

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action Environmental Indicator (EI) RCRAInfo code (CA725)

Current Human Exposures Under Control

Facility Name: NWIRP Calverton
Facility Address: Grumman Boulevard, Calverton NY 11933
Facility EPA ID#: NYD003995198

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated unites (RU), and Areas of Concern (AOC), been considered in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EIs developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e.,

RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be “contaminated”¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	—	—	<u>See Rationale and Reference. Below</u>
Air (indoors) ²	—	<u>X</u>	—	<u>No impact from facility releases</u>
Surface Soil (e.g., <2 ft)	<u>X</u>	—	—	<u>See Rationale and Reference. Below</u>
Surface Water	—	<u>X</u>	—	<u>VOCs are present at low concentrations</u>
Sediment	—	<u>X</u>	—	<u>See Rationale and Reference. Below</u>
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	—	—	<u>See Rationale and Reference. Below</u>
Air (outdoors)	—	<u>X</u>	—	<u>No impact from facility releases.</u>

_____ If no (for all media) - skip to #6, and enter “YE”, status code after providing or citing appropriate “levels”, and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter “IN” status code.

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Rationale and Reference(s)

SITE DESCRIPTION

Location

NWIRP-Calverton is located in Suffolk County on Long Island, New York, approximately 70 miles from New York City. The facility covers approximately 6,000 acres, 3,000 of which are enclosed by a fence. The site location is shown as Figure 1. A portion of the facility is located in the Town of Brookhaven, while the majority within the Town of Riverhead.

The facility is bordered by Middle Country Road (route 25) to the north, agricultural land to the east, River Road to the south and Wading River Road to the west. Two paved runways are located at the facility. Runway 5-23 is located on the western half of the facility and oriented southwest to northwest. Runway 32-14 is located on the eastern half of the property, and is oriented southeast to northwest. The site plan is provided in Figure 2.

Operations History

NWIRP- Calverton was formerly a Government-Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman Corporation (aka Grumman Corporation) until February 1996. The facility was constructed by the US Navy in the early 1950s for the use in the development, assembly, testing, refitting and retrofitting of Naval combat aircraft. The facility supported aircraft design and production at the Grumman's Bethpage Facility, located in Nassau County, Long Island New York.

Most of the industrial activity was confined to the developed area in the center and south of the center of the site. Operations that generated hazardous waste include metal finishing processes such as metal cleaning and electroplating, other maintenance operations, temporary storage of hazardous waste, fueling operations and various training operations.

In September 1998, the majority of the land within the developed section of the facility was transferred to the Town of Riverhead for redevelopment. Because of the need for additional environmental investigation and the potential need for remediation, the Navy retained several parcels of land, approximately 358 acres, within the developed section. The parcels and associated Navy Installation Restoration sites are listed below and shown on figure 2.

