FINAL PHASE II ENVIRONMENTAL SITE ASSESSMENT for the SALVAGE AREA, PERMITTED DRUM STORAGE FACILITY, AND INDUSTRIAL WASTE TREATMENT PLANT

GOCO FACILITY

BETHPAGE, NEW YORK

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TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY iii

1.0 INTRODUCTION 1-1
- 1.1 Facility Description 1-1
- 1.2 Purpose of the Phase II Assessment 1-3
- 1.3 Evaluation of Sample Results 1-3
- 1.4 Document Organization 1-3

2.0 OVERVIEW OF PHASE I ESA 2-1
- 2.1 Data Gathered for the Phase I ESA 2-1
- 2.2 Site Setting 2-1
- 2.3 Potential Off-site Sources of Contamination 2-2
- 2.4 Previous Investigations at the Site 2-2
- 2.5 AOC Descriptions and Recommendations 2-3
  - 2.5.1 AOC 1 - UST 03-07-01 (old) 2-3
  - 2.5.2 AOC 2 - UST 03-28-01 2-5

3.0 FIELD PROGRAM 3-1
- 3.1 Health and Safety Procedures 3-1
- 3.2 Sampling Methodology 3-1
- 3.3 Sample Locations and Depths 3-2
  - 3.3.1 AOC 1 - UST 03-07-01 (old) 3-2
    - 3.3.1.1 Initial Sampling Event 3-2
    - 3.3.1.2 Secondary Sampling Event 3-4
  - 3.3.2 AOC 2 - UST 03-28-01 3-4
- 3.4 Sample Collection Procedures 3-4
- 3.5 Field Screening of Soil Samples 3-5
- 3.6 Field Observations 3-6

4.0 ANALYTICAL PROGRAM 4-1
- 4.1 Laboratory Protocols 4-1
- 4.2 Quality Assurance and Quality Control 4-2
- 4.3 Data Validation 4-2
- 4.4 Data Usability 4-3

5.0 PHASE II FINDINGS 5-1
- 5.1 AOC 1 5-1
  - 5.1.1 Initial Sampling Event 5-1

TABLE OF CONTENTS (Continued)

5.1.2 Secondary Sampling Event 5-2
5.2 AOC 2 5-2

6.0 CONCLUSIONS AND RECOMMENDATIONS 6-1

Appendix A - ANALYTICAL DATA TABLES
Appendix A.1 - INITIAL SAMPLING EVENT
Appendix A.2 - SECONDARY SAMPLING EVENT

Appendix B - BOREHOLE LOGS

Appendix C - CHAIN OF CUSTODY FORMS

Appendix D - DATA VALIDATION REPORTS
Appendix D.1 - INITIAL SAMPLING EVENT
Appendix D.2 - SECONDARY SAMPLING EVENT

EXECUTIVE SUMMARY

Radian International LLC (Radian) has been retained by Northrop Grumman Corporation (Northrop Grumman) to perform Phase II Environmental Site Assessments (ESAs) for several government-owned, contractor-operated (GOCO) areas at the Bethpage, New York facility. In March of 1997, field activities were commenced for the Phase II ESA of the Salvage Area, Permitted Drum Storage Facility, and Industrial Waste Treatment Plant (Salvage and Treatment Area) at the Bethpage facility. Field activities at the site were conducted during two separate sampling events lasting one day each. The first sampling event was conducted on March 25, 1997. The second sampling event was conducted on May 27, 1997.

Project Objectives

The main objective of this Phase II ESA is to document the investigatory activities undertaken in accordance with the recommendations of the Phase I Site Assessment for the Salvage and Treatment Area.

Facility Description

The Salvage and Treatment Area is situated within the Government Owned, Contractor Operated (GOCO) section of the Northrop Grumman facility. The site is located in the north-central portion of the Northrop Grumman facility in the Town of Oyster Bay, Bethpage, New York. The Salvage and Treatment Area has been used for salvage operations, permitted drum storage and treatment of industrial wastewater at the IWTP.

Summary of Findings

In 1996 and 1997, Radian completed a Phase I ESA for the Salvage and Treatment Area. The Phase I ESA identified two AOCs at the Salvage and Treatment Area, and recommended

completion of three soil borings and collection of six soil samples. Both AOCs were selected based on the possible existence of underground storage tanks (USTs) that had been previously operated at two locations. Records describing closure procedures were not available for either of these USTs.

Initial Sampling Event

During initial Phase II field activities, three soil borings were completed and five samples were collected from each boring. Field screening of samples from each boring was conducted with a photo ionization device (PID). Based on the results of the field screening, two samples were selected for laboratory analysis from each boring. Each selected sample was analyzed for volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH) with fingerprinting and polychlorinated biphenyls (PCBs). Laboratory analyses were performed by Nytest Environmental, Inc. of Port Washington, New York and RECRA Environmental, Inc. of Amherst, New York. Both of these labs carry the 1995 Analytical Services Protocol (ASP) certification as required by Northrop Grumman for this project. Radian subcontracted with EcoChem, Inc. of Seattle, Washington to perform validation of the analytical data generated during this Phase II ESA.

