Department of Environmental Conservation

11.01.1.4

Division of Environmental Remediation

Record of Decision

Lockheed Martin Tactical Systems, Inc. Site
Operable Unit 1
Lake Success and Town of North Heampstead, Nassau County
Site Numer 1-30-045

March 1997

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* John P. Cahill, *Acting Co*mmissioner

DECLARATION STATEMENT - RECORD OF DECISION

Lockheed Martin Tactical Systems, Inc. Inactive Hazardous Waste Site
OPERABLE UNIT 1
Lake Success and Town of North Heampstead, Nassau County, NewYork
Site No. 130045

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for Operable Unit 1 (OU-1) for the Lockheed Martin Tactical Systems, Inc. inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Lockheed Martin Tactical Systems, Inc. Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for OU-1 for the Lockheed Martin Tactical systems, Inc. site and the criteria identified for evaluation of alternatives the NYSDEC has selected Soil Vapor Extraction/Catalytic Incineration Off-Gas Treatment/Source Area Excavation for soils, Air Stripping /Vapor Carbon Adsorption for groundwater, and Deed Restrictions/ Institutional Controls for sediments. The components of the remedy are as follows:

- Continue operation of ongoing Soil Vapor Extraction (SVE)/Catalytic Incineration System. The SVE system will be supplemented with soil and sludge removal.
- The ongoing groundwater treatment system will be expanded to treat 1,800 gallons per minute.

Groundwater treatment will be provided by air strippers with the addition of vapor phase carbon for emission control.

- A deed restriction will be imposed on the portion of the site where the recharge basins are located to limit access to the basins and restrict future use of the site. A security fence will be constructed around the entire recharge basins and will be inspected routinely.

- A remedial design program to verify the components of the conceptual design and provide the necessary details for the construction, operation and maintenance, and monitoring of the remedial program.

- Monitoring of the performance of the remediation system to ensure that remedial action objectives are met.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/31/97
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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RECORD OF DECISION

LOCKHEED MARTIN TACTICAL SYSTEMS, INC.
(FORMERLY UNISYS CORPORATION)
Operable Unit 1
Lake Success and Town of North Hempstead, Nassau County, New York
Site No. 130045
March 1997

SECTION 1: SITE LOCATION AND DESCRIPTION

The Lockheed Martin site is located between the Village of Lake Success and the Town of North Hempstead in Nassau County, New York. The mailing address of the facility is 365 Lakeville Road, Great Neck, N.Y. 11020. The site is bounded by Marcus Avenue to the north, Union Turnpike to the south, Lakeville Road to the west and Triad office park to the east. A site location map is presented in Figure No.1.

The site is approximately 94 acres in size. The site has a main manufacturing building, and six smaller buildings located immediately south of the main building, which totals approximately 1.5 million square feet. Three recharge basins are located in the southwest corner of the property adjacent to Lakeville Road. The majority of the remaining property is used for parking. The site is surrounded by a chainlink fence and access to the site is manned with 24-hour security.

The site is located in an area comprised of industrial, commercial, and residential properties. Industrial and commercial facilities surround the property on the east, northeast and northwest. Residential properties border the site to the southeast, south and southwest. Several golf courses are located north and northwest of the site. Lake Success is located within 1,600 feet to the north. There are six schools and one hospital which are located within a 3 kilometer (approximately 2 miles) radius of the site.

There are at least 14 public supply wells within a one and half mile radius of the site. See Figure No.2. One public supply well is located near the corner of Lakeville Road and Union Turnpike and other two public supply wells are located at Tanners Road. These three public supply wells are owned and operated by Manhasset - Lakeville Water District and are located within a half mile radius of the site. These three supply wells treat the water before distribution. The water from all the supply wells are routinely monitored by the water suppliers and the Nassau County Department of Health (NCDOH) to ensure that it meets NYSDOH public drinking water supply standards.

The Lockheed Martin site has been placed on the NYSDEC Registry a Class 2 inactive hazardous waste site. The site number is 130045. There are no other listed hazardous waste sites in the immediate vicinity of the site.

Operable Unit No. 1 (OU-1) consists of the on-site project area owned by Lockheed Martin, which is 94

acres. See Figure No.3.

An Operable Unit represents a portion of the site remedy which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable Unit 2 (OU-2) includes the off-site areas immediately surrounding the site. Some of the off-site work which has already been completed includes installation of 12 off-site monitoring wells, sampling of off-site wells, completion of a well survey and data review for domestic, industrial and municipal wells located within 1.5 mile radius of the site, collection and analysis of samples from Lake Success, and investigation and repair of Public Supply Well N-1802. The remaining off-site work will begin as soon as the NYSDEC approves the Remedial Investigation/Feasibility Study (RI/FS) Work Plan for OU-2. A RI/FS Work Plan for OU-2 is being prepared. The public will have an opportunity to comment on this OU-2 Work Plan in the near future, prior to its final approval by the NYSDEC.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The site was an active manufacturing facility from its startup in 1941 until approximately 1995, when all manufacturing activities ceased. However, some assembly, integration, prototype development and testing are still being conducted at the facility. Presently only engineering and administrative activities are conducted at the facility. The facility was originally designed and built by the U.S. Government and was operated under a contract with Sperry Gyroscope Company from 1941 through 1951. In 1951, the property was sold to Sperry, which merged with Burroughs in 1986 to form the Unisys Corporation. In 1995, Loral Corporation (Loral) acquired assets of Unisys Defense Systems, a division of Unisys Corporation. In early 1996, the electronics and systems integration business of Loral were purchased by Lockheed Martin, which currently owns and occupies the property.

Originally, the property included an additional 55 acres with a large manufacturing building immediately to the east of the present property. However, this building was demolished, the property was sold to a developer in the 1970s, and the present day Triad Business Park was constructed. The electrical substations located to the south of the property were formerly owned by Unisys, however, the equipment was always owned and operated by LILCO. LILCO leased the land from Unisys until 1992 when LILCO purchased the property from Unisys.

In the past, the facility has been used to manufacture a wide range of defense related products. Past manufacturing processes included a casting, foundry, etching, degreasing, plating, painting, machining and assembly. Chemicals used during manufacturing at the plant included halogenated and non-halogenated hydrocarbon solvents, cutting oil, paints and fuel oils as well as inorganic plating compounds.

The facility has been served by a sanitary sewer system since it was constructed in 1941. The on site storm water collection system is connected to the three recharge basins. The basins receive runoff from the parking lot, roofs and surrounding roads; no wastes were reported to be routed to the basins. Potable water used for cooling, and for a short period of time treated groundwater was routed to the basins.

Groundwater had been used for non-contact cooling purposes since the facility was constructed. The non-

contact cooling water system consists of three extraction wells and four diffusion wells which are located to the north and south of the main manufacturing building respectively. The groundwater is no longer used for cooling purposes.

There are five drywells located in the southeastern corner of the site. See Figure No.4. The drywells were reported to have received water containing solvents and oils from approximately 1941 to 1978. The drywells were decommissioned in 1978.

The site was designated as a Class 2 site by the NYSDEC on May 1, 1991.

2.2: Remedial History

The following is a chronological listing of investigations and remedial measures performed at the site. A more detailed description of these actions is provided in the January 1992 Site Assessment Report, January 1993 Final Groundwater Remediation Work Plan, November 1993 Soil Remediation Work plan and the September 1993 Remedial Investigation/ Feasibility Study (RI/FS) Work Plan.

- January 1978 - Waste disposal practices regarding the use of the drywells were initially investigated by the Nassau County Department of Health (NCDOH).
- May 1978 - Results of the sample taken from the drywell near the southeast corner of the plant on 1/13/78 by NCDOH indicated contamination by trichloroethylene, tetrachloroethylene, and 1,1,1 -trichloroethane.
- June through December 1978 - The lines leading to the drywells (referred to as "cesspools") were plugged and the residual effluent in the dry wells was pumped out.
- March 1979 - The emergency drain from the storage area was plugged.
- 1981 - An above ground tank used for storage of ethylene was removed.
- Early 1980s - Seven underground solvent storage tanks were removed. These tanks were located outside the reclamation room. Three underground #2 fuel oil storage tanks located immediately south of the former Foundry Building were also removed.
- 1988 through 1992 - Following is a summary of groundwater and soil investigations performed between 1988 and 1992. Most of this information is contained in the 1992 Site Assessment Report. Initially NCDOH and/ or Nassau County Department of Public Works (NCDPW) provided field oversight during these investigations.

1. Twenty-nine (29) monitoring wells were installed and groundwater samples were collected on five occasions.
2. Thirty-two (32) borings were drilled and approximately sixty-five(65) soil samples were collected and analyzed for various parameters.
3. Two (2) recovery wells were installed.
4. A pump test was conducted on production well EW-2
5. Two (2) groundwater models were constructed.
6. Downhole geophysical logging was performed on the monitoring wells.
7. A vapor extraction pilot test was performed in the reclamation room area (Drywell area).

8. A soil gas survey was performed in the reclamation room area.
9. 1990 - An underground gasoline storage tank and approximately 20 cubic yards of soils were excavated and removed from the site.
10. 1991 - Eight #6 fuel oil underground storage tanks and approximately 175 cubic yards of soils were excavated and removed from the site.

- December 1991 - Unisys Corporation entered into an Administrative Order on Consent with the NYSDEC.
- April 1993 - Operation of the Granular-activated Carbon (GAC) system for the remediation of groundwater began.
- April through June 1993 - Investigation of public supply well N -1802 (Lloyd well) was completed.
- January 1994 - Operation of the Soil Vapor Extraction (SVE)/Catalytic Incineration system for the remediation of soils in the vicinity of drywell area began.
- February 1995 - Operation of the air stripping polishing system in addition to the GAC system for the remediation of groundwater began.

Currently, the ground water remediation systems and soil remediation systems are operating. Sampling is being conducted in compliance with the approved Interim Remedial Measures (IRM) Work Plan. (See Section 3.2)

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the site presents a significant threat to human health and the environment, the responsible party (Lockheed Martin Tactical Systems, Inc.) has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

3.1: Summary of the Remedial Investigation (RI)

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The Phase I RI was conducted between October 1993 and March 1995 and the supplemental RI was concluded in November 1996. Two reports, entitled Phase I Remedial Investigation Report and Supplemental Remedial Investigation Report dated December 1996 have been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- *Background information review.*
- *Soil-gas Surveys were conducted at one Off-site and five On-site locations.*

- *The drilling of soil borings and collection of of soil samples.*
- *A total of 59 monitoring wells have been installed. There are 47 on-site and 12 off-site wells, which include 29 monitoring wells installed during the site assessment conducted during 1988 and 19992. The wells range in depth from 90 feet to 400 feet.*
- *The sampling of on and offsite monitoring wells.*
- *The collection and analysis of two rounds of surface water and sediment samples from the three on-site recharge basins.*
- *The development of a groundwater flow model.*
- *The completion of a pumping test, an electromagnetic survey, an air quality investigation, an off-site water quality and well survey.*
- *The collection of surface water and sediment samplesfrom Lake Success.*
- *The completion of fish and wildlife impact analysis.*

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Lockheed Martin site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil and the Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediments was used for sediments.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). Air sampling results are reported in parts per billion by volume (ppbv). For comparison purposes, SCGs are given for each medium.

3.1.1 Nature of Contamination:

As described in the RI Report, many soil, groundwater, air, surface water and sediment samples were collected at the site to characterize the nature and extent of contamination.

SOIL

As part of the RI, potential source areas of previously identified soil and groundwater contamination were further investigated.

Soil investigation included collection of soil samples and performance of a soil gas survey.
Several soil samples were collected from different areas on-site. During the first round of the RI, soils

samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and metals.

The concentrations of VOCs and metals detected in soil samples from the dry well area were above the NYSDEC recommended site specific clean up objectives. Remediation of soils in the drywell area is already underway as part of the IRM. In the drywell area, trichloroethylene, tetrachloroethylene and 1,2 dichloroethylene were the primary VOCs of concern detected in the soils. Lead, beryllium barium, mercury, copper, chromium, aluminum, arsenic, cadmium, selenium, and zinc exceeded background concentrations and/or recommended cleanup objectives in one or more soil samples. Low levels of SVOCs, PCBs and pesticides were also detected in one or more soil samples.
Low levels of SVOCs, PCBs, and VOCs were detected in soil samples collected from the LILCO substation.