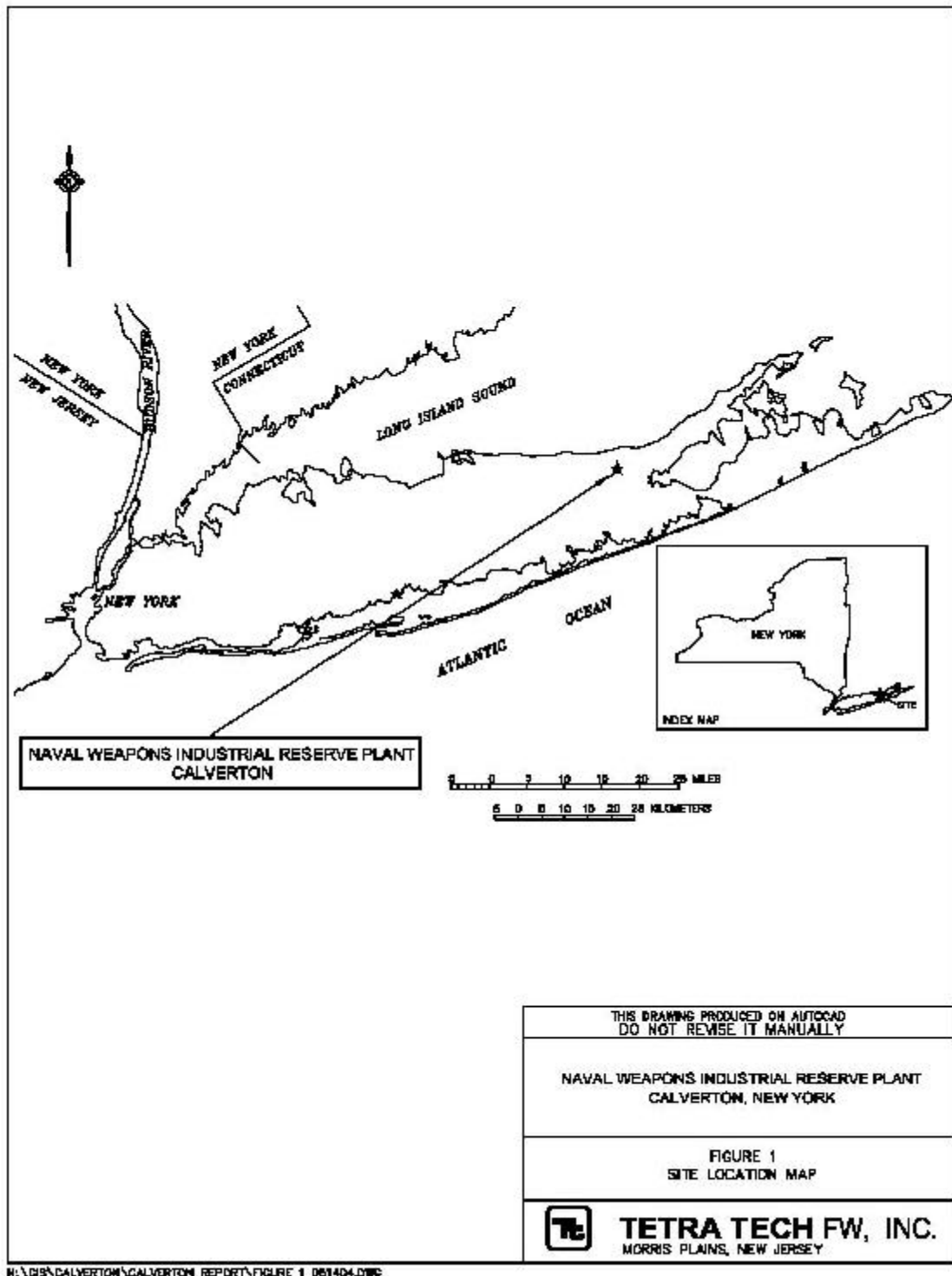


Figure 1 Site Location Map

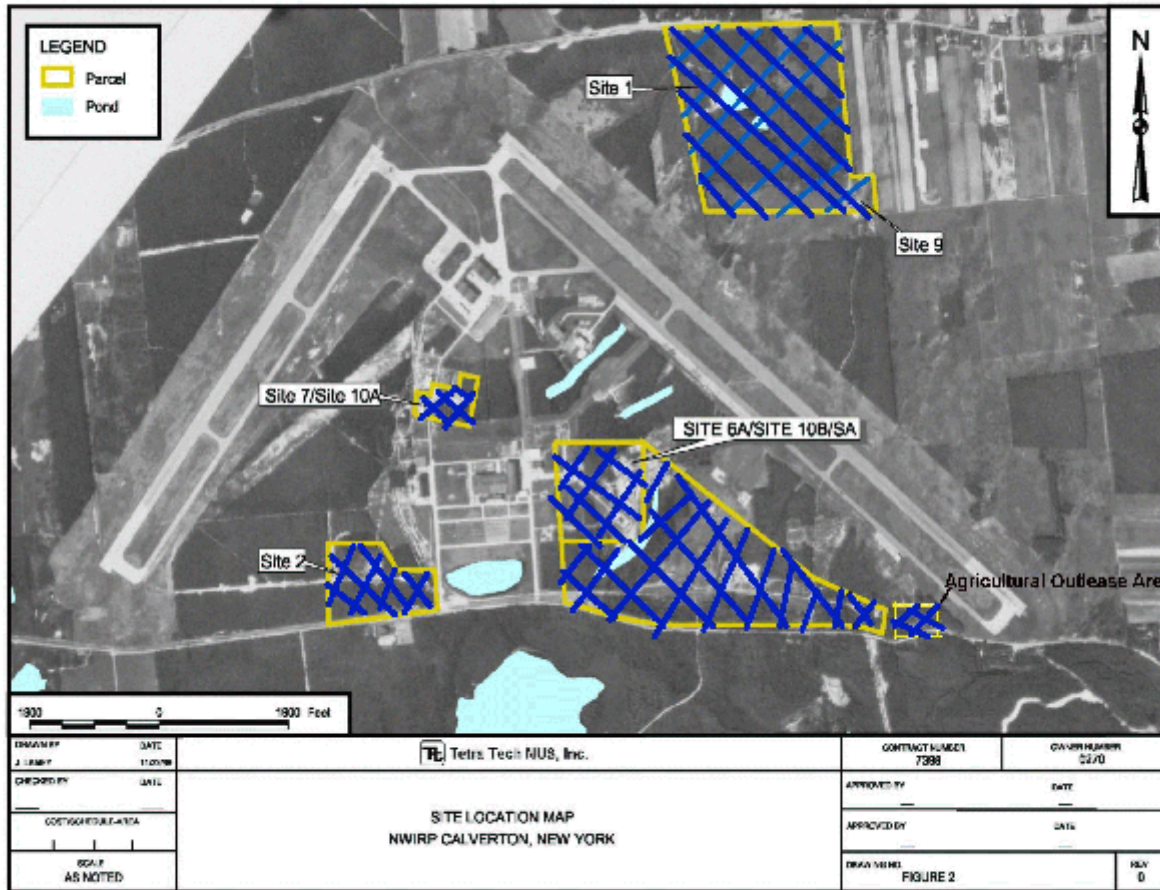


Figure 2 - Site Plan

The Navy Installation Restoration sites include:

- **Parcel A** (32 acres)
 - Site 2 - Fire Training Area
 - Site 6A - Fuel Calibration Area
 - Site 10B - Engine Test House
- **Parcel B1** (40 acres)
- **Parcel B2** (131 acres)
 - Southern Area
- **Parcel C** (10 acres)
 - Site 7 - Fuel Depot
 - Site 10A - Jet Fuel Systems Laboratory
- ▶ **Parcel D** (145 acres)
 - Site 1 - Northeast Pond Disposal Area
 - Site 9 Electronic Countermeasures (ECM) Area
- ▶ **Agricultural Outlease Area**

In 1999 approximately 3,000 acres of undeveloped land outside of the fenced area was transferred to the Veterans Administration and the New York State Department of Environmental Conservation (DEC).

All of the permitted units in the NWIRP 6NYCRR Part 373 Hazardous Waste Permit for storage have been clean closed. The permit was reissued in April 2000 to contain only Corrective Action requirements.

The regulatory status of the individual sites in each area are summarized in Table 1 on the following page and in the discussion of Contamination and Corrective Action.