Results indicated that soil from one of the borings completed at AOC 1 (Boring ST-02A) contained TPH (fingerprinted as 10W40 motor oil) at a concentration of 430 mg/kg in the interval from 10 to 12 feet below ground surface (bgs) and at a concentration of 160 mg/kg in the interval from 18 to 20 feet bgs. The only VOC detected above method quantitation limits was tetrachloroethene at a concentration of 18 μg/kg, also in Boring ST-02A. PCBs were not detected in any of the soil samples collected.

According to NYSDEC guidance, the soil clean up objective for tetrachloroethene is 1,400 μ μg/kg. There is no NYSDEC guidance for TPH concentrations in soil.

Secondary Sampling Event

Based on the presence of fingerprinted TPH in soil samples from Boring ST-02A, Radian performed confirmation sampling directly adjacent to Boring ST-02A following the protocols established in STARS, and collected seven soil samples from the new boring (Boring ST-01C). Samples were collected continuously from a depth of 10 feet bgs to 24 feet bgs. Samples were analyzed for constituents contained in Table 2 (fuel oil contaminated soil) of NYSDEC's Spill Technology And Remediation Series (STARS) Memo No. 1, Petroleum-Contaminated Soil Policy. None of the constituents from Table 2 of the STARS Memo No. 1 were detected in the confirmation samples.

Based on these results, it is recommended that no further investigation or remediation be conducted at the Salvage and Treatment Area.