SEDIMENTS

Two rounds of sediment samples were collected from the three on-site recharge basins. Sediment samples were analyzed for VOCs, SVOCs, pesticides, PCBs and metals during the first round. Additionally, selected sediment samples were analyzed for leachable metals using the Toxicity Characteristic Leaching Procedure (TCLP) method. Results showed the presence of low levels of VOCs, SVOCS, pesticides and PCBs in the sediment samples. Arsenic, chromium, magnesium, selenium, mercury, silver, nickel, lead and zinc were present in most of the sediment samples above NYSDEC recommended soil cleanup objectives. None of the metals in the sediments samples showed hazardous characteristics.

GROUNDWATER

A total of 59 monitoring wells have been installed on site and off site. As part of the monitoring program instituted for the IRM at the site, these wells were sampled to evaluate groundwater quality on and off site.

During the Site Assessment, concentrations of contaminants of concern were found in groundwater samples collected from on and off site wells. The contaminants found in groundwater were similar to those found in the soil samples collected from the vicinity of the drywell area.

The majority of monitoring wells have been sampled at a minimum of four times. During the RI, the first round of all samples were analyzed for VOCs, SVOCs, Metals, pesticides and PCBs.

Based upon the analytical results, the primary contaminants of concern including PCE, TCE and 1,2 DCE were found in groundwater samples at concentrations exceeding NYSDEC groundwater standards. Remediation of groundwater is already underway as part of the IRM.

In addition to the primary contaminants of concern, other VOCs detected include 1,1,1 -trichloroethane (TCA) and Freon 113. PCBs were not detected in any of the groundwater samples.

Four SVOCs were detected in nine wells at relatively low concentrations with the exception of phenol. One pesticide, heptachlor, was detected in an upgradient well. The analytical data indicates that metals concentrations in all wells, with the exception of an upgradient well, were below NYSDEC groundwater standards.

The highest concentrations of VOCs in groundwater beneath the site is present within the Glacial and the

upper and intermediate Magothy aquifers.

Concentrations of VOCs in the deeper portions of the Magothy aquifer are significantly lower.

SURFACE WATER

Two rounds of surface water samples were collected from the three on-site three recharge basins. Surface water samples were analyzed for VOCs, SVOCs, pesticides, PCBs and metals during the first round of sampling. Only 1,2 DCE was detected at a very low level in the first round of surface water sampling. No VOCs were detected in surface water samples during the second round of sampling. Zinc was detected at concentrations below NYSDEC standard.

AIR

An emission isolation flux chamber test was used at the site to directly measure emissions rates of VOCs permeating from soils in the vicinity of the drywell area located outside at the southeast corner of the main building. Results of the test indicate that VOCs are not being emitted from the subsurface of the site in the drywell area.
The majority of the site is paved or covered by buildings.

3.1.2 Extent of Contamination

Tables 1, 2, 3, 4 and 5 summarize the extent of contamination for the contaminants of concern and compares the data with the proposed remedial action levels - Standards, Criteria, and Guidance (SCGs) for the Site. The following are the media in each of the areas which were investigated and a summary of the findings of the investigation.

SOIL

Drywell Area

A total of 42 soil samples were collected from the drywell area during the RI. See Figure No.4. The levels of VOCs detected in the soil samples were significantly above the recommended soil cleanup objectives. These VOCs included tetrachloroethylene (0.002 to 18,000 ppm), trichloroethylene (ND to 7,800 ppm), 1,2 -dichloroethylene (ND to 160 ppm), xylene (ND to 3200 ppm), ethyl benzene (ND to 440 ppm), 1,1,1 - trichloroethane (ND to 65 ppm).

Several metals including, cadmium (ND to 23.9 ppm), chromium (ND to 670 ppm), cobalt (1.8 to 98.8 ppm), lead (2.2 ppm to 9,780 ppm), mercury (ND to 23.1 ppm), Nickel (12.6 to 679 ppm), selenium (ND to 9.4 ppm), zinc (ND to 4,350 ppm) and magnesium (400 to 15,300 ppm) were detected at levels higher than NYSDEC recommended soil cleanup objectives. The highest levels of VOCs and metals detected were associated with most of the sludge material encountered from the dry wells.

Several SVOCs including 1,2 - dichlorobenzene (ND to 89 ppm), 4- methylphenol (ND to 87 ppm), phenol (ND to 27 ppm), 1,3 dichlorobenzene (ND to 7.3 ppm) were detected above the NYSDEC recommended soil cleanup objectives. Low levels of some pesticides and PCBs were detected below soil cleanup objectives.

LILCO Substation Area

A total of four samples were collected from the LILCO substation. See Figure No.9. The only VOCs detected were 2- butatone and acetone at concentrations below the recommended soil cleanup objectives. SVOCs including chrysene (0.88 to 2.0 ppm) and benzo(a) pyrene (0.5 to 2.2 ppm) were detected slightly above the recommended soil cleanup objectives. PCBs were detected in only one sample which contained 0.39 ppm of Aroclor-1260, below recommended soil cleanup objectives.

Monitoring Well Split Spoon Samples

Five split spoon soil samples were analyzed for VOCs. No VOCs were detected in any of the split spoon samples.

Soil Gas Grids (SGS 3 and 4) Area

VOCs, with the exception of acetone, were not detected in soil samples collected at SGS 3 and SGS 4. See Figure No.9. The concentrations and types of SVOCs detected in the soil samples were similar to the concentrations and contaminants detected in a background soil sample. Trace levels of pesticides were detected. Low levels of PCBs were detected. Concentrations of metals at SGS 3 and 4, with the exception of arsenic, were comparable to background levels. Arsenic was found above the NYSDEC recommended soil cleanup objective.

Reclamation Room

One soil sample was collected below the reclamation room slab. See Figure No.9. VOCs were found, but below the NYSDEC recommended soil cleanup objectives.

SEDIMENTS

Recharge Basins

A total of 19 sediment samples were collected during two rounds of sampling from the recharge basins. See Figure No.9.

Metals including arsenic (0.76 to 18.6 ppm), chromium (14.1 to 171 ppm), lead (12.8 to 1470 ppm), mercury (ND to 3.4 ppm), nickel (ND to 119 ppm), selenium (ND to 6 ppm), silver (2.4 to 626 ppm), magnesium (804 to 6510 ppm) and zinc (107 to 1,770 ppm) were detected above NYSDEC recommended soil cleanup objectives. SVOCs including chrysene (0.85 to 31 ppm), benzo(a)anthracene (NDto31ppm), benzo(b)fluoranthene (0.074 to 23 ppm), benzo(k)fluoranthene (ND to 33 ppm) and indeno(1,2,3-cd)pyrene (ND to 16 ppm) were detected above site specific soil cleanup objectives. Low levels of VOCs, pesticides and PCBs were also detected, but below NYSDEC recommended soil cleanup objectives.

GROUNDWATER

The primary VOCs of concern including 1,2 - dichloroethene (total) (2 to 11,000 ppb) and trichloroethylene (ND to 320 ppb), tetrachloroethylene (ND to 350 ppb) were detected in most of the wells above NYS groundwater standards. See Figure No.5. Other VOCs detected above NYS groundwater standards include 1,1,1- trichloroethane (ND to 120 ppb) and trichlorotrifluoroethane (Freon 113) (ND to

77 ppb). Four SVOCs were randomly detected in nine wells at relatively low concentrations (0.6 to 1 ppb) with the exception of phenol (ND to 2,100 ppb). One pesticide, heptachlor, was detected (ND to 0.034 ppb) in an upgradient well. PCBs were not detected in any of the samples. Metals concentrations in all wells, with the exception of one upgradient well, were below NYS groundwater quality standards. One metal, cadmium, was detected above standards in an upgradient well.

SURFACE WATER

The only VOC detected was 1,2 dichloroethylene (ND to 2 ppb) during the first round of sampling. No VOCs were detected during the second round of sampling. Zinc (40 to 50 ppb) was the only metal detected during the second round of sampling which is below the New York State Groundwater Quality Standards.

3.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

1. Groundwater IRM

The groundwater IRM consists of a groundwater pump and treat system. Pump and treat systems are effective in remediating groundwater with VOCs. The groundwater is treated through the use of granulated activated carbon (GAC) filters and air strippers to remove the dissolved VOCs. Air stripping is a physical operation in which dissolved contaminants are transferred from water into a flowing air stream. The groundwater IRM has been in operation since April 1993 and to date has removed over 8,000 pounds of VOCs from the groundwater.

2. Soil IRM

The soil IRM consists of a soil vapor extraction (SVE) and catalytic incineration system which has been installed in the vicinity of the VOC impacted drywell area. Please see figure 6. The SVE systems are effective in remediating contaminated soils with VOCs. The SVE and treatment system has been in operation since January 1994 and has treated approximately 35,000 pounds of contaminants.

The SVE system uses a blower attached to several soil vapor extraction wells to draw air through soils. This flow of air allows VOCs to evaporate from the soils and into the air spaces between soil particles. Contaminants are then drawn toward the wells and into the treatment system where the vapors are treated prior to discharge to the atmosphere. SVE systems are effective in remediating contaminated soils with VOCs. The treatment system is Catalytic incineration (oxidation) which is a process in which the vapors are passed over a catalyst at an elevated temperature and the contaminants are converted to carbon dioxide, water, and inorganic acids.

Both the groundwater and soil IRMs have proven to be effective in reducing VOC concentrations in onsite soils and groundwater.

3. Public Supply Well IRM

The Public Supply Well - Lloyd Well No.N-1802 is located adjacent to the site on the corner of Lakeville Road and Union Turnpike and was installed in 1941. This well is owned and operated by Manhasset-

Lakeville Water District (MLWD). The well screen is reported to be set at a depth of 641 to 691 feet in the Lloyd formation. The Lloyd formation is separated from the overlying Magothy formation by approximately 150 feet of impermeable clay (Raritan Clay).

Routine testing of this well detected the presence of VOCs in the pretreated water and therefore a treatment system was installed to remove VOCs. NYSDEC requested that the well be investigated as part of the RI. Investigation of the well was conducted between April and June 1993. The contamination was attributed to a hole in the well casing. As an IRM, the well was repaired and put back in service in July 1996. After repairing the well, the concentrations of VOCs have decreased in the pretreated water. The water is routinely monitored by the water supplier and the NCDOH to ensure that it meets NYSDOH public drinking water supply standards.

3.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in the Baseline Human Health Risk Assessment Report for OU - 1.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

The risk assessment evaluated the potential current and future risks to residents, site workers, and remediation workers. Potential pathways for exposures include ingestion, dermal contact, and/or inhalation.

Identified Exposure Pathways and Receptors

Current Use:

The site at present is a secured facility, surrounded by fence. Entrances are manned by security guards 24-hours a day and site access is limited to site workers and authorized visitors only. The facility did utilize on-site groundwater as non contact cooling water. All potable water used by employees at the site is obtained from a public water source. Although contaminants have been detected in the soil, sediment, groundwater and surface water, under the current land use scenario, soil, sediment, groundwater and surface water pathways are limited to site workers and remediation workers. Review of public water supply well locations and populations indicate that everyone within a 1-1/2 mile radius of the site is on a public water supply system.

Future Use:

Although the use of the site in the future is likely to remain industrial or possibly become commercial, a future residential use is assumed for purposes of the risk assessment. If residences are constructed on the site in the future, child and adult residents are considered potential receptors. If the site remains industrial or becomes a commercial property, on-site construction workers and visitors are considered potential receptors. Potential future exposure points are soil, sediments, groundwater and surface water.

Potential exposure pathways which may exist at the site include:

Current land use:

Site Workers and Remediation/Construction Workers

- Incidental ingestion of soils and sediments.
- Dermal contact with soils and sediments.

Future land use:

Child and Adult Residents:

- Incidental ingestion of soils and sediments.
- Dermal contact with soils and sediments.
- Ingestion of groundwater.

Construction workers and remediation workers:

- Dermal contact with sediments and soils.
- Incidental ingestion of sediments and soils.

Because the Lockheed Martin site and surrounding locations are utilizing public water for drinking and other household uses, ingestion of contaminated groundwater is not expected because it is being treated by Water Districts. Therefore groundwater ingestion is not a complete exposure pathway.

The contaminated soils/sludges in the drywells is located at depths deeper than 6 feet below grade. Therefore the drywell soils are not accessible to future site residents or current and future site workers through normal daily activities. The contaminated soil/sludges from the drywells will be removed during implementation of the selected remedy for soils.