**NWIRP Calverton
Environmental Indicator Form - CA725
Site Status Summary**

Area Name	Remedial Investigation	Interim Remedial Measure	Remedial Feasibility Study	Record of Decision Statement of Basis
Parcel A				
<u>Site 2 - Fire Training Area</u>	2/1/2001	12/1987 - 12/1993 Active/Passive Recovery 1995 - 2000 Air Sparging		
Parcel B-1				
<u>Site 6A - Fuel Calibration Area</u>	7/1/2001	1987 1993 Active Recovery 1993 1996, 2000 - present Passive Recovery 9/8/93 All Underground Tanks Removed 1984 Swale Clean-Up		
<u>Site 10B - Engine Test House</u>	7/1/2001	1993 all tanks removed		
Parcel B-2				
Southern Area	7/1/2001	No Remedial Measures Needed		
Parcel C				
<u>Site 7 - Fuel Depot</u>	1/1/2000	05/1988 - All Tanks Removed 1/28/03 - present AS/SVE	4/1/2002	1/28/03
<u>Site 10A - Jet Fuel Systems</u>	1/1/1998	12/1/1993 - 1996 Passive Recovery		
Parcel D				
<u>Site 1 - Northeast Pond Disposal</u>	2/1/2002	8/5/2003 All waste/contaminated sediments	2/1/2002	1/28/03
<u>Site 9 - Electronic Counter</u>	12/1/2002	No Action Needed		No Action Needed
Agricultural Outlease Area		1993 Contaminated Soil Removed		

Table 1- Site Status Summary

Soils and Geology

NWIRP Calverton lies within the Atlantic Coast Plain and is underlain by a thick sequence of unconsolidated deposits. The surface topography was created or modified by Pleistocene glaciation. Ground surface elevations on Long Island range from sea level to approximately 400 feet above mean sea level (msl.) The two most prominent topographical features in the Long Island area are the Ronkonkoma terminal moraine and the Harbor Hill end moraine. NWIRP Calverton occupies a relatively flat, area between these two features.

NWIRP Calverton is underlain by approximately 1,300 feet of unconsolidated sediments that make up four distinct geological units: the Upper Glacial Formation; the Magothy Formation; the Raritan Clay Member of the Raritan Formation; and the Lloyd Sand Member of the Raritan Formation. The 250 foot thick, Upper Glacial Formation directly underlies the facility and contains glacial till and outwash deposits.

Surface Water Hydrology

The majority of the site lies within the Peconic River drainage basin. The eastward-flowing Peconic River is located approximately 1,300 feet south of the facility at its closest point. The Peconic River discharges to the Peconic Bay located 8.5 stream miles from the facility.

Major surface water features on the site include McKay Lake and the Northeast Pond. McKay Lake is a man-made groundwater recharge basin located north of River Road, midway along the southern site border. Several small drainage basins (Runway Ponds) exist near the Fuel Calibration Area. The location of these on-site surface water bodies is shown on Figure 3. These surface water features are generally land locked except that McKay Lake has an intermittent discharge to Swan Pond, and overland flow can periodically occur between the drainage basins and the Peconic River.

Groundwater Hydrogeology

The unconsolidated sediments that underlie NWIRP Calverton are generally medium to coarse-grained sand that make up an important, high-yield aquifer beneath the site.

NWIRP Calverton straddles a regional groundwater divide. Groundwater beneath the northern half of the facility flows to the northeast, with the Long Island Sound as the probable discharge point for shallow groundwater. (See figure 3) Groundwater beneath the southern half of the facility flows to the southeast with the Peconic River basin as the likely discharge point.

Groundwater on the divide, flows to the east. The precise location of the divide fluctuates seasonally as the water table elevation changes.