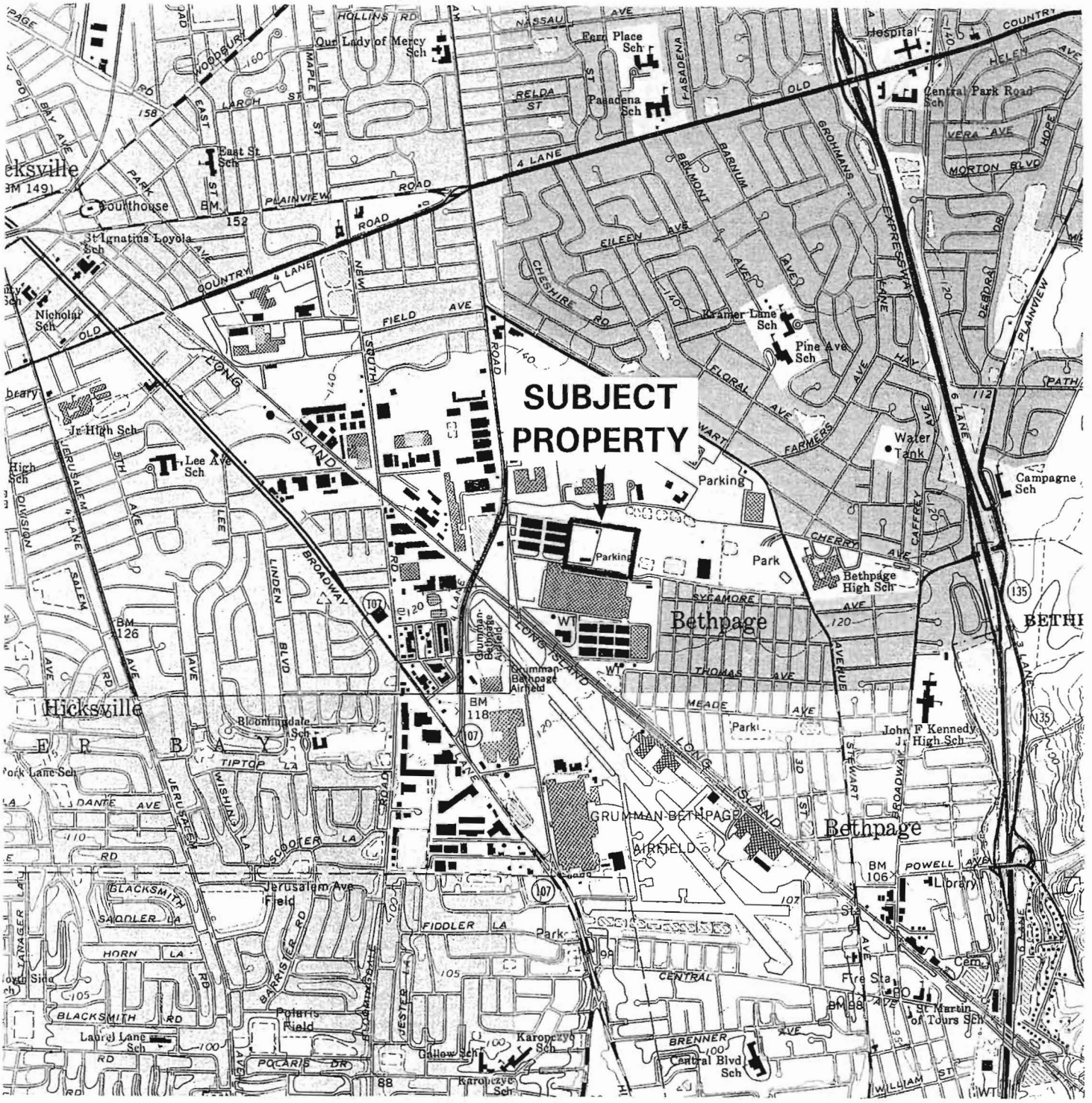
1.0 INTRODUCTION

The purpose of this Phase II Environmental Site Assessment (ESA) is to document the investigatory activities undertaken in accordance with the recommendations of the Phase I Site Assessment for the Salvage Area, Permitted Drum Storage Facility, and Industrial Waste Treatment Plant (Salvage and Treatment Area). The assessment included collection of soil samples, field screening of organic vapors in the headspace of sample containers, and laboratory analysis of soil samples.

1.1 Facility Description

The Salvage and Treatment Area is part of a larger facility know as the Naval Weapons Industrial Reserve Plant (NWIRP). The NWIRP property is owned by the U.S. Navy and operated by Northrop Grumman Corporation (Northrop Grumman). The NWIRP facility is also referred to as the Government Owned, Contractor Operated (GOCO) facility. The Salvage and Treatment Area is located in the north-central portion of the Northrop Grumman facility in the Town of Oyster Bay, Bethpage, in Nassau County, New York. The Salvage and Treatment Area has been primarily used for salvage operations, drum storage, and wastewater treatment operations in support of aircraft manufacturing. The salvage operation includes metals recycling and storage of aircraft and aircraft parts. A Resource Conservation and Recovery Act (RCRA) and New York Compilation of Rules and Regulations (NYCRR), Title 6, Chapter 373 permitted drum storage facility is operated at the site. The Industrial Waste Treatment Plant (IWTP) treats industrial wastewater generated from Plant 3. Figure 1 shows the vicinity map for the Salvage and Treatment Area.

The Salvage and Treatment Area has been investigated previously by the U.S. Navy, and was designated as Site 9 during a 1986 Initial Assessment Study that included the NWIRP facilities in Bethpage and Calverton, New York. When investigations at the Bethpage and Calverton



RADIAN INTERNATIONAL LLC

VICINITY MAP
SALVAGE AND TREATMENT AREA

Figure: 1

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facilities were separated, the site designation was changed to Site 3. For the purposes of this report, the site will be referred to as the Salvage and Treatment Area.

1.2 Purpose of the Phase II Assessment

The purpose of the Phase II ESA is to document the investigatory activities undertaken in accordance with the recommendations of the Phase I Site Assessment for the Salvage and Treatment Area. Samples collected at each AOC have been analyzed for contaminants that could be expected based on the findings of the Phase I ESA. The analytical results are then compared to applicable guidelines to determine if further investigative or remedial action is necessary.

1.3 Evaluation of Sample Results

Constituent concentrations in collected soil samples were compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Clean Up Levels (TAGM 4046). Because TAGM 4046 does not include guidance for total petroleum hydrocarbons (TPH), any samples that contained fingerprinted TPH above analytical detection limits were collected again and analyzed for constituents included in the Spill Technology And Remediation Series (STARS) Memo No. 1, Petroleum-Contaminated Soil Policy. If any of the guidance values from the STARS Memo No. 1 for TCLP or total concentrations were exceeded at a particular location, additional investigative or remedial action would be recommended.

1.4 Document Organization

Section 1 of this document contains an introduction to the Phase II ESA for the Salvage and Treatment Area and briefly describes the site. Section 2 provides a summary of the Phase I ESA for the Salvage and Treatment Area. Section 3 describes the field program that was implemented to gather the necessary data for development of conclusions and recommendations. Section 4

describes the laboratory analytical program, including Quality Assurance/Quality Control (QA/QC) procedures and protocols, and data validation methods. Section 5 lists and discusses all analytical results. Section 6 provides the conclusions and recommendations for the Salvage and Treatment Area.

Appendix A to this report contains the complete analytical data tables. Appendix B contains the borehole logs for each boring completed at the Salvage and Treatment Area. Appendix C contains the chain of custody forms for all samples that were sent to the laboratory for analysis. Appendix D contains the validation reports for all data generated by the analytical laboratories.

2.0 OVERVIEW OF PHASE I ESA

In March of 1997, a Phase I ESA was completed for the Salvage and Treatment Area. The following sections briefly describe the findings of the Phase I ESA.