The sediments in the drainage basins are covered by several feet of standing water. A deed restriction will be imposed on the portions of the site where the recharge basins are located to restrict future use of the drainage basins. Institutional controls such as a security fence will be constructed around the entire recharge basin area to prevent unauthorized access to the three recharge basins and in the event the current fence surrounding the entire site is taken down in the future. The site will be posted indicating that trespassing, swimming and fishing are prohibited. Therefore, the basin sediments are not accessible to future site residents or current and future site workers through normal daily activities.

3.4 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

Based on preliminary analysis, activities at the site do not appear to be adversely impacting the limited fish and wildlife resources of the area. Nor is a potential for impact present in as much as groundwater is the only affected media at the site and the groundwater table is approximately 75 feet below grade. There are no endangered or threatened species within a two-mile radius. Flora and fauna typical of the area are in

evidence. The three recharge basins receive storm water runoff from the facility. Lake Success, the only regulated wetland identified, does not appear to be negatively influenced by site activities. Likewise, there is no evidence of site related impacts on Lake Success Parkway Woods, a significant habitat identified by the NYS Natural Heritage program.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The following is the chronological enforcement history of this site.

Orders on Consent

Date	Index	Subject
12/13/91	W-1-0527-91-02	RI/FS/IRM

The NYSDEC and the Unisys Defense Systems, Inc. entered into a Consent Order on December 13, 1991. The Order obligates the responsible party to implement a remedial program, consisting of a Remedial Investigation (RI), Feasibility Study (FS) and Interim Remedial Measure (IRM). On July 11, 1995, Loral Corporation agreed to implement the obligations under the Order. Effective July 23, 1996, Lockheed Martin Tactical Systems, Inc. undertook the obligations of the aforementioned Order.

Upon issuance of the Record of Decision the NYSDEC will negotiate an Order on Consent with Lockheed Martin Tactical Systems Inc. to implement the selected remedy.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- *Reduce, control, or eliminate to the extent practicable the contamination present within the soils on site.*
- *Provide for attainment of SCGs for groundwater quality to the extent practicable.*
- *Mitigate the impacts of contaminated groundwater to the environment.*
- *Prevent, to the extent possible, migration of contaminants from the*

sediments to the surface water and groundwater.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable.

At the Lockheed Martin site, two interim remedial measures are currently in operation. One is a SVE/Catalytic Incineration System which was installed in the vicinity of the VOC impacted drywell area. It addresses the source of the site groundwater contamination. The second IRM consists of a groundwater pump and treat system. The groundwater is treated through the use of granulated activated carbon (GAC) filters and air strippers to remove dissolved VOCs.

The remedial measures which are currently in operation have been demonstrated to effectively remediate contaminants associated with the site. Potential remedial alternatives for the Lockheed Martin site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled Feasibility Study Report - Operable Unit One dated January 1996.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1 Description of Alternatives

The potential remedies are intended to address the contaminated soils, groundwater and sediments at the site. The alternatives described below are numbered as they appear in the Feasibility Study Report.

GROUNDWATER REMEDIAL ALTERNATIVES:

All of the remedial alternatives developed for groundwater include the extraction, treatment, and reinjection of groundwater from the Glacial aquifer and upper and intermediate Magothy aquifer. Based on the groundwater model, it is estimated that a total of five extraction wells would be operated across the site extracting a total of 1,800 gallons per minute (gpm). Treated groundwater would be recharged through five injection wells onsite. See Table 6. The mass of VOCs dissolved in groundwater under the site was estimated to be approximately 15,400 pounds. The following remedial alternatives were evaluated for groundwater.

Alternative 1: Pump and Treat using Carbon Adsorption.

Groundwater treatment would be provided by a series of granular activated carbon adsorption units. This technology has proven to be effective in the removal of VOCs from groundwater and is capable of meeting groundwater discharge criteria. A disadvantage of this alternative includes off-site regeneration of carbon at a relatively high cost for carbon regeneration. The estimated cost for this alternative would be approximately $30.6 million over 30 years. Remedial effectiveness would be evaluated through a long term

groundwater monitoring program.

Present Worth	$30,570,000
Capital cost:	$ 2,289,640
Annual O&M:	$ 1,079,300

Alternative 2: Air Stripping

Groundwater treatment would be provided by air strippers. This technology has proven to be effective in the removal of VOCs from groundwater and is capable of meeting groundwater discharge criteria. This alternative would comply with applicable ARARs and SCGs for groundwater, but may not comply with ARARs and SCGs for the air emissions. A disadvantage of this alternative is the relatively high energy consumption, potential fouling of the air stripper and air emissions that may require control. The estimated cost for this alternative would be approximately $15.8 million over 30 years.

Present Worth:	$15,800,000
Capital Cost:	$ 2,297,640
Annual O&M:	$ 515,300

Alternative 2A: Air Stripping/Vapor Carbon Adsorption

Alternative 2A is the same as Alternative 2 with the addition of vapor phase carbon for emissions control. It consists of groundwater collection with air stripping for removal of VOCs. Air emissions from the air stripper(s) would be treated by vapor carbon adsorption prior to discharge to the atmosphere. See Figure No. 7. Carbon adsorption has proven to be very effective in the removal of VOCs in off-gas emissions. The estimated cost for this alternative would be approximately $18.6 million over 30 years.

Present Worth:	$18,641,000
Capital Cost:	$ 2,518,440
Annual O&M:	$ 615,300

Alternative 2B: Air Stripping/Catalytic Incineration

Alternative 2B is also the same as Alternative 2 with the addition of catalytic incineration for off-gas treatment. It consists of groundwater collection with air stripping for the VOCs removal. Air emissions from the air stripper (s) would be treated by catalytic incineration. Catalytic incineration has proven to be very effective in the removal of VOCs in off-gas emissions. The estimated cost for this alternative would be approximately $19.8 million over 30 years.

Present Worth:	$19,845,000
Capital Cost:	$ 3,094,440
Annual O&M:	$ 639,300

Alternative 3: UV Oxidation

Alternative 3 consists of groundwater collection using UV oxidation for the removal of VOCs. UV oxidation has proven to be very effective in the removal of VOCs in groundwater. Advantages include complete destruction of VOCs with no air emissions. Common limiting steps included the presence of

other dissolved materials which are preferentially oxidized. The estimated cost for this alternative would be approximately $ 28.7 million over 30 years.

Present Cost:	$28,787,000
Capital Cost:	$ 2,969,640
Annual O&M:	$ 985,300

SOIL REMEDIAL ALTERNATIVES:

As previously discussed, a SVE system with catalytic incineration of the off-gas has been in operation since 1994 treating the contaminated soils in the drywell area through the IRM program.

Alternative 1A: Soil Vapor Extraction/Catalytic Incineration Off-Gas Treatment/Source Area Excavation

The SVE/catalytic incineration portion of this alternative has already been implemented as an IRM. See Figure No.8. Catalytic incineration technology, which is presently being used, has proven to be very effective in the removal of VOCs from air. Under this remedial alternative, the SVE treatment system would be supplemented with soil and sludge removal by excavation. Based on the removal rate of the SVE experienced over the past two years, the duration of operation for this system would be an additional 2 to 5 Years.

Present Worth:	$1,717,000
Capital Cost:	$1,036,120
Annual O&M:	$ 138,808

Alternative 1B: Soil Vapor Extraction/Carbon Adsorption Off-Gas Treatment/Source Area Excavation

Alternative 1B is similar to alternative 1A except that off-gas emissions would be treated using regenerative vapor phase carbon. The soil and sludge removal program described for Alternative 1A above would be identical under this remedial alternative.

Present Worth:	$2,000,000
Capital Cost:	$1,252,000
Annual O&M:	$ 152,408

RECHARGE BASIN REMEDIAL ALTERNATIVES:

Sediment Alternative 2: Dredging of Sediments

This alternative encompasses the removal of the recharge basin sediments by means of a hydraulic dredge. For the purpose of evaluation of this alternative, it is assumed that three feet of sediments would be removed. The sediments would be dewatered on site and transported to a permitted treatment/disposal facility. Water produced during the dredging operation would either be recharged on-site, discharged to the local sewers, or transported to a permitted treatment/disposal facility.

Present Worth:	$9,620,120

Capital Cost:	$9,620,120
Annual O&M	$0

Sediment Alternative 3: Basin Draining and Sediments Excavation

This alternative consists of draining each of the three recharge basins with the water pumped to the local sanitary or storm sewer system. Removal of approximately three feet of sediments from all three basins would take place. The excavated sediments would be transported to a permitted treatment/disposal facility.

Present Worth:	$8,549,750
Capital Cost:	$8,549,750
Annual O&M:	$0

Sediment Alternative 4 : Deed Restrictions

Alternative 4 consists of land use and institutional control. Under this alternative, the water and sediments would remain in the recharge basins. However, land use control, such as deed restrictions would be instituted to limit the use and future development of the property.

Additionally, institutional controls such as fencing and no trespassing signs would be placed in the recharge basin area. The fence line would be inspected routinely and repaired as needed to ensure the integrity of the fence. Groundwater monitoring would be performed for two years to monitor the effectiveness of this remedy.

Present Worth:	$1,345,000
Capital Cost:	$1,258,500
Annual O&M:	$ 3,300

6.2: Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Groundwater Alternatives 1, 2A, 2B and 3 would comply with applicable ARARs and SCGs including ground water cleanup and discharge criteria. Alternative 2 would comply with applicable ARARs and SCGs for groundwater, but may not comply with ARARs and SCGs for the air emissions. Alternative 3 would oxidize other dissolved materials in the groundwater.

Soil Alternatives 1A and 1B would comply with applicable ARARs and SCGs including site -specific soil clean-up objectives.

Sediments Alternative 2 and 3 would comply with applicable ARARs. Alternative 4 would comply with ARARs and SCGs for groundwater only.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

All groundwater remedial alternatives except Alternative 2 are protective of human health and environment. Both soil remedial alternatives are protective of human health and environment.
All sediment alternatives will be protective of human health and environment. The two public supply wells located at Tanners Road are equipped with air strippers to treat the water to meet the State drinking water standards.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Worker exposure to groundwater contaminated with VOCs and contaminated soils during implementation of all alternatives would be controlled through a site specific health and safety plan developed prior to implementation. It is anticipated that the SVE/catalytic incinerator system which is currently operating would remediate the soils in 2 to 5 years. The pump and treat system would take longer to remediate the site in approximately 30 years.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

The extracted groundwater would be treated to NYSDEC discharge standards. Sampling would be performed to monitor groundwater treatment system performance over the life of the groundwater remediation program. These groundwater remedial alternatives provide for long term effectiveness and permanence. The Lockheed Martin site and surrounding locations are utilizing public water for drinking and other uses, therefore ingestion of contaminated groundwater is not anticipated. Two public supply wells located at Tanners Road are equipped with air strippers to treat the water. Despite the continuation of groundwater remediation, the groundwater contamination is expected to remain above standards for several years.

The excavation of soils/sludges from the former drywells up to 30 feet below grade would permanently eliminate the potential for access to them at the site. Additionally, continuation of SVE/catalytic incineration system provides for permanent removal of VOCs in the soils in the drywell area.

Currently sediments are under several feet of water in the three recharge basins. Sediment Alternatives 2

and 3 would provide long term effectiveness and permanence. Engineering and administrative controls such as fencing and deed restrictions are proposed for the recharge basins, therefore,the sediments contained in the basins would not become accessible for human receptor contact.

5. Reduction of Toxicity, Mobility or Volume.

Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

All remedial alternatives except alternative 4 would permanently reduce the mobility, toxicity and volume of the contaminants.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction etc.

Sediments Alternatives 2 and 3 are difficult to implement. The size of these recharge basins is relatively small when compared to typical project applications. Additionally, the three recharge basins are interconnected, total isolation of a particular basin to allow for excavation is not possible even if the storm water is diverted away to another basin. All other alternatives are implementable. Groundwater pump and treat and SVE systems are already successfully implemented.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision.

The costs for each alternative are presented in Table 7.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan (PRAP) have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting the following three alternatives as the preferred remedy for the site:

- Alternative 1A for the soil
- Alternative 2A for the groundwater
- Alternative 4 for the sediments

Alternative 1A for the soil:

This selection is based upon the fact that the selected remedial alternative has been successfully implemented as an interim remedial measure and has been operating since January 1994. The selected remedial alternative is capable of meeting the applicable ARARs and SCGs.