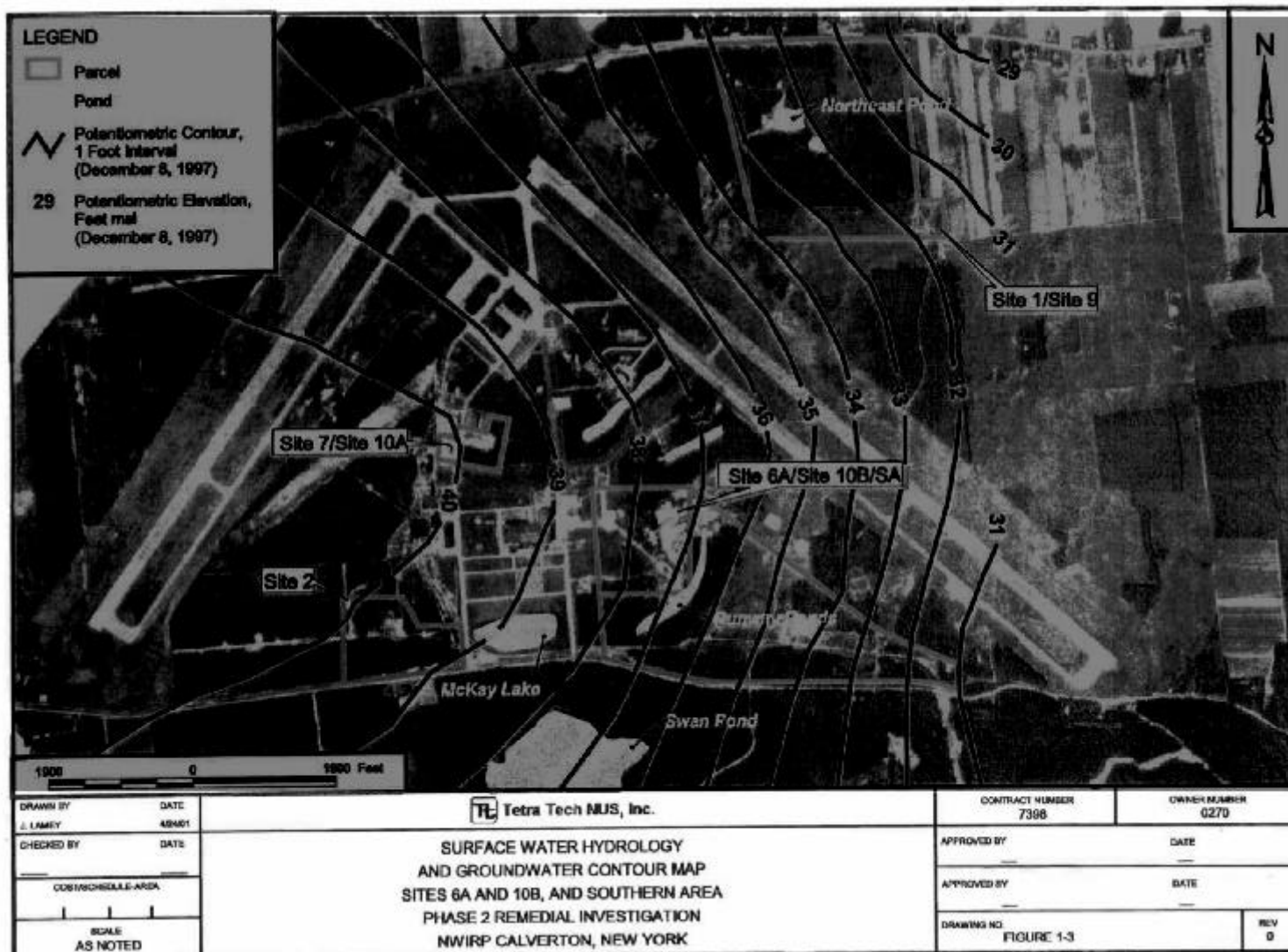


Figure 3 - Groundwater and Surface Water Hydrogeology

CONTAMINATION AND CORRECTIVE ACTION

Parcel A:

The only Area of Concern in Parcel A is Site 2 - the Fire Training Area. This area is discussed below:

Site 2 - Fire Training Area

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH

The Fire Training Area had been used to train Northrop Grumman crash rescue teams. This activity started in 1955 and possibly as early as 1952. Before 1982, Grumman would clear areas up to 100 feet or more in diameter and create an earthen berm that was filled with water. Waste fuels, oils, and solvents were floated on water and ignited. Aircraft sections were sometimes placed in the cleared area to simulate actual crash conditions. Rescue crews trained by extinguishing these fires.

In 1982 there was a waste fuel spill from a 6,000-gallon underground storage tank located north of the fire training pit. No spills were recorded prior to 1982. Contaminated soils from the spill were excavated and disposed off-site. That year, Grumman replaced the underground tank with a concrete-lined basin and a 1,000-gallon above-ground storage tank. Spills from the above storage tank in 1983 were contained within the concrete-lined basin.

Table 2
Contaminants of concern found at the fire training area
during the 1995 RCRA Facility Investigation

<u>Contaminant</u>	<u>Maximum Concentration Detected</u>	
	<u>Soil ug/kg</u>	<u>Groundwater ug/l</u>
2-butanone	5,900	
chloroethane	330	1,100
1,1-dichloroethane		1,200
dichlorobenzene	900	
tetrachloroethene	470	
1,1,1-trichloroethane	9,900	140
ethyl benzene	3,700	
toluene	6,100	320
xylenes	85,000	230
Total PCBs	3,640	18
Total PAHs	31,000	3
Lead	390,00	30.80

A groundwater recovery system was installed in December 1987. This system consisted both of an active and a passive recovery system. The active system included a groundwater pumping well, an oil recovery well, and an oil water separator tank. The passive recovery system consisted of hydrophobic filters located in shallow wells. As of December 1993, 270 gallons of petroleum product had been removed from the site. The active system was shut down in 1993 but free product recovery using bailers, continued until 1996.

A pilot-scale air sparging/soil vapor extraction (AS/SVE) was installed at the fire training area in 1995. As of 2000, approximately 80 pounds of target VOCs have been removed. In addition, an estimated 30,000 pounds of organics have been destroyed through biodegradation.

The extent of soil contamination was estimated to be 80,000 square feet with an average depth of 8.2 feet. The estimated volume of contaminated soil was 25,000 cubic yards. This volume has been reduced significantly by operation of the AS/SVE system. To complete the cleanup, the Navy plans to remove the concrete fire training ring and any contaminated soil that may exist above or below the ring.

Currently, the area is enclosed by a fence and no human exposure pathways are believed to exist from Parcel A.

References:

- ▶ HNUS, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNUS, 1995. RCRA Facility Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, January 1997. Final Basewide Phase I Environmental Baseline Survey for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, February 2001. Draft Phase 2 Remedial Investigation and for Site 2 - Fire Training Area, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Foster Wheeler Environmental Corporation, January 14, 2000. Field Report Vacuum Assisted Oil Skimming Pilot Test, Fire Training Area Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Department of Navy, January 2002. Technical Memorandum for Site 2 Fire Training Area and Site 6A- Fuel Calibration Area Test Pitting Activities.

Parcels B1 and B2:

Parcels B1 and B2 contain three areas of concern. Site 6A - The Fuel Calibration Area (contains both the old and new fuel calibration areas), Site 10B - The Engine Test House, and the Southern Area. These areas are discussed below.

Site 6A - Fuel Calibration Area

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH

Starting in 1956, the old fuel calibration area was used for testing aircraft engine and fuel systems. The area contained a 320 square foot, cinder block, fuel distribution building and associated fuel tanks. In this area, aircraft fuel delivery systems were pressurized with fuel to test for leaks or potential system malfunctions. In 1980, the entire complex was replaced with new fuel calibration area located nearby.

Table 3
Contaminants of concern found at the Fuel Calibration Area
During the 1995 RCRA Facility Investigation

<u>Contaminant</u>	<u>Maximum Concentration Detected</u>	
	<u>Soil ug/kg</u>	<u>Groundwater ug/l</u>
2-butanone	3	
chloroethane		430
1,1-dichloroethane		5,800
Freon 113	4	
1,1,1-trichloroethane	7,400	15,000
ethyl benzene	1,800	
toluene	4,300	330
xylenes	17,000	780
1,2-dichlorobenzene		9
2-methylnaphthalene		74
naphthalene		120
Total PAHs	31,000	3

Table 4
Contaminants of Concern found in all of Parcel B
During the 1997 Phase 2 Remedial Investigation
and the
2000 Supplemental Groundwater Investigation

<u>Contaminant</u>	<u>Fuel Calibration Area</u>	<u>Engine Test House</u>	<u>Southern Area</u>
	<u>Maximum Concentration Detected</u>		
	<u>Groundwater ug/l</u>	<u>Groundwater ug/l</u>	<u>Groundwater ug/l</u>
chloroethane	720	152	7
1,1-dichloroethane	3600		220
1,1-dichloroethene	37	188	21
1,1,1-trichloroethane	2200	166	19
TCE	6		
ethyl benzene	27	1084	
toluene	180	337	
xylenes	570	196	

Old Fuel Calibration Area

The fuel tanks at the old Fuel Calibration Area included:

- ▶ 4000-gallon JP-5 underground storage tank
- ▶ 1000-gallon 1010 oil underground storage tank
- ▶ 275-gallon miscellaneous content underground storage tank
- ▶ 3000-gallon 1010 oil above ground storage tank

These tanks were removed on September 3, 1993.