2.1 Data Gathered for the Phase I ESA

Information gathered during the Phase I ESA included:

- A search of standard regulatory agency databases;
- Inspection of state, county and local environmental records;
- Visual inspections of the property and surrounding properties;
- Review of historical aerial photographs;
- Interviews with Northrop Grumman personnel; and,
- Review of Northrop Grumman records and files.

This information was combined to help select AOCs for the Salvage and Treatment Area, and to recommend appropriate analysis of environmental samples to be collected as part of the Phase II ESA.

2.2 Site Setting

The Salvage and Treatment Area occupies approximately 16 acres within the 105-acre GOCO section of the Northrop Grumman facility. The site is surrounded by industrial and commercial property. The area north of the Salvage and Treatment Area includes Plant 14. East of the site are the three GOCO Plant 3 recharge basins. Plant 3 is directly south of the site, and the Plant 17 North warehouses are located west of the site.

The site is owned by the U.S. Navy and has been operated by Northrop Grumman since approximately 1945. The site has been used for salvage operations, permitted drum storage, and treatment of industrial wastewater. Operations at the site have included handling and storage of

chemicals and storage of petroleum products in above and below ground tanks. These operations are currently ongoing at the site.

2.3 Potential Off-site Sources of Contamination

Database searches and review of regulatory records indicated that the only off-site source with significant potential to contaminate the Salvage and Treatment Area is the Occidental Chemical Company (OCC) RUCO Polymer National Priorities List (NPL) site. This NPL site is located west of the Salvage and Treatment Area and is currently under investigation.

Because Northrop Grumman, OCC and the U.S. Navy are currently developing a Feasibility Study to develop, evaluate, and select potential remedial alternatives that can be implemented to address contaminated groundwater in the vicinity of the Northrop Grumman Bethpage facility, groundwater was not identified as an area of concern during the Phase I ESA.

2.4 Previous Investigations at the Site

Soil and groundwater have been investigated by the U.S. Navy at the Salvage and Treatment Area since 1986. An Initial Site Assessment was completed in 1986 for the Northrop Grumman Bethpage and Calverton, New York facilities. The Salvage and Treatment Area was designated as Site 9 and was recommended for further investigation. Phase I and Phase II remedial investigations were completed at the Salvage and Treatment Area in 1992 and 1993. Soil, soil gas and groundwater were sampled as part of these investigations. Results of these investigations indicated low levels of volatile organic compound contamination in the soil and groundwater at the site.

In the early 1990's, several investigations were conducted at the OCC/RUCO NPL site and in various portions of the NWIRP facility (including the GOCO facility). None of these investigations included sampling at the Salvage and Treatment Area.

In May 1995, The U.S. Navy and NYSDEC entered into a Record of Decision (ROD) for three sites at the Northrop Grumman Bethpage facility, including the Salvage and Treatment Area. Based on results of previous investigations, it was determined that no further remedial action would be required at the Salvage and Treatment Area.

2.5 AOC Descriptions and Recommendations

Based on the information collected during the Phase I ESA, two AOCs were identified at the Salvage and Treatment Area. Brief descriptions and Phase I recommendations for each AOC are included in the following sections. Table 2-1 summarizes the recommendations for both AOCs.

2.5.1 AOC 1 - UST 03-07-01 (old)

The estimated location of UST 03-07-01 (old) was designated as an AOC because no records of closure for this tank were available at the time the Phase I ESA was conducted. The designation "(old)" is included with the tank ID number because a new UST numbered 03-07-01 has since been installed at the current salvage operations building. The "old" tank had a capacity of 2,000 gallons, was constructed from single-walled steel with an asphaltic coating, and was used to store No. 2 fuel oil for use at the former location of the salvage building. Records indicated that the tank was installed in 1943, but information regarding the date or method of closure for this tank was not available.

The Phase I ESA recommended that two soil borings be completed at this AOC, and that soil samples collected from each boring be analyzed for volatile organic compounds (VOCs), fingerprinted TPH and polychlorinated biphenyls (PCBs).

Table 2-1

Summary of Recommendations for Phase II Site Assessment

AOC No.	AOC Description	No. of Borings [2]	No. of Corings	Lineal Ft Drilling	No. of Soil Samples	Sampling Interval	No. of Water Samples	Principal Chemicals of Concern - Target Compounds	Recommended Analyses [1] (soil/concrete)						
									1	2	3	4	5	6	7
1	UST 03-07-01 (old) (2,000 gallons)	2	N/A	20	4	0-10 ft[3,4,5] (continuous)	N/A	Fuel Oil		4/0			4/0	4/0	
2	UST 03-28-01 (550 gallons)	1	N/A	20	2	0-10 ft[3,4,5] (continuous)	N/A	Diesel Fuel		2/0			2/0	2/0	

N/A - Not Applicable

(1) Analyses are listed below.

(2) USTs less than 1,000 gallons will require 1 boring. USTs greater than or equal to 1,000 gallons will require 2 borings.