The mass of VOCs in the soil in the area of the drywells is estimated to have been on the order of 70,000 pounds. The quantities given are only estimates. To date, the SVE/catalytic incineration system has recovered and treated approximately 35,000 pounds of VOCs. In addition, approximately 1,000 pounds of VOCs will be recovered through excavation.

The estimated present worth cost to implement the remedy is $1,717,000. The cost to construct the remedy is estimated to be $1,036,120 and the estimated average annual operation and maintenance cost for 5 years is $138,808

The elements of the selected alternative are as follows:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

- As a means of source removal, the three drywells located on the east side of the southeast corner of the building will be excavated. Excavation will extend to a depth of approximately 30 feet below grade. Excavated soil will be transported to a permitted off-site treatment/disposal facility.

- Any structures, sludges or contaminated soils will be removed from the location of the other two drywells. Confirmatory soil samples will be collected.

- The system will be operated and maintained as per the Interim Remedial Measure - Soil Remediation Work Plan dated November 15, 1993 and all addenda approved by the NYSDEC.

- The existing SVE system will be examined, evaluated and modified or adjusted as needed to maintain effective operation of the system.

- The objective of the remedial alternatives is to achieve the remedial action objective and to reduce concentrations of organic compounds in soil to levels protective of groundwater quality standards.

- A request will be made to the NYSDEC to terminate operation of the SVE system when either the soil concentrations meet the site specific soil cleanup objectives, or when the SVE system is no longer effective in removing soil gas, whichever occurs first. The system will be shutdown, allowed to equilibrate, and restarted to determine if additional gas is available for removal. At such time, soil sampling will be conducted and compared to the site specific soil cleanup objectives to assess the adequacy of the source area remediation.

- Once the operation of this remedy is considered complete, the site will be monitored to confirm the effectiveness and permanence of the remedy.

Alternative 2A for groundwater

The selection of groundwater remedial alternative is based on cost because each of the groundwater

alternatives are capable of meeting applicable ARARs and SCGs except Alternative 2. The groundwater pump and treat system has been implemented as an IRM and has been operating since April 1993. Air stripping is also one of the most commonly used technologies for the removal of VOCs in groundwater.

The estimated present worth cost to implement the remedy is $18,641,00. The cost to construct the remedy is estimated to be $2,518,440 and the estimated average annual operation and maintenance cost for 30 years $615,300.

The elements of the selected remedy are as follows:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

- Based on groundwater model, it is estimated that a total of five extraction wells will be operated across the site extracting approximately 1,800 gpm.

- The selected treatment system will be evaluated after it becomes operational to determine if additional treatment of the effluent from the air stripper is needed.

- The objective of the remedial alternative is to achieve the remedial action objectives and to prevent constituent plume migration and reduce organic compound concentrations in groundwater.

- The selected remedial alternative targets the Glacial aquifer, and the upper and intermediate zones of Magothy for hydraulic control by pumping with treatment. This provides capture of contaminated groundwater down to a depth of approximately 270 feet below grade.

- Concentrations of contaminants in the lower Magothy are typically an order of magnitude lower than in the shallower aquifer zones.

- The selected groundwater extraction system will interdict further downward migration of contaminants. Therefore, active pumping of the lower Magothy aquifer is not proposed at this time.

- Pumping and water quality data will be monitored to determine the effects of the selected extraction system at all depths including the lower Magothy aquifer. After the selected remedial alternative becomes operational, it will be evaluated to determine if additional remedial alternatives for the lower Magothy aquifer need to be implemented. This issue will also be addressed as part of the Operable Unit 2 RI/FS.

- Over time, the selected remedial alternative would be evaluated by sampling both on-site and off-site monitoring wells to determine its ability to provide hydraulic control, to meet discharge standards, and to reduce on-site groundwater concentrations to the remedial action objectives.

Alternative 4 for the Sediments

This selection is based upon the implementability and cost benefits of the deed restriction alternative over the sediment dredging alternative and excavation alternatives. There is an added cost of approximately

$8.3 million associated with the hydraulic dredging alternative and an added cost of $7.2 million associated with the sediment excavation alternative. However, the less costly alternative of land use and institutional controls such as deed restrictions, fencing and posting of signs to prevent access to this area will be sufficiently protective of human health and the environment. Currently public safety is the major threat from the recharge basins, as they represent physical hazards. The selected remedy will control access to the recharge basins.

This alternative will also include groundwater monitoring near the recharge basins to ensure that the groundwater will not be impacted by the presence of contaminated sediments in the basins. This alternative will comply with ARARs and SCGs for groundwater since contaminants in the basins have not impacted groundwater. The primary contaminants of concern in the recharge basins are metals, and the groundwater downgradient of this area has not shown any indication of metals impact. This alternative can be readily implemented and is the most cost effective remedy of the alternatives evaluated for the basins.

The estimated present worth cost to implement the remedy is $1,345,000 The cost to construct the remedy is estimated to be $1,258,500 and the estimated average annual operation and maintenance cost for 5 years is $3,300.

The elements of the selected remedy are as follows:

- Under this remedial alternative, the water and sediments will remain in the three recharge basins on-site.
- A deed restriction will be imposed on the portion of the site where the recharge basins are located to limit access to the basins and restrict future use of the site.
- A Declaration of Covenants and Restrictions will be filed with the Nassau County Clerk to prohibit modifications to the site without NYSDEC approval to prevent potential future development on the basin property.
- Institutional controls such as a security fence will be constructed around the entire recharge basin property to prevent unauthorized access to this area.
- The fence will be inspected routinely and repaired as needed to ensure the integrity of the fence.
- The site will be posted in clearly visible manner indicating that the contaminated materials are present and the trespassing, swimming and fishing are prohibited.
- Groundwater monitoring will be performed to evaluate the effectiveness of this alternative. One new monitoring would will be installed downgradient of the basins. This new well, and one of the existing downgradient wells will be sampled semiannually for two years.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform the public and receive information about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A site- specific citizen participation plan was developed and approved for this site.

- Two repositories for documents pertaining to the site was established in the Hillside Public Library and Parkville Branch Library in New Hyde Park. In addition, a repository was established at the NYSDEC Region 1 office in Stony Brook, New York.

- A site mailing list was established, which included nearby property owners, local residents, local Water Districts, elected and appointed political officials, civic and environmental groups,local media and other interested/affected parties.

- NYSDEC conducted a public availability session/meeting was held in August 1993 to present Remedial Investigation/Feasibility Study (RI/FS) Work Plan to the concerned citizens and to receive comments.

- A information meeting was held in June 1994 at the Village of Lake Success Hall , New York with the Environmental Committee of the Great Neck Village Officials Association to discuss the IRMs and RI/FS for the site.

- Fact sheets were mailed out in August 1993, December 1996, and January 1997 to keep the public informed of activities occurring at the site.

- In January 1997, NYSDEC conducted a public meeting was held to present the Proposed Remedial Action Plan (PRAP) to the public and receive comments.

- A information meeting was held on February 20, 1997 at the Village of Great Neck Plaza, New York with the Public Officials to discuss the Risk Assessment, Feasibility Study and the PRAP.

- The public comment period for the PRAP extended from February 22, 1997 to March 7,1997.

- In March 1997 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

APPENDIX A

RESPONSIVENESS SUMMARY
LOCKHEED MARTIN TACTICAL SYSTEMS, INC.
(Formerly Unisys Corporation)
SITE No. 130045

This document summarizes the comments and questions received by the New York State Department of Environmental Conservation (NYSDEC) regarding the Proposed Remedial Action Plan (PRAP) for Operable Unit 1 (OU- 1) for the Lockheed Martin Tactical Systems, Inc. (Lockheed Martin) site. A public comment period was held between January 23, 1997 and February 21, 1997 to receive comments on the PRAP. The public comment period for the PRAP was extended from February 22, 1997 to March 7, 1997. A public meeting was held on January 29, 1997 at the Great Neck South Middle School Auditorium, Great Neck. The purpose of the meeting was to present the PRAP for OU - 1 and receive comments on the PRAP for consideration during the final selection of a remedy. An information meeting was also held on February 20, 1997 at the Village of Great Neck Plaza with the public officials to discuss the Risk Assessment, Feasibility Study and PRAP for OU-1 for the site.

The comments received during those meetings, as well as written comments and questions received during the public comment period, have been grouped together and responded to in this Responsiveness Summary. The remaining issues are addressed individually. The issues raised have been grouped into the following general categories: (I) Consent Order issues (II) On-site groundwater contamination issues (III) Off-site groundwater contamination and public supply wells issues (IV) On-site recharge basins issues (V) On-site soil contamination issues (VI) Proposed Remedial Actions issues (VII) Health issues (VIII) Citizen Participation issues, and (IX) Miscellaneous

I. QUESTIONS RELATING TO CONSENT ORDER:

Question 1:

An independent core community group should be made part of the Consent Order process modeled after the Port Washington Landfill Superfund site Citizens Advisory Committee. We would like to see what actually is being consented by the NYSDEC and Lockheed. Can our representatives look at the Draft Consent Order?

Response:

Negotiations for Consent Orders are strictly between responsible parties and the NYSDEC. Once the Consent Order is signed by both parties, it then becomes a public document.

Question 2:

Is Lockheed responsible for remediating all of the damage? They should deal with the entire area, as should the Department of Health and the Department of Environmental Conservation.

Response:

The NYSDEC and Unisys Defense Systems, Inc. entered into a Consent Order Index # W-1-0527-91-02 which covers Remedial Investigation/ Feasibility Study and Interim Remedial Measures (IRM) for this site. On July 11, 1995, Loral Corporation agreed to implement the obligations under the Order. Effective July 23, 1996, Lockheed Martin Tactical Systems, Inc. undertook the obligations of the aforementioned Consent Order. Negotiations for a Consent Order to implement the selected remedy for on-site contamination are underway with Lockheed Martin Tactical Systems, Inc. Lockheed Martin is also responsible for remediating off-site contamination. Negotiation for an Order on Consent to remediate off-site contamination will begin after a PRAP for the off-site contamination is prepared by the Department.

Question 3:

Is Lockheed Martin obligated to implement the Consent Order signed by Unisys ? Did it include the costs of any extensive additional work that has to be done in order to satisfactorily clean up the mess that we have in this area? Is there any type of monetary cut off or limit if additional work is necessary? Is that amount open ended or is there a finite amount that they are responsible for?

Response:

There are no limits or monetary cut off in the Consent Order signed by Unisys.

Question 4:

What is the protection of the public in terms of hard contractual obligations by the people who are the present owner of the site and anybody else who takes over in the future? There is no Consent Order for remediation so the public is vulnerable until then. What happens if Consent Order is not signed? Are there funds available? Who are the responsible parties?

Response:

If the Consent Order is not signed between the NYSDEC and Lockheed Martin, then the NYSDEC has the option to use State Superfund money to continue investigation and remediation of this site and then recover the money from the responsible parties. Under Federal and New York State

environmental laws, the current owner and operator of a site and the owners and operators at the time any hazardous waste disposal occurred are responsible for the environmental problems related to a site.

Question 5:

What happens when site is sold to others who have no commitment toward protecting the public? What safety factors can you offer the public with respect to what will happen after that? Who will do enforcement and monitoring? If somebody takes over the property, does the new owner become responsible to implement the Consent Order or is Lockheed still responsible until onsite and offsite is remediated? What happens when the redeveloper comes and starts to bulldoze the buildings?

Response:

Any change in ownership or corporate status of the party signing the Order including, but not limited to, any transfer of assets or real or personal property does in no way alter responsibility of the party who signed the Order. However, as part of a purchase agreement, a new owner may agree to be responsible for implementing the Consent Order

Question 6:

A speaker commented that Consent Orders are not necessarily signed right away. Consent Order do not necessarily hold up remediation work and sometimes Consent Orders are signed well into the remediation process.

Response:

A signed Consent Order is required by the NYSDEC before we provide remedial oversight for work at hazardous waste sites such as the Lockheed Martin site.

Question 7:

Does a time table come with a Consent Order?

Response:

Yes.

Question 8:

Do deed restrictions means that Lockheed will forever own that property, or that a duty is placed on the subsequent owner?

Response:

The terms of the deed restrictions are being negotiated by the Department.

II. QUESTIONS RELATING TO ON-SITE GROUNDWATER CONTAMINATION:

Question 9:

Alternative I, Pump and Treat Using Carbon Absorption states that treated groundwater would be recharged on-site. Will the treated water be recharged back into the aquifer it was drawn from? What is the quality of the treated water that is being re-injected?