The primary environmental concern at the old and new fuel calibration areas was as many as 230 gallons of fuel that were recorded to have been spilled while these areas were in use. The majority of the spills are believed to be concentrated in the areas surrounding the main fuel calibration pad.

Eighteen monitoring wells were placed south and southeast of the old fuel calibration area between March 1984 and November 1987. Contamination in this area included a free product layer and contaminated groundwater containing fuel-type and chlorinated VOCs. The chlorinated VOCs are believed to be from unreported spills of solvents that were used to clean the aircraft engines and fuel systems after they were tested.

A groundwater recovery unit was installed in 1987. This unit included a pumping well, an oil recovery well and an oil/water separator tank. The tank discharged into the drainage ditch paralleling the southern edge of the calibration pad. This discharge is believed to have contained chlorinated VOCs that caused secondary groundwater contamination at the site. Active Groundwater and free product extraction continued until 1993. Passive product recovery continued until 1996.

A pilot study was conducted for a Vacuum Oil Skimming Unit in September 1999. The pilot operation did not succeed because the volume of product available for recovery is too small and inconsistent for this type of system.

Passive free product recovery was restarted in 2000 and continues today.

New Fuel Calibration Area

Fuel tanks at the new Fuel Calibration area include

- ▶ 10,000- gallon JP-5 tank
- ▶ 10,000-gallon 1010 oil tank
- ▶ 5,000-gallon waste 1010 oil tank
- ▶ 500-gallon waste oil tank.

All of these are above ground tanks with secondary containment and a complex network of piping. The tanks have all been emptied and cleaned, but they remain on-site. Free product removed from the containment area was pumped to an adjacent oil-water separator (OWS) and then to a 500-gallon waste oil tank that discharged to the Sewage Treatment Plant. Overflow events and incorrect operation of the OWS resulted in uncontrolled discharge to a swale to the east of the new calibration area. The swale was cleaned up in 1984 when soil and sediments were excavated and properly disposed. Discharges into this swale are believed to be a secondary source of groundwater contamination from the Fuel Calibration Area.

Site 10B - Engine Test House

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH

The Engine Test House is a two story metal frame and cinder block building constructed in 1954. The building consisted of two engine test bays, a control room and utility rooms. The Engine Test house contained a fuel filtering system and pumps. Four underground storage tanks were associated with the Engine Test house. These included a 1000-gallon No. 2 oil tank, a 15,000-gallon JP-4/5 tank, and two 275-gallon miscellaneous content tanks. All of these tanks were removed in 1993.

The 1995 RFA investigation found evidence of soil and groundwater contamination in this area. The groundwater contamination included free product petroleum and groundwater contamination including fuel-type and chlorinated VOCs. The majority of the chlorinated VOCs are believed to have originated at the Fuel Calibration Area and have been transported to this site by the remedial discharges into the drainage swale and culvert during the 1980s and 1990s.

Southern Area

IMPACTS TO:

- ▶ GROUNDWATER

The Southern Area is located to the southeast of the Engine Test House and extends off-site. There are no known or suspected contaminated sources within this area however, this area is hydraulically downgradient of the Engine Test House (Site 10B), the Fuel Calibration Area (Site 6A). Contaminated groundwater from these areas flows through the Southern Area towards the Peconic River and Flander's Bay.

While contamination is believed to migrate under this area, there are no known drinking water wells in the area overlying the contaminated groundwater. Further, contaminated groundwater is overlain by a layer of uncontaminated groundwater which serves as a barrier to vapor migration. Thus, there is no potential pathway for vapor intrusion into occupied structures.

References:

- ▶ HNUS, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNUS, 1995. RCRA Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, January 1997. Final Basewide Phase I Environmental Baseline Survey for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, July 2001. Phase 2 Remedial Investigation for Site 6A - Fuel Calibration Area, Site 10B - Engine Test House, Southern Area, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Foster Wheeler Environmental Corporation, January 14, 2000. Field Report Vacuum Assisted Oil Skimming Pilot Test, Fire Training Area Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Department of Navy, January 2002. Technical Memorandum for Site 2 Fire Training Area and Site 6A- Fuel Calibration Area Test Pitting Activities.

Parcel C:

Parcel C consists of Site 7 - the Fuel Depot, and Site 10A the Jet Fuel Systems Laboratory. These are discussed below:

Site 7 - Fuel Depot

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH

The Fuel Depot was constructed in 1953 to supply aircraft fuel, gasoline and diesel fuel for NWIRP operations. The depot is comprised of a 700 square foot operations building, six USTs, one AST, fuel truck parking area, and associated pumping and dispensing equipment. Activities at the Fuel Depot have resulted in groundwater contamination by fuels, which may be the result of tank and pipe leakage, overfill, and spills.

Table 5
Contaminants of concern found at the Fuel Depot Area
During the 1995 RCRA Facility Investigation

<u>Contaminant</u>	<u>Maximum Concentration Detected</u>	
	<u>Soil ug/kg</u>	<u>Groundwater ug/l</u>
Benzene		17
Freon		100
Ethyl benzene	590	480
Toluene	4	710
Xylenes	2600	2400
Naphthalene		150
2-Methylnaphthalene	2600	78
Lead		25

The Underground Storage Tank area contained the following:

- ▶ 20,000-gallon aviation fuel tank
- ▶ 10,000-gallon diesel tank
- ▶ 10,000-gallon gasoline tank
- ▶ 50,000-gallon JP-5 tank
- ▶ 50,000-gallon JP-4 tank
- ▶ 50,000- gallon Jet A tank
- ▶ an emergency overflow tank.

