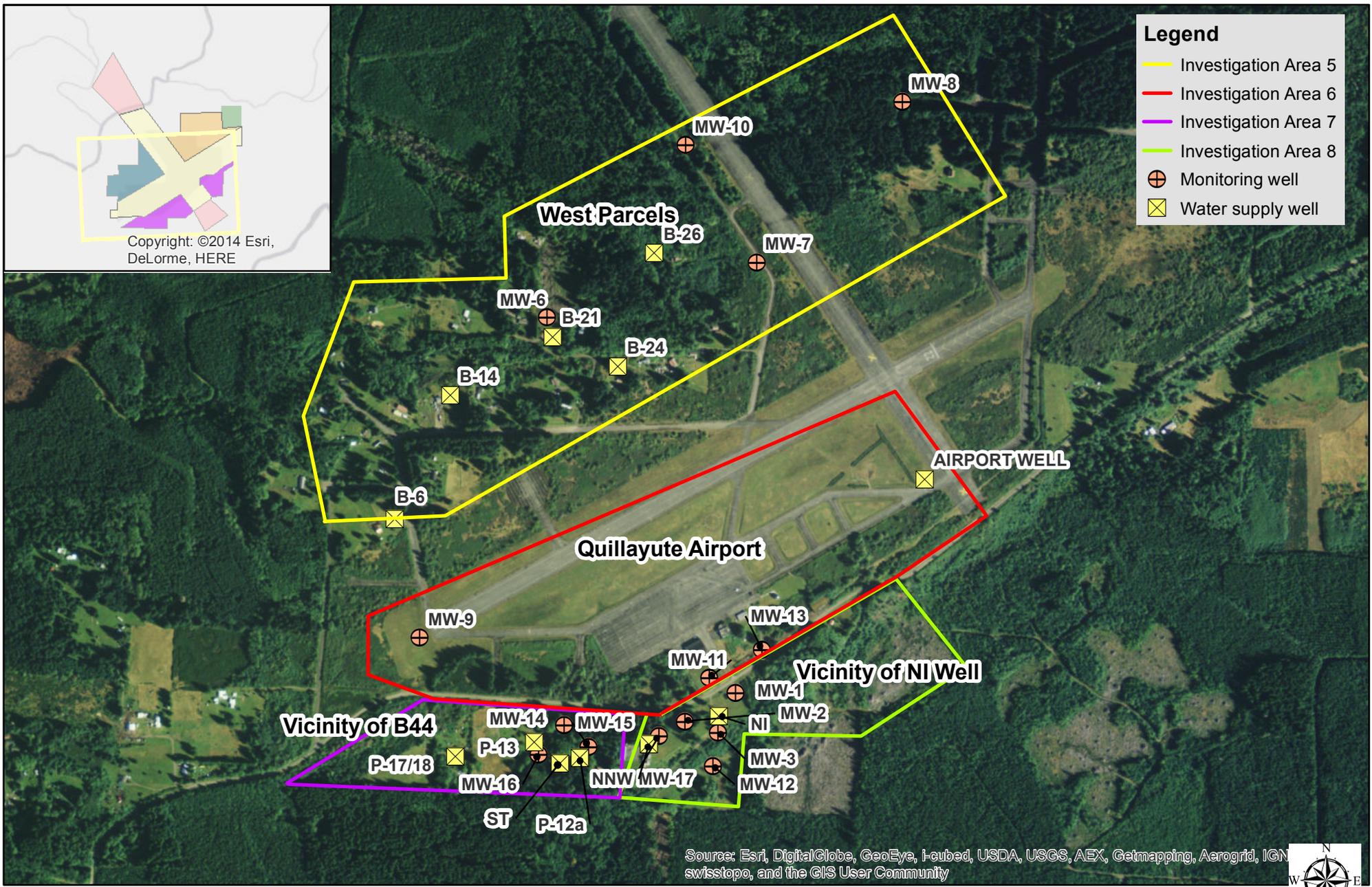
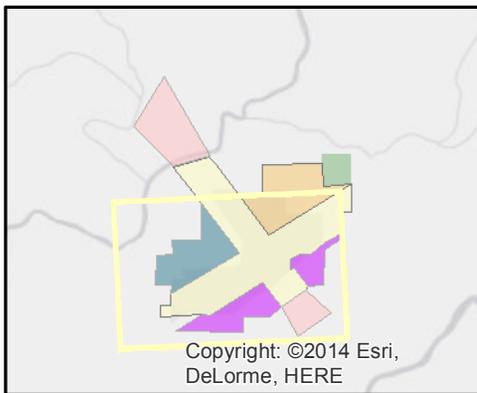


Figure 5. Site features and area of potential concern in the Industrial Complex Area (Investigation Area 3)

Former Naval Auxillary Air Station Quillayute
Quillayute, Washington

200-1e # 1200C PERM
F10WA012102_04.10_0500_a

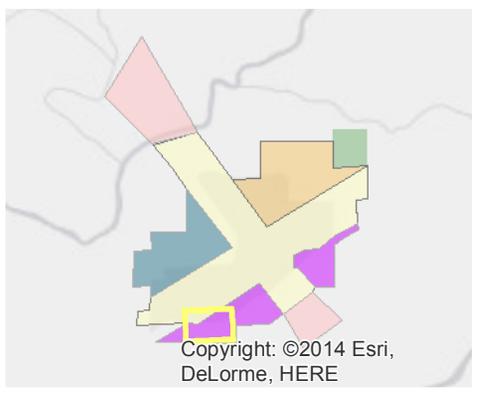


U.S. Army Corps of Engineers

Figure 6. Groundwater investigation areas

Former Naval Auxillary
Air Station Quillayute
Quillayute, Washington

200-1e / 1200C PERM
F10WA012102_04.10_0500_a



Legend

- Soil gas probe
- Ambient Air
- Crawl Space

Wells

- Monitoring well
- Water supply well



Copyright: ©2014 Esri, DeLorme, HERE, Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Figure 7. Vapor intrusion sample locations

**Former Naval Auxillary
Air Station Quillayute
Quillayute, Washington**
200-1e / 1200C PERM
F10WA012102_04.10_0500_a