(3) For continuous soil sampling, a sample will be collected every two (2) feet.

(4) Samples from borings at the USTs will be collected below the BOTTOM OF THE TANK.

(5) First sample to be collected directly below the tank. Remaining samples to be screened by PID and highest reading sample analyzed.

1 - Priority Pollutant Metals (Method 6010)
2 - Volatile Organic Compounds (Method 8240)
3 - Semivolatile Organic Compounds (Method 8270)
4 - Cyanide (Method 335.1)
5 - Total Petroleum Hydrocarbons (Method 8015- Modified)
6 - Polychlorinated biphenyls (PCBs)
7 - Select Glycols (no method number)

2.5.2 AOC 2 - UST 03-28-01

The estimated location of UST 03-28-01 was designated as an AOC because no records of closure were available for this tank at the time the Phase I ESA was conducted. This tank had a capacity of 550 gallons, was constructed from single-walled steel with an asphaltic coating, and was used to store diesel fuel for use at the outdoor portion of the IWTP. Records indicated that the tank was installed in 1975, but information regarding the date or method of closure for this tank were not available.

The Phase I ESA recommended that one soil boring be completed at this AOC, and that soil samples collected from the boring be analyzed for VOCs, fingerprinted TPH, and PCBs.

3.0 FIELD PROGRAM

Initial sampling at the Salvage and Treatment Area was begun on March 25, 1997 and was completed on the same day. A second round of sampling was conducted on May 27, 1997. The following sections describe in detail the field sampling program conducted for the Phase II ESA at the Salvage and Treatment Area.

3.1 Health and Safety Procedures

A site-specific health and safety plan was developed by Radian for all field activities performed at the Salvage and Treatment Area. Field personnel were required to review the plan and follow all provisions of the plan.

In addition to the requirements prescribed in the health and safety plan, Northrop Grumman required that Radian field sampling personnel wear safety glasses at all times during sampling. Northrop Grumman also required that gasoline-powered sampling equipment not be used for any indoor sampling. Diesel-powered equipment was considered acceptable for indoor sampling, as long as equipment exhaust was directed outside the building. Propane-powered sampling equipment was permitted inside of all Northrop Grumman buildings. Outdoor sampling only was performed at the Salvage and Treatment Area.

3.2 Sampling Methodology

As discussed previously, the purpose of the Phase II ESA at the Salvage and Treatment Area is to document the investigatory activities undertaken in accordance with the recommendations of the Phase I ESA. To achieve this purpose, initial sampling was conducted at each previously selected AOC where sampling was recommended. Results from collected samples were reviewed to determine whether additional sampling or remediation would be necessary at each AOC.

Initial sampling results were reviewed to determine if a second round of sampling would be required. The purpose of secondary sampling is to effectively delineate contamination, or to determine whether remediation is required. If initial soil samples indicated that contaminants, other than fingerprinted TPH, were present, secondary delineation was performed. When feasible, delineation sampling consisted of collecting soil samples from four borings, each located five feet from the original boring. Sampling depths were selected based on the depth that the contaminant(s) were detected in the original boring. If fingerprinted TPH was detected in soil samples, a confirmatory boring was advanced adjacent to the original boring, and soil samples analyzed for compounds contained in NYSDEC's STARS Memo No. 1.

If secondary sampling did not fully delineate the vertical or horizontal extent of contamination at a particular AOC, tertiary sampling was conducted. The purpose of tertiary sampling is to effectively delineate any contamination such that effective remediation can be performed.

For the Salvage and Treatment Area, initial sampling results indicated that secondary sampling was required at AOC 1. These sampling events are discussed below in Section 3.3. Results from the sampling events are discussed in Section 5 of this report.