As of May 1998, all the underground storage tanks have been removed from the Fuel Depot. During the tank removal, excavated soils that exhibited evidence of petroleum contamination were disposed off-site. In addition, in 1989 Northrop Grumman installed thirty-four monitoring wells to identify the extent of free product and to accumulate free product for passive recovery.

In 1999 the Navy conducted a soil gas survey, as part of phase 2 RCRA Facility Investigation, to identify potential soil and groundwater volatile organic contamination. A pilot scale Air Sparging/ Soil Vapor Extraction system was successfully implemented in 2003 to remove the fuel-VOC contamination. The Navy is currently replacing the pilot system with a full scale system for the site.

On January 28, 2003, a Record of Decision (ROD) was issued and approved by the United States Navy, with concurrence by the DEC and New York State Department of Health (DOH).

References:

- ▶ HNUS, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNUS, 1995. RCRA Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, January 1997. Final Basewide Phase I Environmental Baseline Survey for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation/Focused Feasibility Study for Site 7 - Fuel Depot, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, February 2002 Pre-design Air sparging/ Soil Vapor Extraction at Site 7 - Fuel Depot. Naval Weapons Industrial Reserve Plant, Calverton, New York
- ▶ Record of Decision for Site 7 - Fuel Depot. Naval Weapons Industrial Reserve Plant, Calverton, New York January, 28, 2003.

Site 10A - Jet Fuel Systems Laboratory

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH

The Jet Fuel Systems Laboratory is situated to the west, across the access road and just south of the Fuel Depot. The Laboratory was used for the testing fuels and fuel systems. In addition to the Laboratory building, there was an area behind the northwestern corner of the building where several underground storage tanks were found and removed by the Navy. There is no information regarding what was stored in these tanks. Contamination at this site includes VOCs and petroleum products.

Table 6
Contaminants of Concern in the Jet Fuel Systems Laboratory
During the 1995 RCRA Facility Investigation

<u>Contaminant</u>	<u>Maximum Concentration Detected</u>
	<u>Groundwater ug/l</u>
Benzene	17
Freon 113	1100
1,2,4-trichlorobenzene	38
1,1,1-trichloroethane	140
Ethyl benzene	8
Toluene	710
Xylenes	99

The Jet Fuel Systems Laboratory was investigated as part of a two-stage RFA investigation of potential industrial wastewater overflow releases into the cesspool-leach fields associated with the laboratory. The Navy has complete remedial efforts in this area and is currently completing reports to support their Finding of Suitability to Transfer (FOST). The agencies will review these reports to ensure that remedial efforts are adequate to support this transfer.

In addition, groundwater from production wells, located adjacent to the jet fuel systems laboratory, were found to contain concentrations of VOCs (including freon) at concentrations greater than drinking water standards. This contamination was investigated in the RFA for the Fuel Depot and will be included in the coverage area of the Fuel Depot's Air Sparging System.

Starting in 1993 Northrop Grumman conducted floating free product (jet fuel) recovery from the groundwater at this site. This continued until early 1996. Currently, the area is retained as Navy property and enclosed by a fence and no human exposure pathways are believed to exist.

References:

- ▶ HNU, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNU, 1995. RCRA Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, January 1997. Final Basewide Phase I Environmental Baseline Survey for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.

Parcel D:

Parcel D consists of Site 1 - the Northeast Pond Disposal Area and Site 9 the Electronic Countermeasures (ECM) Area. These are discussed below:

Site 1 - Northeast Pond Disposal Area

IMPACTS TO:

- ▶ GROUNDWATER
- ▶ SURFACE SOIL
- ▶ SOIL AT DEPTH
- ▶ SEDIMENT

The Northeast Pond area was used primarily for disposal of construction and demolition materials including concrete, brick and wood. Some aircraft sections, tooling materials, office materials and paint cans are also believed to have been disposed there. It is possible that even more limited amounts of petroleum, oils and lubricants, halogenated and non-halogenated solvents and paint sludge may also have been disposed. A buried drum was encountered during the 1995 RCRA Facility Investigation (RFI) Program. Testing of the drum contents and adjacent soils detected a relatively high concentration of 1,1,1-trichloroethane (390,000 ug/kg at one location). Disposal at the Northeast Pond area ended in 1984.

In general, volatile organic compounds (VOCs) were detected sporadically and at relatively low concentration in the soil and fill material. Semivolatile organic compounds (SVOCs) including polynuclear aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs) were detected throughout the fill material. Compounds detected at levels of significance are listed in the table below.

Table 7
Contaminants of Concern found at the Northeast Pond Landfill
During the 1995 RCRA Facility Investigation

<u>Contaminant</u>	<u>Maximum Concentration Detected</u>			
	<u>Soil / Waste ug/kg</u>	<u>Groundwater ug/l</u>	<u>Surface Water ug/l</u>	<u>Sediments ug/kg</u>
VOCs				
1,1,1-trichloroethane	390,000	5.7		7
1,1-dichloroethane		5.9		18
toluene				610
Pesticides				
Aldrin		0.048		
4,4'-DDD			0.02	2,000
Total PCBs	8,400	5.2		980
SVOCs				
Naphthalene	1,700			
Total PAHs	182,500			
Total phtalates	1,000			
Metals				
Chromium	70,600,000		63.3	70,500
Hexavalent Chromium	191,000	76.0		
Copper	15,500,000		14.9	15,100
Iron		14,500	3,870.0	
Lead	3,940,000	45.3	8.1	136,000
Manganese		1,720		
Mercury		4.1		
Nickel	1,930,000			
Silver	320,000			
Thallium		6.7		
Zinc	989,000	1,260	221.0	58,900

On January 28, 2003, a Record of Decision (ROD) was issued and approved by the United States Navy, with concurrence by the DEC and DOH. The selected remedy in this ROD was to excavate all landfilled waste materials, contaminated soil and contaminated sediment with subsequent off-site disposal. This removal action is now completed. An estimated 50,000 cubic yards of soil and debris were removed from the former disposal area. In addition, an estimated 1,500 cubic yards of sediment were removed from the pond.