Response:

Water treated to New York State groundwater water standards will be discharged through diffusion wells located on the Lockheed Martin property. This clean water will be recharged back to the aquifer from which the water was extracted.

Question 10:

A speaker read the 1993 report referring to the consulting firm of Leggete, Brashears and Graham, Inc. (LBG) which discusses a particle study that was in the report and asked if such a study has been conducted. Was the remediation plan changed after LBG left and H2M took over?

Response:

A Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan prepared in 1993 by Unisys includes previously prepared groundwater models of the site. As part of the RI/FS, a groundwater flow model was in fact constructed and the results of this model are presented in Appendix F of the 1997 FS report. The purpose of the model was to help develop an effective groundwater extraction/re-injection system for OU -1. Remediation plans for the site have not changed due to a change in consultant by the responsible party. The two IRMs for on-site soils and groundwater have been implemented and are ongoing. The PRAP prepared by the Department for the OU- 1 has been developed after completion of the RI/FS. Additionally, a RI/FS Work Plan to address off-site issues (OU-2) is being prepared. The public will have an opportunity to comment on this OU-2 Work Plan in the near future, prior to its final approval by the NYSDEC.

Questions 11:

The groundwater IRM has been in operation approximately four years, since April 1993, and to date has treated approximately 840 million gallons of water. During a meeting with the Great Neck

Village Officials, we were also told that the pump and treat system was pumping at a rate of 850 gallons per minute (gpm) and plans were being developed to increase that amount to 1,800 gpm. However, if this rate were pumped as stated continuously for four years with short periods of shut down for repairs, approximately 1,768 million gallons of water would have been treated, approximately two times the 840 million gallons stated above. Therefore, should we assume the down time for the pump and treat system is approximately 50%? If not, please explain the calculation for the pump and treat system.

Response:

The 840 million gallons of groundwater treated referenced in the Feasibility Study report was through September 1996. The pump and treat system was put in operation as an interim remedial measure for the period of investigation. The pumping rate over the past years has varied since the onset of the project because of the need to perform maintenance, change carbon and to determine the best pumping patterns and flows. The average pumping rate since the start-up of the pump and treat system has been 480 gallons per minute. Currently, the groundwater IRM system is operating at approximately 850 gpm.

Question 12:

Will the groundwater extraction/treatment system capture contamination at the well depth of 350 feet below grade ? If the system is not designed to capture groundwater at that depth, please explain the rationale.

Response:

The selected remedial alternative provides capture of contaminated groundwater down to a depth of approximately 270 feet below grade. The selected remedial alternative targets the Glacial aquifer and the upper and intermediate zones of the Magothy. The selected groundwater extraction system will interdict further downward migration of contaminants. Therefore, active pumping of the lower Magothy is not proposed at this time. Pumping and water quality data will be monitored to determine the effects of the selected extraction system at all depths including the lower Magothy aquifer. After the selected remedial alternative becomes operational, it will be evaluated to determine if additional remedial alternatives for the lower Magothy aquifer need to be implemented. This issue will also be addressed as part of the RI/FS for OU- 2.

Question 13:

Describe the process whereby contamination will degrade by natural attenuation. Will this occur by chemical or microbial degradation or dilution and dispersion of pollutants in the groundwater? Will the natural attenuation process cause off-site contamination to increase over time? Will there be natural attenuation of contamination in the lower Magothy aquifer? Has the model been used to determine the effects of natural attenuation of contamination in the lower Magothy aquifer? Have

projections been made, using a model or other methods, to estimate the final extent of the plume and the time it will take for contamination to degrade to drinking water standards?

Response:

Natural attenuation is a process that depends on in-situ conditions to degrade and dissipate contaminants. The process involved in natural attenuation includes aerobic and anaerobic biodegradation, chemical breakdown, dispersion, volatilization and adsorption. While the entire aquifer system was studied, the purpose of the model was to help develop an effective groundwater extraction/re-injection system for the Upper Glacial and intermediate Magothy aquifers. The rate of natural attenuation in the lower Magothy aquifer was not modeled as part of the study. There will be some natural attenuation of VOC contamination in the lower Magothy aquifer. The implementation of the selected groundwater treatment system will interdict further downward migration of contaminants. With the implementation of an expanded groundwater treatment system and ongoing soil remedial actions at the site as well as by natural attenuation, the overall concentration in groundwater is expected to decrease over the course of the next several years. The final extent of the plume will be delineated as part of the RI for OU-2.

Question 14:

A speaker noted that the 1993 report stated hydraulic conductivity values were approximately 240 and 50 feet per day for the Upper Glacial and Magothy aquifers, respectively. It may have implied that these were in fact groundwater flow velocities.

Response:

Hydraulic conductivity (K) is one of the hydraulic characteristics of an aquifer. It is a measure of the aquifer's ability to conduct water under a given hydraulic gradient. It is used to calculate groundwater flow velocity, but is not in fact the actual flow velocity.

Question 15:

It is not stated in the Appendix F of the Feasibility Study that the pumping capacity of 1800 gpm will keep the groundwater on-site.

Response:

The purpose of the model was to help develop an effective groundwater extraction/re-injection system for the Upper Glacial and intermediate-depth Magothy aquifers to provide hydraulic control of contaminated groundwater on site. In this scenario, the majority of on-site contamination is captured from the Upper Glacial and intermediate-depth Magothy aquifers. Pumping and water quality data will be monitored to determine the effects of the extraction system at all depths including the lower Magothy aquifer. After the 1800 gpm system becomes operational, it will be

evaluated to determine if additional remedial alternatives for the lower Magothy aquifer need to be implemented. This issue will also be addressed as part of the RI/FS for OU-2.

Question 16:

How was water on site pumped from and discharged to the Magothy aquifer ? What were the findings of the diffusion test conducted on diffusion well DW-5?

Response

The IRM groundwater system is connected to a total of five pumping wells which consists of three extraction wells and two recovery wells. Treated water is discharged through four diffusion wells located on the Lockheed Martin property. Results of the recharge test performed on DW-5 indicated that the radius of "upconing" influence from the diffusion well was approximately 35 to 50 feet; based on an injection rate of 800 gpm. The transmissivity of the aquifer in the vicinity of DW-5 is approximately 80,000 to 90,000 gpd/ft.

III. QUESTIONS RELATING TO OFFSITE GROUNDWATER CONTAMINATION AND PUBLIC SUPPLY WELLS IN THE AREA:

Question 17:

A speaker noted that Manhasset-Lakeville water District is privately owned and asked to reflect that in the DEC's documents.

Response:

Manhasset-Lakeville Water District is not privately owned. It is a public water system.

Question 18:

A speaker stated that the three wells owned by Manhasset-Lakeville Water District located north of the site that are pumping water are possibly pulling the plume away from the Lockheed Martin site. Are these wells pumping at a greater rate than the wells located at the Lockheed Martin site? The plume of contamination is moving at one half a foot per day. The plume is moving faster and is being brought further north by pumping of the Manhasset-Lakeville wells. If NYSDEC cannot stop some of this pumping, then Manhasset-Lakeville Water District should try to stop some of the pumping from these three wells, so the plume can be attracted back toward Lockheed Martin site faster.

Response:

The pump and treat system at the Lockheed Martin site was implemented as an IRM and currently treats approximately 850 gpm. The implementation of the selected groundwater treatment system at the site will pump and treat 1800 gpm and will run continuously. The design capacity of the Manhasset-Lakeville Water District treatment plant, located at Tanners Road, is 2600 gpm. They usually shutdown for winter, because of the cost. The two public supply wells located north at Tanners road are approximately 2000 feet away from the site. All other issues will be considered during RI/FS for OU-2.

Question 19:

Lake Success is located approximately 1,600 feet north of the site and appears to be in direct line with the flow of water from the Lockheed site. (A) Has the evaluation of Lake Success relative to the Lockheed site been verified? If so, what is the difference in elevation? How many years will it take the plume of contamination to get to the Lake Success? (B) Has the depth of Lake Success been determined? (C) What contaminants, if any, were found in the lake? What were the levels, if any? (D) How often will the lake be checked for possible contaminants?

Response:

(A) Although Lake Success is located in the direction of groundwater flow from the Lockheed Martin site, the plume is at a depth which may be well below the lake bottom and therefore may not impact the lake itself.

(B) NYSDEC fisheries personnel estimate the depth of Lake Success as 65 - 70 feet. Lockheed Martin has determined the depth of Lake Success to be about 75 feet.

(C) Surface water and sediment samples were collected from Lake Success in August 1995 and analyzed for volatile organic compounds (VOCs). Acetone was detected in one of three water samples at a concentration of 2 ppb. Acetone and 2-butanone were detected in the sediment samples at concentrations ranging from 9 ppb to 350 ppb for acetone and 18 ppb to 120 ppb for 2-butanone. These contaminants are not related to the Lockheed Martin site. These analytical data are presented as Table 5 of the Supplemental RI Report (December 1996). Water and sediment samples were recollected from Lake Success and analyzed on February 21, 1997 for VOCs and metals. The results of water samples indicate that there were no VOCs present. However, zinc and lead were present at levels well below the New York State standards. The results of the analysis of the sediment in Lake Success indicate the presence of acetone and 2-butanone. These contaminants do not reflect the type of VOCs present in the groundwater plume emanating from the Lockheed Martin site. The results of the metals analysis of sediment show the presence of arsenic, chromium, mercury, lead, zinc, copper and nickel. These metals are present at levels above New York State recommended soil cleanup objectives. The presence of metals in sediments do not reflect the VOC profile of the groundwater plume emanating from the Lockheed Martin site.

(D) As contaminants found in the Lake Success during two rounds of sampling are unrelated to the site, Lake Success will not be monitored in the future.

Question 20:

Please advise if any of the owners of the private, industrial and municipal off-site wells, including golf course and air conditioning wells surveyed were notified of the survey and were they provided with a copy of the results? In addition, please provide the Water Authority with the location and the levels of the contaminants of concern found in the off-site municipal, industrial and monitoring wells located within the surveyed area of the Lockheed Martin site.

Response:

The well survey and data review conducted by Lockheed Martin (then Unisys) was conducted for off-site domestic, industrial and municipal supply wells. The survey included a review of water quality results and well records from the Nassau County Department of Health (NCDH), Nassau County Department of Public Works (NCDPW), and the New York State Department of Environmental Conservation (NYSDEC) offices. No owners of wells were contacted by Lockheed Martin. The results of the survey were used to prepare Figure 2 and it includes the most recent water quality data available at the time the well survey was performed.

Question 21:

Public Supply Well N-1802 is currently receiving treatment and the levels of contamination per NCDOH have decreased. (A) Has any determination been made that Well N-1802 was contaminated as a result of Lockheed? (B) What are the current levels of contamination for Well N-1802? Well N-1802 is a Lloyd well. (C) Has the Lloyd aquifer been subjected to contamination from the Lockheed site?

Response:

(A) The contaminants found in N-1802 are similar to those associated with the Lockheed Martin site. Contamination in this well was a result of a hole in the well casing allowing contaminants from the Magothy Aquifer to be drawn downward by the pumping well. The well was repaired at Unisys's expense.

(B) Well N-1802 has not been used extensively the past few years. Over the past four years, well N-1802 was only used in July and August of 1996. All wells in Nassau County which have treatment systems, such as N-1802 which has granular activated carbon (GAC) treatment, must be sampled monthly. For the months of August and September 1996, the sampling results for the raw well water are as follows:

PARAMETER	*SAMPLING DATA 7/29/96 (PPB*)*	*SAMPLING DATA 8/27/96 (PPB*)*
Cis 1,2 dichloroethene	18.0	9.7
Trichloroethene	8.1	4.9
Tetrachloroethene	4.5	2.6
All other Principal Organic Contaminants (50)	ND**	ND**

* Parts per billion
** Not detectable

~~There were no detectable contaminants in the treated water.~~

(C) The NYSDEC does not believe that the Lloyd aquifer has been subjected to contamination from supply well N-1802; contamination that migrated downward through the casing would have been captured by the pumping well.

Question 22:

As the contaminated groundwater moves north, exposures could occur in northerly located public and private wells therefore, placing the Water Authority's wells at risk. Has any consideration been given to assist the Water Authority with the necessary corrective action that may be needed in the future?