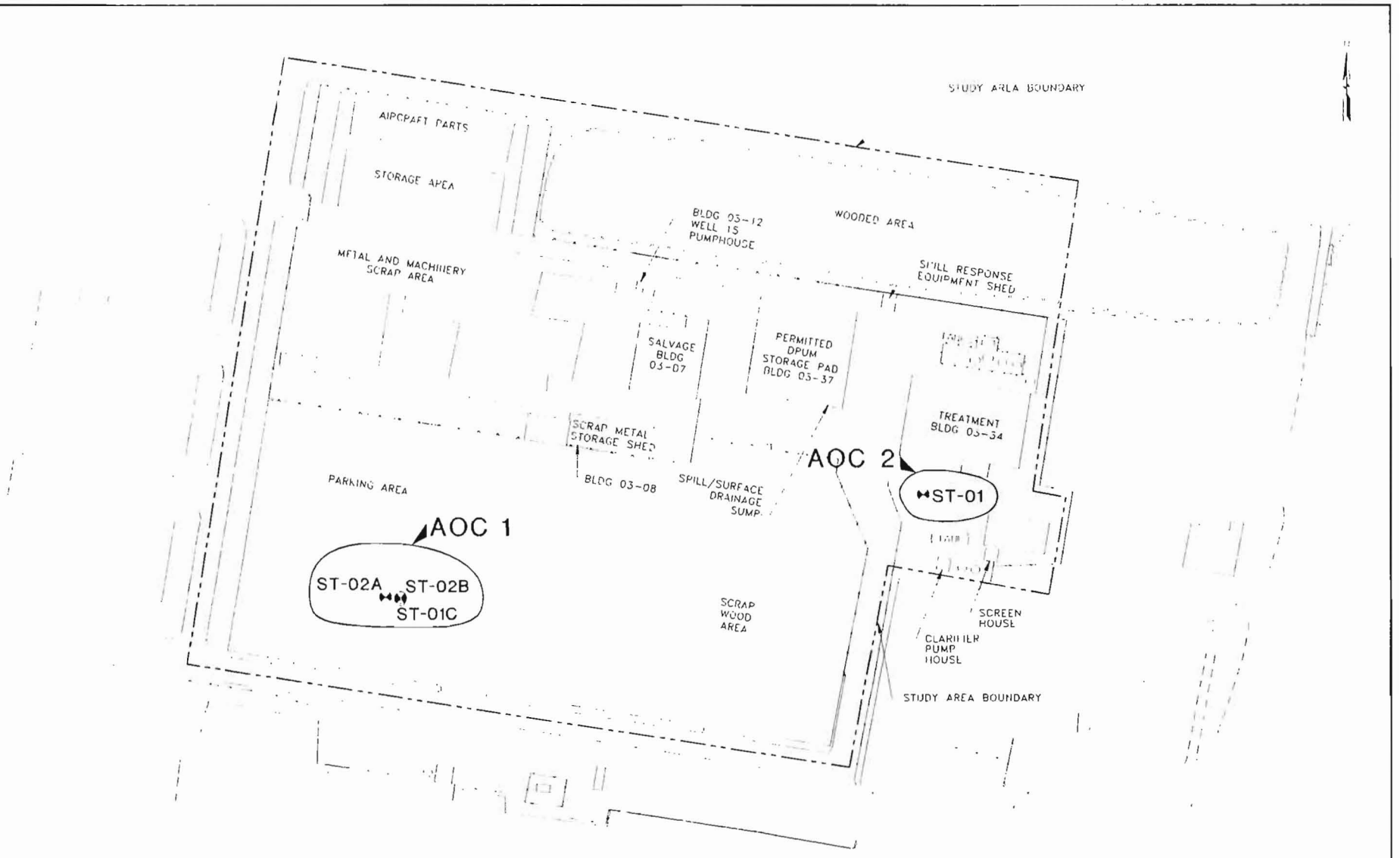
3.3 Sample Locations and Depths

Figure 2 shows the locations of the four soil borings completed for the Salvage and Treatment Area. These locations were surveyed and are shown in relation to permanent structures at the site.

3.3.1 AOC 1 - UST 03-07-01 (old)

3.3.1.1 Initial Sampling Event

Initial sampling at AOC 1 included installation of two soil borings (Borings ST-02A and ST-02B). Each of the borings was completed through the existing asphalt surface in the area.



LEGEND

SOIL BORING LOCATION

CLIENT:
NORTHROP GRUMMAN CORP.
BETHPAGE, LONG ISLAND, NY

RADIAN INTERNATIONAL LLC

DWG. TITLE:
SOIL BORING LOCATIONS
SALVAGE AND TREATMENT AREA

DRAWN BY:	DATE:	FIGURE:
RTD	JULY 1997	2
PROJECT No.: 2704 4003	SCALE:	FILE NUMBER GRUMMAN2.DWG

Since it was assumed that the bottom of tank 03-07-01 (old) was located approximately 10 feet below ground surface (bgs), samples were collected starting at 10 feet bgs. Five soil samples were collected continuously from 10 to 20 feet bgs in each borehole. Each sample represented a two-foot interval.

3.3.1.2 Secondary Sampling Event

Secondary sampling at AOC 1 included installation of one soil boring. This boring was completed through the existing asphalt surface in the area. The sample location was selected based on the location of a previous borehole that had indicated potential subsurface contamination. Samples were collected starting at 10 feet bgs. Seven soil samples were collected continuously from 10 to 24 feet bgs in each borehole. Each sample represented a two-foot interval.

3.3.2 AOC 2 - UST 03-28-01

Sampling at AOC 2 included installation of one soil boring (Boring ST-01). There was no pavement or other surface obstructions encountered at the sampling point. It was assumed that the bottom of tank 03-28-01 was located approximately 10 feet bgs, therefore samples were collected starting at 10 feet bgs. Five soil samples were collected continuously from 10 to 20 feet bgs in the borehole. Each sample represented a two-foot interval.