Short-term groundwater monitoring will be conducted for a period of 2 years on a semi-annual basis to determine what impacts, if any, the excavation of landfilled materials has had on groundwater quality. Long-term groundwater will not be necessary unless significant levels of contaminants are found in the groundwater. This is not expected to happen because the source of contamination has been removed.

References:

- ▶ HNUS, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNUS , 1995. RCRA Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, January 1997. Final Basewide Phase I Environmental Baseline Survey for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation and Focused Feasibility Study for Site 1 - Northeast Pond Disposal Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Foster Wheeler Environmental Corporation, March 27, 2002. Excavation and Off-site disposal of Landfill at Site 1 - Northeast Pond Disposal Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Record of Decision for Site 1 - Northeast Pond Disposal Area. Naval Weapons Industrial Reserve Plant, Calverton, New York January, 28, 2003.

Site 9 Electronic Countermeasures (ECM) Area

NO SITE RELATED IMPACTS

The Electronic Countermeasures (ECM) Area is located in the southeast corner of Parcel D. This area was constructed in the early 1970's and was used into the early 1990's for testing and evaluating electronic equipment. 1,1,1-Trichloroethane (TCA) was used as solvent/cleaning agent in the ECM laboratory. In 1996, the ECM building was demolished and equipment in the surrounding area was removed.

Just east of the ECM Area fence line, an experimental sod farming program was conducted in the late 1980's to early 1990's. As part of this experimental program, a series of monitoring wells were installed by Suffolk County Department of Health Services (SCDHS) and TCA was detected at a concentration of 190 ug/l in one well.

As part of the Phase 2, Extended Site Investigation, two onsite monitoring wells were installed in 1997 and 11 off-site monitoring wells were installed in 2000. The maximum concentration of TCA detected in these wells was 2 ug/l, which is less than the New York State drinking water standard. Natural attenuation processes are believed to have reduced any contamination that was present to concentrations that are no longer significant.

Based on these findings, no further investigation is warranted at this site.

References:

- ▶ HNUS, 1992. SITE INVESTIGATION REPORT, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ HNUS, 1995. RCRA Investigation, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ C.F. Braun, December 1997. Phase 2 RCRA Facility Investigation Filed Sampling for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- ▶ Tetra Tech Nus, February 2002, Phase 2 Extended Site Investigation for Site 9 - Electronic Countermeasures (ECM) Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.

Agricultural Outlease Area:

The Agricultural Outlease area, located the Southeast Buffer Zone II, consists of a complex of former agricultural buildings that were operated as a family farm under a lease agreement with a local farmer. The lease was in effect until December 1996.

Potentially hazardous materials stored in the buildings included pesticides, fertilizer, lead acid batteries and miscellaneous flammable or toxic liquids. Three underground storage tanks and one above ground storage tank were located on the site.

Although pesticides and metals were detected in individual soil samples at concentrations above DEC clean-up objectives or background (for metals), the risk assessment indicated no unacceptable risks to human health from exposure to surface soil under a recreational user exposure scenario. There is no adverse impact to groundwater from site activities.

Based upon the recommendations of an August, 1998 Site Investigation, all on-site structures, farm implements, etc. have been demolished, excavated and/or removed from the site for recycling and/or disposal, as appropriate. In addition a limited soil removal was conducted at three areas where elevated concentrations of pesticides were found.

References:

- ▶ Tetra Tech, NUS Corporation. SITE INVESTIGATION AT THE AGRICULTURAL OUTLEASE IN ZONE II Southeast Buffer zone for Naval Weapons Industrial Reserve Plant, Calverton, New York.

Air (Indoor / Outdoor):

In general, all of the known groundwater contamination at the site is moving away from the occupied building so indoor air impacts are expected to be limited. However, due to the presence of groundwater contaminated with volatile organic compounds and large expanses of pavement adjacent to the areas of concern, the United States Environmental Protection Agency (EPA), in conjunction with DEC, DOH and SCDHS, conducted an independent study of soil gas and indoor air. Our goal was to determine if residual contamination in the soil could potentially impact indoor air. The study does show that some low levels of contaminants are present in soil gas, indoor air and occasionally, in ambient air at the site. However, staff at all four agencies have reviewed the data and have concluded that the detected contaminants are either: at insignificant levels; are at levels considered to be representative of background concentrations for the area; or are believed to be present largely due to building operations. Accordingly, the Agencies have determined that, under current contaminant conditions and building use, soil gas is not currently having a significant impact on the indoor air quality of buildings and no complete exposure pathway exists at this time.

References:

- ▶ Techlaw EPA Contract No. 68-W-02-038; EPA Work Assignment No R02808; Environmental Indicator Evaluation; NWRP Calverton Field Sampling Activity Report; Task 03 May 4, 2004
- ▶ Suffolk County Department of Health, NWIRP Calverton, April 2, 2004 Sampling Results - William Bohler, May 7, 2004.
- ▶ Suffolk County Department of Health, NWIRP Calverton, June 17, 2004 Sampling Results - William Bohler, June 28, 2004.
- ▶ NYS Department of Health, Summary of Indoor and Outdoor Levels of Volatile Organic Compounds from Fuel Oil Heated Homes in NYS, 1997-2003.