Response:

Off-site contaminant issues will be investigated further during the RI/FS for OU- 2. At this time, the groundwater plume does not appear to be putting Great Neck North Water Authority wells at risk.

Question 23:

Is the monitoring well network extensive enough to monitor the remediation of the plume? What is the testing frequency and analyses conducted?

Response:

The current monitoring well network includes 59 groundwater monitoring wells which includes 47 on-site and 12 off-site monitoring wells. Particularly, the monitoring wells located along Marcus

Avenue and the Northern State Parkway are sufficient to monitor the effectiveness of the OU-1 groundwater treatment system. For the current IRMs, the monitoring well network is sampled semi-annually and tested for Halogenated VOCs.

Question 24:

The semi-annual sampling of the groundwater monitoring well network to evaluate the effectiveness of the extraction system is of concern due to the length of time between sampling. Public supply wells would be required to monitor at a minimum of quarterly sampling. Are the levels of contamination low enough in the area to warrant the reduced sampling criteria of semi-annually or should some consideration be given to increasing the requirement to either monthly or quarterly sampling?

Response:

~~The monitoring program described in the remedial action for groundwater~~ will be conducted on a quarterly basis. More frequent sampling will be required during start-up of the groundwater remediation system to evaluate hydraulic control and plume capture. Additionally, the pump and treat system and soil vapor extraction system are sampled twice monthly. The results are reported to the NYSDEC monthly.

Question 25:

The Water Authority of Great Neck North is currently working on developing two new supply wells off of the Great Neck peninsula, specifically located within the Whitney Estate property. In addition, the Authority has three supply wells northwest of the Lockheed property. Therefore, the Authority is requesting a response to the above to help us develop and protect our supply. The Water Authority is concerned with both on-site and off-site remediation. Please provide the Authority with a map of all test wells, including sampling data, and if the outer parameters of the plume have been identified. Also, please advise what assistance is available to offset the costs associated with our investigative process.

Response:

Off-site groundwater contamination has not been delineated. This will be done as part of the RI for Operable Unit 2. Maps showing the locations of Lockheed Martin's test well are shown in Figures 2 and 5 of the PRAP. Additional copies of the site maps and any other maps, other than those in the RI and Supplemental Reports, can be requested from Lockheed Martin directly.

Question 26:

The separation of the remediation plans into on-site and off-site segments has the potential to

threaten the Public Supply wells by failing to address the contamination in its entirety. Nobody is doing any off-site investigation at this point and plume is expanding. Nobody is stopping this plume from moving. The Department is sticking solely to the Lockheed Martin site. When will off-site work start? Who is going to clean that plume up? Are we as taxpayers going to be cleaning that plume up or is Lockheed going to take on that responsibility of cleaning up?

Response:

NYSDEC has found that the remedial response at some sites is so complex that it is more efficient to subdivide the remedial response into smaller segments or operable units. A separate and distinct RI/FS, design and construction project is carried out for each operable unit. Often, subdividing a project into operable units can result in implementing remediation more quickly. In this case, it made sense to subdivide the project into on-site work (OU-1) and off-site work (OU-2) because the responsible party was in control of all on-site resources which resulted in quick implementation of two remediation systems on-site. The off-site work will require access agreements to be made to install monitoring wells and future possible remediation systems. However, some of the off-site work which has already been completed includes installation of 12 off-site monitoring wells, sampling of off-site wells, completion of a well survey and data review for domestic, industrial and municipal wells located within 1.5 mile radius of the site, collection and analysis of samples from Lake success, and investigation and repair of Public Supply Well N-1802.

After the consent order for remedial work is signed for OU-1, the implementation of 1800 gpm groundwater treatment system is expected to significantly improve groundwater conditions associated with off-site (OU-2).

Lockheed Martin has already directed its consultant to prepare a work plan for the off-site Remedial Investigation.

Question 27:

While we understand the need to address on-site problems first, where the concentration of contaminants are greatest, the extent, direction and rate of flow of the existing underground plume should be determined as soon as possible. Additional monitoring wells may need to be installed. Particle and other studies, as suggested in the 1993 Unisys remediation plan, should be initiated to determine the effectiveness of the current aquifer remediation practices. Simultaneous design plans should be made to remediate off-site.

Response:

Lockheed Martin has already directed its consultant to prepare a work plan for the off-site Remedial Investigation. Off-site groundwater contamination issues will be investigated during the RI/FS for OU-2. The NYSDEC will consider all comments received regarding off-site during the review process of the RI/FS for OU-2. The off-site work will begin as soon as the NYSDEC approves the

RI/FS work plan for OU-2.

Question 28:

Given the close proximity of the North Hills Special Groundwater Protection Area (SGPA), the groundwater treatment system should be designed and operated to contain any off-site migration of groundwater contamination which exceeds N.Y.S. drinking water standards.

Response:

The objective of the groundwater remedial alternative is to achieve the remedial action objectives and to prevent plume migration and to reduce concentrations of VOCs in groundwater.

Question 29:

Will the OU-2 investigation include an overview of local groundwater dynamics, including the impacts of pumping municipal public supply wells within 1.5 mile radius, to show their capture zones, cone of depression and impacts on groundwater flow direction. Information from USGS should be part of OU-2. Develop a computer model for off-site.

Response

All issues raised above and other issues related to off-site will be considered by the Department during the review process of RI/FS for OU-2.

Question 30:

How might the presence or absence of TCE and 1,2 DCE in groundwater indicate other possible sources of PCE?

Response

PCE, TCE and 1,2 DCE have been detected over the last several years in on-site wells and off-site wells located downgradient, as well as some side gradient and nearby wells up gradient to the Lockheed Martin site. Therefore, absence of TCE and 1,2 DCE and presence of only PCE may indicate that there are other sources of PCE in the area. This issue will be evaluated during RI/FS for OU-2.

Question 31

What are the contamination levels in off-site wells ? There is no mention that the contamination did not travel southeast many years ago due to public supply well No. 40 (N-4390) operated by the Jamaica Water Supply and subsequently closed in the 1980s due to extreme contamination.

Response

PCE, TCE and 1,2 DCE have been detected over the last several years in off-site wells located downgradient, as well as some side gradient and nearby wells up gradient to the Lockheed Martin site. Based upon analytical results, PCE,TCE and 1,2 DCE were found in groundwater samples at concentrations exceeding NYS groundwater standards. The highest concentrations were detected in wells located within ½ mile north of the site. Concentrations in wells located between a ½ and 11/2 miles of the site, in all directions,were significantly lower. Results for the groundwater quality are provided in the Phase I RI report and Supplemental RI report prepared in December 1996. The issues related to the off-site will be evaluated during RI/FS for OU-2.

IV. QUESTIONS RELATING TO ONSITE RECHARGE BASINS:

Question 32:

Surface water and sediment samples were collected from the three on site recharge basins. During the last round of sampling of the surface waters, no VOCs were detected in any of these water samples and none of the metals were detected above NYSDOH public drinking water supply standards. However, no reference was made as to what happened to the levels of SVOCs, pesticides and PCBs in the last round of samples. What were their levels, if any?

Response:

During first round of sampling conducted at the recharge basins, SVOCs, pesticides and PCBs were not detected in the surface water samples. Therefore, during the last round of sampling, the surface water samples were analyzed for VOCs and metals only. No VOCs were detected in the surface water samples. Zinc was the only metal detected in all three of the water samples collected from the recharge basins, at concentrations of 40 ppb and 50 ppb. Results for the first round of recharge basin water samples are tabulated in Tables 6.1 and 6.2 of the Phase I RI Report. Results for the last round of recharge basin water samples are tabulated in Tables 10 and 11 of the Supplemental RI Repot.

V. QUESTIONS RELATING TO ONSITE SOIL CONTAMINATION:

Question 33:

When will the soil remediation start? Why could it not have been started before? Why was the excavation not done earlier so that soil vapor extraction would be more effective? What is going to stop that plume being fed by VOCs? Wouldn't you have accomplished more sooner by doing so? Did waste water disposed in the drywells spread out more than 10 feet?

Response:

Excavation of soil/sludge from the drywells down to a depth of 30 feet will start after the Consent Order for remedial work for Operable Unit 1 is signed between the NYSDEC and Lockheed Martin. The soil remediation in the drywell area through soil vapor extraction system began three years ago and currently remediation is continuing. To date, 35,000 pounds of VOCs have been removed from the drywell area and the SVE system is helping to reduce the rate of VOCs leaching in to groundwater. In the drywells, soils are not only impacted just by VOCs, but are also impacted by metals and is another reason why the soils will be excavated. The SVE system has done a very good job in removing VOCs. The wastewater disposed in the drywells did spread out more than 10 feet but the SVE wells are extracting those VOCs.

Question 34:

Which reports contain soil sampling locations? Were any samples collected within the building?

Response:

The Phase I Remedial Investigation Report and Supplemental Remedial Investigation Report prepared in December 1996 contain the requested information. A soil sample was collected below the reclamation room slab inside the building. VOCs were found below the NYSDEC recommended soil cleanup objectives. The reclamation room is located adjacent to the former drywells in the south-east corner of the main building.

Question 35:

Concerns were raised regarding the use of cadmium and other metals in plating operations that were conducted in a plating area and any soil contamination underneath the buildings.

Response:

The plating operations were conducted between 1940 and 1960s. The plating line included three concrete-lined, impervious acid-proof mastic coated sumps which were drained to a neutralizing basin. The neutralized effluent was routed to the sanitary sewer. In the late 1960's, the plating operation was dismantled and the sumps were cleaned, backfilled with sand, and covered with a 6 inch-thick concrete slab. The original concrete lining and mastic were left intact. The groundwater quality data indicated that metals concentrations in all monitoring wells, with the exception of one upgradient well, were below NYS groundwater quality standards. Cadmium was detected above standards in an upgradient well. Lockheed Martin's future plans (probably within next year) include drilling selected areas in the foundation under the building to verify that no cadmium or other heavy metals penetrated the concrete floors. Lockheed Martin will have samples from the drilling analyzed and provide the results to NYSDEC. When Lockheed Martin begins closure of the facility, under RCRA regulations, they will further investigate soil contamination.

VI. QUESTIONS RELATING TO PROPOSED REMEDIAL ACTIONS:

Question 36:

Why not implement Alternative 2B or 3 for Groundwater rather than Alternative 2A ?

Response:

All three alternatives are capable of meeting applicable ARARs and SCGs. Due to the very high cost ($28.7 million), Alternative 3 was not selected. The cost of Alternative 2A is $ 18.6 million compared to Alternative 2B which would cost $ 19.8 million to implement.

Question 37:

Why not implement Alternative 1B rather than Alternative 1A for soils ? Emissions (soil gas) should be treated with carbon.

Response:

Alternative 1B is similar to Alternative 1A except that off-gas emissions will be treated using regenerative vapor phase carbon. Also, the soil and sludge removal program will be identical for both Alternatives 1A and 1B. The SVE/Catalytic incineration portion of Alternative 1A has already been successfully implemented as an IRM and has been operating since January 1994.

Question 38:

Have you considered pumping hot air into the contaminated soil in the dry well area to ease the release of VOCs from the soil to accelerate the removal of contaminants?

Response

The current SVE/ incineration portion of Alternative 1A has already been successfully implemented and the current system has treated approximately 35,000 pounds of contaminants. This system is a proven technology and there is no need to supplement it with other technologies.

Question 39:

Why not implement hydraulic dredging and removal for recharge basins sediment rather than the deed restriction alternative ? The area should be remediated and left clean. It is unacceptable to choose deed restrictions/administrative controls for such a valuable property for far into the future.

Response:

The selection of the deed restriction alternative for sediments over hydraulic dredging is based upon the implementability and cost benefits. There is an added cost of $8.3 million associated with the hydraulic dredging alternative. Hydraulic dredging alternative is difficult to implement. The primary contaminants of concern in the recharge basins are metals, and the groundwater downgradient of this area has not shown any indication of metals impact. The deed restriction alternative will be sufficiently protective of human health and the environment.

VII. QUESTIONS RELATING TO HEALTH ISSUES:

Question 40:

A possible contradiction was noted in the Baseline Risk Assessment with regards to selenium.

Response:

The list of 18 indicator compounds on Page 3-5 which included selenium was in error, selenium should be replaced by silver. Silver was included throughout the quantitative human-health risk evaluation.

Question 41:

Can we be exposed to contaminants that migrate up through the soil from the groundwater?