3.4 Sample Collection Procedures

Radian subcontracted to Zebra Environmental (Zebra) of Inwood, New York for collection of soil samples at the Salvage and Treatment Area. Zebra personnel operated direct push sampling rigs to collect soil samples, while Radian field personnel handled samples after collection and transferred the samples to proper shipping containers for transport to the laboratory. Samples

were collected using hollow steel sampling tubes which were lined with plastic soil collection sleeves. The steel tubes were decontaminated between samples using a pressure washer and a soap and water solution. The plastic sleeves were not reused.

Samples were transferred directly from the plastic sleeves to the appropriate sample containers. Sample containers for VOC analysis were transferred immediately after sample collection to minimize the opportunity for loss of VOCs during sample handling. Disposable latex or nitrile gloves were worn by the Radian sampling personnel during transfer of the soil to the containers. Gloves were discarded between samples.

3.5 Field Screening of Soil Samples

Each soil sample collected at the Salvage and Treatment Area was screened for organic vapors using a photo ionization device (PID). Organic vapor concentrations were determined by sampling the headspace within the sample container for each soil sample.

Prior to commencement of sampling activities, it was decided that at least two samples from boreholes located at UST sites (all three boreholes at the Salvage and Treatment Area are at UST sites) would be sent to the laboratory for analysis. It was also decided that, if applicable, the two samples with the highest readings in each borehole would be selected for analysis. If organic vapors were not detected in any of the samples, or all vapor concentrations were equal, the deepest and most shallow samples would be sent to the laboratory. In addition, Radian field sampling personnel were given the authority to collect additional deeper samples or send additional samples to the laboratory, if field observations warranted.

Periodic sampling of the air in the breathing zone and at the ground surface indicated a background organic vapor concentration of 1 part per million (ppm) at the Salvage and Treatment Area. The following table lists the field screening results for the samples collected at the Salvage and Treatment Area.

AOC	Boring Number	Sample ID	Sample Depth (feet bgs)	Organic Vapor Conc. (1)	Sent to Laboratory?
1	1	ST-02A-1	10-12	1	Yes
1	1	ST-02A-2	12-14	1	No
1	1	ST-02A-3	14-16	0	No
1	1	ST-02A-4	16-18	0	No
1	1	ST-02A-5	18-20	1	Yes
1	2	ST-02B-1	10-12	0	Yes
1	2	ST-02B-2	12-14	0	No
1	2	ST-02B-3	14-16	0	No
1	2	ST-02B-4	16-18	0	No
1	2	ST-02B-5	18-20	1	Yes
2	1	ST-01A-1	10-12	0	Yes
2	1	ST-01A-2	12-14	0	No
2	1	ST-01A-3	14-16	0	No
2	1	ST-01A-4	16-18	0	No
2	1	ST-01A-5	18-20	0	Yes

(1) Organic vapor concentrations are in ppm, and are reported as ppm above background concentration.

3.6 Field Observations

The weather during initial field activities at the Salvage and Treatment Area was overcast and breezy, and outdoor temperatures were between 35 and 45 degrees Fahrenheit. The weather during secondary field activities at the Salvage and Treatment Area was sunny with temperatures between 75 and 85 degrees Fahrenheit. Prior to initial sampling, a tank and cable detector was employed at each AOC in an effort to locate the UST that had been previously operated at the site. Because of magnetic interference, the presence of underground tanks was not confirmed prior to sampling. No underground tanks or other structures were encountered during sampling.

Because use of direct-push equipment prohibits observation of subsurface soil except when samples are collected, complete borehole logs could not be developed for the Salvage and

Treatment Area. The soil in this area is generally yellow to brown in color and is mostly sand with some silt and gravel present. Borehole logs describing samples collected at the Salvage and Treatment Area are provided in Appendix B to this report.

None of the soil samples collected at the Salvage and Treatment area had any observable signs of contamination. Observable signs of soil contamination include odor and visible staining.

4.0 ANALYTICAL PROGRAM

This section presents the various elements of the sample analysis program used by Radian for samples collected as part of the Phase II ESA. For the Salvage and Treatment Area, only soil samples were collected. All samples were analyzed for VOCs, TPH and PCBs.

4.1 Laboratory Protocols

The samples collected during the Phase II investigation were analyzed in accordance with the NYSDEC Analytical Services Protocol (ASP), dated December 1991. The laboratories performing the analyses for this project were Nytest Environmental, Inc. of Port Washington, New York and RECRA Environmental, Inc. of Amherst, New York. Each of these laboratory facilities served as a subcontractor to Radian. The samples from the Salvage and Treatment Area were analyzed for Target Compound List (TCL) VOCs, TPH as Gasoline and Diesel Range Organics (GRO and DRO), and TCL PCBs. NYSDEC ASP analytical methods were used for these analyses and are listed on Table 4-1.