Table 8

Compound	Site 6A (Former Fuel Calibration Area)					
	Maximum Concentration Detected (ug/m3)				NYSDOH Statewide Average Data base Upper/Lwer Quartile	
	Soil/Gas 4/01/04	Outdoor 4/01/04	Indoor 6/17/04	Indoor 7/23/04	Indoor	Outdoor
Acetone	42 / 100	ND	ND	ND	12-46	4.3-14
Benzene	1.8 / 5.8	ND	2.51	1.13	1.2-5.7	0.86-2.6
1,3-Butadiene	5.6 / 12	ND	14.61	ND	NA	NA
2-Butanone (MEK)	8.0 / 24	ND	2.34	1.69	1.2-5.4	0.29-2.3
Carbon Disulfide	3.1 / 9.9	ND	0.12	0.11	NA	NA
Cyclohexane	1.2 / 4.1	ND	0.95	0.47	0.21-2.9	0.1-0.62
1,4-Dioxane	4.3 / 16	ND	ND	ND	NA	NA
Ethanol	10 / 19	5.4 / 10	ND	ND	40-610	3.8-17
Ethyl Benzene	0.99 / 4.4	ND	1.76	2.17	0.43-2.8	0.14-0.61
Freon 11	1.1 / 6.2	ND	1.65	2.36	1.3-5.5	0.19-2.6
Freon 12	ND	ND	0.53	1.9	0.14-5.6	0.12-5.1
Hexane	1.3 / 4.7	ND	5.41	0.54	0.63-6.5	0.2-1.1
Methylene Chloride	ND	ND	ND	0.1	0.38-6.3	0.14-0.87
Tetrachloroethene	ND	ND	0.31	0.29	0.13-1.2	.087-0.34
Toluene	2.6 / 9.9	1.6 / 6.3	10.76	13.95	4.2-25	0.68-3.3
1,1,1-Trichloroethane	48 / 260	ND	0.23	0.13	0.18-1.4	0.13-0.38
1,2,4-Trimethylbenzene	1.7 / 8.3	1.0 / 5.0	2.31	4.08	0.78-4.4	0.15-1.0
m,p-Xylene	3.5 / 16	1.8 / 8.2	6.09	6.03	0.52-4.7	0.13-0.69
o-Xylene	1.2 / 5.3	ND	2.23	2.46	0.39-3.1	0.11-0.74

Notes:

MEK – Methyl Ethyl Ketone

ND – Not Detected

ug/m3 – Micrograms per cubic meter

Table 9

Area 7 (Former Fuel Depot) Former Facilities Maintenance Building (Building 282) & Former Transportation Storage Area (Building 285)					
Compound	Maximum Concentration Detected (ppbv / ug/m3)			NYSDOH Statewide Average Data base Upper/ Lwer Quartile	
	S/G 4/01/04	Ambient-2	Indoor 6/17/04	Indoor	Outdoor
Acetone	40 / 96	ND	ND	12-46	4.3-14
Benzene	2.3 / 7.6	ND	2.51	1.2-5.7	0.86-2.6
1,3-Butadiene	2.4 / 5.4	ND	14.61	NA	NA
2-Butanone (MEK)	3.5 / 10	ND	2.34	1.2-5.4	0.29-2.3
Carbon Disulfide	3.4 / 11	ND	0.12	NA	NA
Cyclohexane	ND	ND	0.95	0.21-2.9	0.1-0.62
1,4-Dioxane	ND	ND	ND	NA	NA
Ethanol	4.5 / 8.7	ND	ND	40-610	3.8-17
Ethyl Benzene	1.6 / 7.0	0.95 / 4.2	1.76	0.43-2.8	0.14-0.61
Freon 11	0.78 / 4.5	ND	1.65	1.3-5.5	0.19-2.6
Freon 12	1.4 / 6.9	ND	0.53	0.14-5.6	0.12-5.1
Hexane	0.86 / 3.0	ND	5.41	0.63-6.5	0.2-1.1
Methylene Chloride	ND	ND	ND	0.38-6.3	0.14-0.87
Tetrachloroethene	1.4 / 10	ND	0.31	0.13-1.2	.087-0.34
Toluene	5.0 / 19	1.9 / 7.2	10.76	4.2-25	0.68-3.3
1,1,1-Trichloroethane	3.2 / 18	ND	0.23	0.18-1.4	0.13-0.38
1,2,4-Trimethylbenzene	2.2 / 11	ND	2.31	0.78-4.4	0.15-1.0
m,p-Xylene	2.4 / 11	3.9 / 17	6.09	0.52-4.7	0.13-0.69
o-Xylene	1.2 / 5.5	1.0 / 4.4	2.23	0.39-3.1	0.11-0.74

Notes:

MEK – Methyl Ethyl Ketone

ND – Not Detected

ppbv – Parts per billion by volume

ug/m3 – Micrograms per cubic meter

- 3 Are there complete pathways between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Air (indoors)							
Soil (surface, e.g., <2 ft)	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Surface Water							
Sediment	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Soil (subsurface e.g., >2 ft)	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Air (outdoors)							

Instructions

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces (for Media which are not “contaminated”) as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media - Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations, some potential “Contaminated: Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations, they may be possible in some settings and should be added as necessary.

 X If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

___ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

___ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

4. Can the exposure from any of the complete pathways identified in #3 be reasonably expected to be “significant”² (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant”.

_____ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures from each of the remaining complete pathways to “contamination” (identified in #3) are not expected to be “significant”.

_____ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code.

5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”) - continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

Rationale and Reference(s):

Not applicable, see responses to questions 3 and 4.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA 725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

 X YE - Yes, “Current Human Exposures Under Control” has been verified. Based on a review of the information contained in this EI Determination, “Current Human Exposures” are expected to be “Under Control” at the NWIRP Calvrton, EPA ID# NYD003995198, located at Grumman Blvd. under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - “Current Human Exposures” are NOT “under Control”.

² If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

_____ IN - More information is needed to make a determination.

Approved by: _____

Date:

Henry Wilkie
Environmental Engineer I
New York State Department of Environmental Conservation

And

Date:

Larry A. Rosenmann
Engineering Geologist II
New York State Department of Environmental Conservation

Date:

Daniel J. Evans
Chief, Hazardous Waste Engineering Eastern Section
New York State Department of Environmental Conservation

Supervisor: Original signed by:
Edwin Dassatti, P.E.
Director, Bureau of Hazardous Waste and Radiation Management
New York State Department of Environmental Conservation

Date: 9/24/2004

Locations where References may be found:

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.