Response:

Based on our review of the on-site investigation done at the Lockheed Martin site to date, we do not believe that exposures are occurring to the surrounding community as a result of the past disposal of hazardous waste at the site. Investigations conducted at the site have shown that contamination is limited to the subsurface soils in the on-site dry well area located in the southeast corner of the site, the sediments in the on-site recharge basins and also the groundwater beneath the site. Because contaminated groundwater is present more than 75 feet below grade, it is highly unlikely that there would be any exposure to contaminants volatilizing (evaporating) out of the groundwater. Although it is likely that elevated levels of contaminants in groundwater will volatilize at those depths into the air spaces (soil gas) between particles in the soil above the groundwater, we don't believe that contaminated soil gas is present at the ground surface at off-site locations. We believe this based on the results of the on-site investigation which show only elevated levels of soil gas in and near the former disposal area. A test was conducted to measure emissions of VOCs from soils in the vicinity of the drywell area. Results of the test indicate that VOCs are not being emitted from the subsurface of the drywell area. The drywell area is currently being remediated by SVE/Catalytic incineration system. The review of off-site soil gas samples collected from the vicinity of Marcus Avenue do not indicate that contaminated soil gas is present. NYSDOH will continue to evaluate the surrounding communities for potential exposure to site chemicals as the off-site investigation of

groundwater proceeds.

Question 42:

The Mayor of the Village of Great Neck has concerns that chemicals in the contaminated groundwater plume are evaporating into the soil gas and possibly accumulating in the indoor air of nearby schools.

Response:

As stated in the previous response, we do not believe the soil gas is migrating up from the groundwater plume to the surface at off-site locations. In addition, the NYSDOH and the NYSDEC investigated the possibility that contaminants in groundwater may have impacted the indoor air of two schools in the Garden City School District. The schools evaluated were in the general direction of groundwater flow from the Pasley Solvents and Chemicals and the Roosevelt Field inactive hazardous waste sites. It is noted that the highest concentrations of chemicals in groundwater at the Pasley Solvents and Chemicals site were found at about thirty feet below ground surface. No chemicals were detected in those soil gas samples from the two schools. With this information, we do not believe that the indoor air of schools or other off-site buildings in the direction of the groundwater plume from the Lockheed Martin site will be affected by chemicals in the plume.

Question 43:

There appears to be a high rate of breast cancer and other cancers in the Lake Success area.

Response:

The NYSDOH has not evaluated health outcome data such as the incidence of cancer near the Lockheed Martin site. However, the possibility of detecting an increased cancer incidence related to the site is small because the cancer risks associated with chemicals from the site are expected to be low. In 1990, the NYSDOH reported on breast cancer incidence rates for small geographic areas of Nassau and Suffolk Counties. The relationship between breast cancer incidence and contaminated drinking water wells and hazardous waste sites was also examined. No association was found between breast cancer incidence patterns and contaminated drinking water wells or hazardous waste sites. The study mapped out incidence rates by water districts and communities.

NYSDOH is developing a registry which will look at potential exposures to volatile organic compounds (VOCs) in drinking water. NYSDOH will consider including those residents near the Lockheed Martin site in this proposed registry.

Question 44:

There are concerns that there may be risks to future site occupants. There are also concerns about

security at the site in the future.

Response:

The NYSDOH has been responsible for determining the potential for human exposure to chemicals found at the Lockheed Martin site. The NYSDOH feels that the site has been thoroughly investigated for OU-1 (on-site investigation) and believes that the proposed site remedies will minimize or eliminate human exposures from occurring in the future.

Additionally, if someone were to occasionally trespass on the site, it is very unlikely that they will come in contact with site chemicals that are restricted to the sediments in the recharge basin, subsurface soils in the dry well area and the groundwater beneath the site. At this time, we are not aware of unauthorized persons entering the site.

Question 45:

A statement was made by two nearby residents of the site that we understand that the public is not being exposed to any additional risks. But we have lived in the Manhasset-Lakeville Water District since 1956, and raised two children in the area, who went to the South Middle/High School Complex. What contaminants were found in the wells that Manhasset-Lakeville closed, and subsequently reopened? What symptoms could such contaminants cause (after short-or long-term water usage), either physical or mental (neurological)? What should we, and our grown sons, be aware of ? Have doctors in our area been advised to be on the alert, and report suspicious cases?

Response:

The Manhasset-Lakeville Water District, as with any other supplier of public drinking water in New York State, must adhere to monitoring requirements and maximum contaminant level (MCL) standards as mandated under the statutory authority of New York State's Public Health Law, Section 225, Part 5. These standards are designed to protect against possible health effects from long-term exposures to chemicals in sources of drinking water. The district currently operates a system of 18 public supply wells each of which may be placed on or off-line depending on demand. Ten of the 18 supply wells were taken out of service at various times in the past after monitoring revealed detections of one or more volatile organic compounds (VOCs). Eight of those wells were placed back into service with treatment to remove VOCs and are providing water that meets current drinking water standards. The other two wells remain out of service. Therefore, there are currently no exposures to chemicals at levels above drinking water standards.

The chemicals have been detected in the water prior to treatment and distribution, but are not found at levels exceeding drinking water standards in the water that is supplied to Manhasset-Lakeville customers.

One of the New York State Department of Health's goals has been the reduction of exposure to

organic chemicals in drinking water. In 1977 this goal was originally expressed through recommended guidelines and later in 1989 as strict and enforceable general organic chemical standards (or Maximum Contaminant Levels, MCLs). The New York State Drinking Water standards are among the most comprehensive and protective in the world and are applied at each individual well as a source of public drinking water. Overall, public drinking water systems on Long Island have taken a conservative approach to comply with these MCLs by shutting down any questionable wells prior to a chemical reaching the MCL. There have been no MCL violations in Nassau County resulting from continued use of an untreated well.

The adoption of the drinking water guidelines in New York State in 1977 generally coincides with the development of analytical techniques to test for chemicals in water at very low concentrations Prior to 1977, there was no testing for VOCs. Without this historical data, we can not characterize potential exposures and associated health effects. According to the information provided by the Nassau County Health Department, in early 1977 three Manhasset-Lakeville Water District wells showed VOC contaminant levels above drinking guidelines in effect at that time. Therefore chemicals may have been present in the drinking water above current drinking water standards before 1977. However, we cannot determine at what level or duration chemicals may have been present. At this time, we have no information which suggests or confirms ill health effects attributable to site-related chemicals and therefore have not alerted area physicians.

The New York State Department of Health (NYSDOH) is developing a registry which will look at potential exposures to VOCs in private and public water supplies. The NYSDOH will consider including those residents near the Lockheed Martin site in this proposed registry.

VIII. QUESTIONS RELATING TO CITIZEN PARTICIPATION:

Question 46:

This site must be remediated in a manner acceptable to the community. There has been substantial community interest in the clean-up. The affected communities are organized, educated and persistent. Their concerns and comments must be taken seriously by the Department. Therefore hold additional public meetings, as each step in the clean-up process.

Response:

Various Citizen Participation activities are conducted by the NYSDEC to ensure two-way communication with the interested/affected public regarding the investigation and remediation of this site. For highlights of community participation for this site, please refer to Section 8 in the ROD. There will be additional public outreach to keep the public informed of the NYSDEC's progress. The NYSDEC could not agree with you more that the community surrounding this site is organized, educated, and persistent. The NYSDEC representatives will continue to meet with the community, answer their questions, and this will hopefully achieve an acceptable level of confidence

in the remedial program for everyone involved.

Question 47:

We suggest that a "community core group" (hereafter referred to as the group) be organized for the Lockheed Martin Site.

Response:

Such a group can be effective and productive. If an advisory group were to form, the NYSDEC will have a relationship with the proposed group.

Question 48:

Can the group be recognized and referenced in the Responsiveness Summary for OU-1?

Response:

Concerns of the community and public officials regarding the RI/FS reports and the PRAP for OU-1 received during the public comment period have been evaluated in this Responsiveness Summary. During the design phase of the remedy for OU-1, there will be additional public outreach to keep the public informed of the progress. Future opportunities for public involvement will be part of OU-2. The formation of such a group will be noted by the NYSDEC.

Question 49:

Can such a group be made part of the Consent Orders for the Lockheed site?

Response:

Please see response to question no.1.

Question 50:

All future documents, fact sheets, and other communication from the Department should emphasize the areas and issues to be covered by each Operable Unit.

Response:

The last two fact sheets prepared in December 1996 and January 1997 provides information about the areas covered by each operable Unit. The Department will continue to provide information about each Operable Unit in all future communications.

IX. MISCELLANEOUS:

Question 51:

At the public meeting held on January 29, 1997, Mr. James Gangale, an employee of Lockheed Martin, stated that manufacturing activities are currently taking place in addition to engineering design and administrative activities. This would contradict your statement that manufacturing activities ceased approximately 1995. Please advise if manufacturing is currently taking place, if any chemicals are used in the process, and if so, how are these chemicals disposed of ?

Response:

Currently, the Lockheed Martin facility houses primarily administration offices and engineering departments for design, development and administration of government contracted projects. Manufacturing operations at this plant ceased in 1995, however, some assembly, integration, prototype development and testing are still being conducted at the facility. Tightly controlled, small amounts of chemicals are still being used at the facility to support these nonadministrative and non engineering activities. Hazardous wastes from the facility are manifested and disposed of off-site through State permitted treatment, storage and disposal facilities.

APPENDIX B
Lockheed Martin Tactical Systems, Inc.
(Formerly Unisys Corporation)
Operable Unit 1
Site No. 130045

ADMINISTRATIVE RECORD

1. Site Assessment for the Unisys Manufacturing Facility Site, prepared by Unisys Corporation, October 1990.

2. Site Assessment Report, Unisys Defense Systems, Inc. Shipboard and Ground Systems Facility, prepared by Unisys Corporation Environmental Affairs Group, Volume 1,2,3,4, and 5, January 1992.

3. Order on Consent Appendix B, Scoping Document, Unisys Defense Systems, Inc. Shipboard and Ground Systems Facility, prepared by Unisys Corporation Environmental Affairs Group, January 1992.

4. IRM Operable Unit 1 Final Groundwater Remediation work Plan, Unisys Corporation, prepared by Unisys Corporation, January 1993.

5. Sampling and Analysis Plan, Unisys Corporation, prepared by Unisys Corporation, July 1993.

6. Final Remedial Investigation and Feasibility Study Work Plan, Unisys Corporation, prepared by Unisys Corporation, September 1993.

7. Interim Remedial Measure- Soil Remediation Work Plan, Unisys Corporation, prepared by Unisys Corporation, November 1993.

8. Phase I Remedial Investigation Report, Lockheed Martin Tactical Defense Systems Division, H2M Group, December 1996.

9. Supplemental Remedial Investigation Report, Lockheed Martin Tactical Defense Systems Division, H2M Group 1996.

10. Feasibility Study Report, Operable Unit 1, Lockheed Martin Tactical Defense Systems Division, H2M Group, January 1997.

11. Baseline Human Health Risk Assessment Report, Operable Unit 1, Lockheed Martin Tactical Defense Systems Division, H2M Group, January 1997.

Table 1
RI Soil Quality Evaluation - Organics
Lockheed Martin
Great Neck, NY

Compound	RI Background Sample	Dry Well Soil Sample Results			Site-Specific Soil Clean-Up Objectives[a]
		Minumum to Maximum Concentration	Number of Samples Above Cleanup Objective	Average Concentration	
	Miligrams per Kilogram				
1,2 - Dichloroethene (total)	ND	ND to 160J	G	16.842	0.835
1,1,1 - Trichloroethane	ND	ND to 65J	G	7.342	2.28
Trichloroethene	ND	ND to 7,800	C, E, G, H, I	834.7	1.89
Benzene	ND	ND to 0.096J	0	0.018	0.174
Tetrachloroethene	ND	0.002J to 18,000	C, D, E, F, G, H, I, J	2436.7	4.155
Toluene	ND	ND to 280B	I	28.84	4.5
Chlorobenzene	ND	ND to 6U	G	6.942	4.95
Ethylbenzene	ND	ND to 440J	G, I	50.422	16.5
Xylene (total)	ND	ND to 3,200	C, E, G, H, I	366.5	3.6
Phenol	ND	ND to 27	I, J	2.98	0.33
1,3 - Dichlorobenzene	ND	ND to 7.3J	I	0.737	4.65
1,4 - Dichlorobenzene	ND	ND to 14J	---	1.814	25.5
1,2 - Dichlorobenzene	ND	ND to 89	I	11.43	23.97
4 - Methylphenol	ND	ND to 87	I	8.99	2.55
2,4 - Dimethylphenol	ND	ND to 54	---	5.697	unknown
1,2,4 - Trichlorobenzene	ND	ND TO 2.1J	---	0.21	10.05
Napthalene	ND	ND to 28J	---	5.318	39
2 - Methylnaphthalene	ND	ND to 9.7J	---	2.116	109.05
Fluorene	ND	ND to 0.34J	---	0.034	1095
Phenanthrene	0.34J	ND to 4.6J	---	1.646	654.75
Anthracene	0.023J	ND to 0.18J	---	0.029	2100
Di-n-butylphthalate	0.018J	ND to 210B	G	21.0	24.3
Fluoranthene	0.42	ND to 1.1J	---	0.189	5700
Pyrene	0.52	ND to 1.5J	---	0.377	1994.25
Benzo(a)anthracene	0.190J	ND to 0.49J	---	0.057	8.28
Chrysene	0.340J	ND to 0.5J	---	0.069	1.2
bis(2-ethylhexy)phthalate	0.053J	ND to 6.0	---	2.245	1305.9
Benzo(b)fluoranthene	0.260J	ND to 0.50J	---	0.059	3.3
Benzo(k)fluoranthene	0.200J	ND to 0.60J	---	0.068	3.3
Indeno(1,2,3-cd)pyrene	0.110J	ND to 0.059J	---	0.006	9.6
Benzo(g,h,i)peryiene	0.020J	ND to 0.049J	---	0.005	24000
Heptachlor	ND	ND to 0.031J	---	0.006	0.36
Aldrin	ND	ND to 0.22J	---	0.027	2.88
Endosulfan II	ND	ND to 0.084	---	0.014	2.4093
4,4' - DDD	ND	ND to 0.091J	---	0.036	23.1
Endosulfan Sulfate	ND	ND to 0.025J	---	0.005	3.0114
4,4' - DDT	140	ND to 0.068J	---	0.009	7.29
alpha - Chlordane	ND	ND to 0.14J	---	0.015	unknown
gamma - Chlordane	ND	ND to 0.022J	---	0.004	unknown
Arochlor - 1242	ND	ND to 3.8J	---	0.443	5.253
Arochlor - 1248	ND	ND to 0.41	---	0.071	5.253
Arochlor - 1254	ND	ND to 3.9	---	0.698	5.253
Arochlor - 1260	ND	ND to 1.8J	---	0.31	5.253

ND Not detected
J Value is estimated - compound detected below the practical quantitation limit.
B Compound detected in either the field blank, trip blank and/or laboratory blank.
A= B15(10-12'), B= B15(18-20'), C= B16(13-15'), D=B16(19-21'), E= B17(16-18'), F= B17(18-20'), G= B18(6-8')
H= B18(22-24'), I= B19(6-8'), J= B19(18-20')
[a]= Developed in accordance with NYSDEC TAGM HWR 94-4046

Table 2
RI Soil Quality Evaluation - Inorganics
Lockheed Martin
Great Neck, NY

Compound	RI Background Sample	Dry Well Soil Sample Results			TAGM 94-4046	
		Minimum to Maximum Concentration	Average Concentration	Samples Above Background, NYSDEC Soil Cleanup Objectives, and Eastern US Background	Eastern US Background	NYS Recomended Soil Clean-Up Objectives
	Miligrams per Kilogram					
Aluminum	21,100	1,270 to 20,600	5247	---	33,000	SB
Arsenic	8.8	0.23 to 6.4	1.9	---	3-12	7.5 or SB
Barium	63.9	6.9 to 491	80	---	15-600	300 or SB
Beryllium	0.77B	ND to 2.6	0.62	G(2.6)	0-1.75	0.16 or SB
Cadmium	ND.	ND to 23.9	4.2	G(23.9)	0.1-1	10
Chromium	23.9	ND to 670J	81	D(55), G(670)	1.5-40	50
Cobalt	7B	1.8 to 98.8	13	G(98.8)	2.5-60	30 or SB
Lead	82.3	2.2J to 9,780J	1041	G(9,780)	200-500	400*
Magnesium	2290	400 to 15,300	2295	G(15,300)	100-5000	SB
Manganese	379	39.1 to 254	117	---	50-5000	SB
Mercury	0.06B	ND to 23.1	2.8	G(23.1), C(0.52), D(1.6), I(2.2)	0.001-0.2	0.1
Nickel	28.5	12.6 to 679	80	G(679)	0.5-25	13 or SB
Selenium	0.83B	ND to 9.4	1.4	G(9.4)	0.1-3.9	2 or SB
Silver	ND	ND to 6.7J	1.2	---	0.01 - 5.0	SB
Vanadium	50.9	ND to 36.8	11	---	1-300	150 or SB
Zinc	55.7	ND to 4,350	52	G(4,350), C(95), D(140), H(95), I(416)	9-50	20 or SB
Cyanide	ND	ND to 11.3	3.6	---	NA	Site-Specific

ND Not detected

J Value is estimated - compound detected below the practical quantitation limit.

B Compound detected in either the field blank, trip blank and/or laboratory blank

SB Site Background

A= B15(10-12'), B= B15(18-20'), C= B16(13-15'), D=B16(19-21'), E= B17(16-18'), F= B17(18-20'), G= B18(6-8')
H= B18(22-24'), I= B19(6-8'), J= B19(18-20')

* TheEPA's Interim Lead Hazard Guidance establishes a residential screening level of 400 ppm.

Table 3

RI Recharge Basin Sediment Evaluation - Inorganics

Lockheed Martin

Great Neck, NY

Compound	RI Background Sample	Recharge Basin Sediment Samples			TAGM 94-4046	
		Minumum to Maximum Concentration	Samples Above Background, NYSDEC Soil Cleanup Objectives, and Eastern US Background	Average Concentration	Eastern US Background	NYS Recomended Soil Clean-Up Objectives
	Milligrams per Kilogram					
Aluminum	21,100	5,140 to 18,500	---	7817.0	33,000	SB
Arsenic	8.8	.76-18.6	L, O	7.7	3-12	7.5 or SB
Barium	63.9	15.5-35.1	---	56.6	15-600	300 or SB
Beryllium	0.77B	ND	---	0.4	0-1.75	0.16 or SB
Cadmium	ND	ND to .65	---	4.3	0.1-1	10
Chromium	23.9	14.1-171	K, L, M, O, P, Q, T	79.6	1.5-40	50
Cobalt	7B	2-15.3	---	7.5	2.5-60	400*
Lead	82.3	12.8-1,470	L, O, Q, T, P, K	677.6	200-500	SB
Magnesium	2290	804-6,510	O	2852.4	100-5000	SB
Manganese	379	38.9-160	---	89.7	50-5000	SB
Mercury	0.06B	ND-3.4	K, L, M, O, P, Q, R, S, T	1.4	0.001-0.2	0.1
Nickel	28.5	ND-119	K, L, M, O, P, Q, S, T	50.2	0.5-25	13 or SB
Selenium	0.83B	ND-6	L	1.4	0.1-3.9	2 or SB
Silver	ND	2.4-626	K, L, M, O, P, Q, R, S, T	246.3	0.01 - 5.0	SB
Vanadium	50.9	17.5-256	---	103.4	1-300	150 or SB
Zinc	55.7	107-1,770	K, L, M, N, O, P, Q, R, S, T	656.6	9-50	20 or SB
Cyanide	ND	ND-29.2	---	8.5	NA	Site-Specific

ND Not detected

J Value is estimated - compound detected below the practical quantitation limit.

B Compound detected in either the field blank, trip blank and/or laboratory blank

SB Site Background

K= EB1, L= EB2, M= EB3, N= EB4, O= CB1, P= CB2, Q= CB3, R= CB4, S= WB1, T= WB2 (see Figure 6-1 in the RI report)

* TheEPA's Interim Lead Hazard Guidance establishes a residential screening level of 400 ppm.

Table 4
RI Recharge Basin Sediment Evaluation - Organics
Lockheed Martin
Great Neck, NY

Compound	RI Background Sample	Recharge Basin Sediment Samples			Site-Specific Soil Clean-Up Objectives[a]
		Minumum to Maximum Concentration	Samples Above Cleanup Objective	Average Concentration	
	Milligrams per Kilogram				
Carbon disulfide	ND	ND to 0.002	---	---	8.1
1,2 - Dichloroethene (total)	ND	ND to 0.003	---	---	0.885
Trichloroethene	ND	ND to 0.010	---	---	1.89
Tetrachloroethene	ND	ND to 0.016	---	---	4.155
Toluene	ND	ND to 0.004	---	---	4.5
Xylene (total)	ND	ND to 0.0015	---	---	3.6
Napthalene	ND	ND to 0.47	---	---	39
2 - Methylnaphthalene	ND	ND to 0.26	---	---	109.05
Acenaphthylene	ND	ND to 0.48	---	---	123
Acenaphthene	ND	ND to 4.9	---	---	276
Dibenzofuran	ND	ND to0.73	---	---	18.45
Fluorene	ND	ND to 4.6	---	---	1095
Phenanthrene	0.34J	0.48 to 12	---	---	654.75
Anthracene	0.023J	0.0.1 to 9.3	---	---	2100
Carbazole	ND	ND to 0.12	---	---	unknown
Di-n-butylphthalate	0.018J	ND to 1.2	---	---	24.3
Fluoranthene	0.42	1 to 60	---	---	5700
Pyrene	0.52	0.13 to 48	---	---	1994.25
Benzo(a)anthracene	0.190J	ND to 31	S	5.28	8.28
Chrysene	0.340J	0.85 to 31	K, L, O, P, Q, R, S, T	7.67	1.2
bis(2-ethylhexy)phthalate	0.053J	ND to 7.3B	---	---	1305.9
Benzo(b)fluoranthene	0.260J	0.074J to 23	K, O, P, Q, S, T	6.14	3.3
Benzo(k)fluoranthene	0.200J	ND to 33	K, O, Q, S, T	7.21	3.3
Benzo(a)pyrene	ND	0.047J to 28	---	---	33
Dibenzo(a,h)anthracene	ND	ND to 0.36J	---	---	4950000
Indeno(1,2,3-cd)pyrene	0.110J	ND to 16J	Q	2.38	9.6
Benzo(g,h,i)perylene	0.020J	ND to 1.2J	---	---	24000
4,4' - DDE	ND	ND to 0.22J	---	---	13.2
4,4' - DDD	ND	ND to 0.92J	---	---	23.1
4,4' - DDT	140	ND to 0.068J	---	---	7.29
alpha - Chlordane	ND	ND to 0.058J	---	---	unknown
gamma - Chlordane	ND	ND to 0.055	---	---	unknown
Arochlor - 1242	ND	ND to 0.12J	---	---	5.253
Arochlor - 1248	ND	ND to 2.4J	---	---	5.253
Arochlor - 1254	ND	ND to 1.5	---	---	5.253
Arochlor - 1260	ND	ND to 0.25J	---	---	5.253

ND Not detected

J Value is estimated - compound detected below the practical quantitation limit.

B Compound detected in either the field blank, trip blank and/or laboratory blank

K= EB1, L= EB2, M= EB3, N= EB4, O= CB1, P= CB2, Q= CB3, R= CB4, S= WB1, T= WB2 (see Figure 5-1 in the RI report)

(a)= Developed in accordance with NYSDEC TAGM HWR 94-4046.

Table 5
RI Groundwater Quality Evaluation
Lockheed Martin
Great Neck, NY

Compound	Minumum to Maximum Concentration	Number of Samples Above Background (54 total)	NYS MCLs
	Micrograms/Liter		
1,1 Dichloroethene	ND to 2J	0	5
1,2 - Dichloroethene (total)	2 to 11,000	54	5
1,1,1 - Trichloroethane	ND to 120	1 (25GL)	5
Trichloroethene	ND to 320	51	5
Tetrachloroethene	ND to 350	52	5
Freon 113	ND to 77	5	5
Phenol	ND to 2,100	1 (15ML)	50
Diethylphthalate	ND to 1J	0	50
Di-n-butylphthalate	ND to 0.6J	0	50
Butylbenzylphthalate	ND to 0.7J	0	50
Heptachlor	ND to 0.034J	0	0.4

ND Not detected
J Value is estimated - compound detected below the practical quantitation limit.
B Compound detected in either the field blank, trip blank and/or laboratory blank