Table 4-1. Analytical Methods

Parameter	Method
TPH - Gasoline Range Organics	SW-846 8015-modified
TPH - Diesel Range Organics	SW-846 8015-modified
TCL Volatile Organics	ASP 91-1
TCL Polychlorinated Biphenyls	SW-846 8080

4.2 Quality Assurance and Quality Control

The laboratory performed the following quality assurance and quality control (QA/QC) procedures according to the NYSDEC ASP:

- Initial and continuing instrument calibration;
- Instrument tuning (GC/MS);
- Internal standards;
- Laboratory Control Samples;
- Surrogate compounds;
- Laboratory duplicates;
- Matrix spikes and matrix spike duplicates; and
- Method (reagent) blanks.

To assess the overall precision of Radian's sampling and analysis program, field duplicates were collected at a frequency of 5 percent and were submitted to the laboratory for analysis.

4.3 Data Validation

The laboratory data from the initial sampling event was validated by EcoChem, Inc. of Seattle, Washington, a subcontractor to Radian. Data from the secondary sampling event was validated by Radian. A review of sample custody, laboratory performance, and basic quality control parameters was conducted on 100 percent of the samples from one sample delivery group (SDG). This review included evaluation of the following elements:

- Accuracy from matrix spikes and matrix spike duplicates (MS/MSD), blank spikes and surrogates;
- Precision from MS/MSD, laboratory duplicate samples, and field duplicate samples;
- Calibration, both initial and continuing;
- Instrument performance checks (for TCL volatiles only); and
- Method and instrument blank contamination.

Additionally, 20 percent of the samples from the SDG received a full review including review of documentation, completeness, and transcription and calculation checks.

The data validation was based on the quality control (QC) criteria documented in the NYSDEC ASP, the individual methods, the laboratory-specific procedures, the National Functional Guidelines for Organic Data Review (1994) and the EPA Region II Functional Guidelines (1992). The validation report for the Salvage and Treatment Area is provided in Appendix D to this report.

Data qualifiers were assigned according to the EPA Region II of National Functional Guidelines to data that were impacted. These qualifiers are summarized in the data validation reports. Overall, the data collected for the Salvage and Treatment Area, as qualified, are acceptable for use.

4.4 Data Usability

For the primary sampling event, 627 analytical results were generated. From the validation process, 16 (2.59%) results were qualified with a "J" as being estimated; while 5 (0.8%) results were qualified with an "R" as being rejected. The rejected results include:

- Data points for the tentatively identified compound (TIC) unknown siloxane were rejected in five data points in the four samples: ST011, ST015, ST02B1, and ST02B5. The basis for the rejection of these data points was that siloxanes are common laboratory contaminants. Because this compound was reported as a TIC, it is expected that the identity of the compound is uncertain and the concentration to be qualitative and are used by the project team only in conjunction with non-TIC data during the decision-making stages of the project. The rejection of these five data points has no effect on the overall usability of this data set.

For the secondary sampling event, 368 analytical results were generated. From the validation process, 1 (0.3%) results was qualified with a "J" as being estimated. None of the results were qualified with an "R" as being rejected.

Overall, with the exceptions noted above, the data generated for these sampling efforts can be used for their intended purposes.

5.0 PHASE II FINDINGS

The following sections discuss the findings of the Phase II ESA at the Salvage and Treatment Area. Sample results are presented and compared to pertinent guidance values.

5.1 AOC 1 - UST 03-07-01 (old)

5.1.1 Initial Sampling Event

During the initial sampling event, two borings were installed at AOC 1 (Borings ST-02A and ST-02B). Soil samples were collected continuously (over two-foot intervals) in each boring starting at 10 feet bgs and continuing to 20 bgs. Five soil samples were collected from each boring and all samples were analyzed for organic vapor concentration in the sample headspace. Organic vapor analysis was performed using a PID. Based on the results of headspace analysis, two samples from each boring were sent to the laboratory for analysis. Samples collected from each boring at 10 to 12 feet bgs and 18 to 20 feet bgs were selected for analysis. Collected samples were analyzed for VOCs, PCBs, and fingerprinted TPH. Table 5-1 lists the compounds detected in samples collected at the Salvage and Treatment Area, and Appendix A contains data for all samples analyzed.

Methylene chloride was detected in all four samples at estimated concentrations that were below the analytical detection limit. Trichloroethene was detected in one sample, however its estimated concentration that was also below the analytical detection limit. Tetrachloroethene was detected in one sample at 18 μg/mg. According to NYSDEC guidance (TAGM 4046), the action level for trichloroethene is 0.7 mg/kg (700 μg/kg), and tetrachloroethene is 1.4 mg/kg (1,400 μg/kg). All detected concentrations of VOCs at AOC 1 were below NYSDEC guidance values for soil.

Diesel Range TPH (fingerprinted as 10W40) oil) was detected in both samples from Boring ST-02A. The TPH concentration was 430 mg/kg in the sample collected from 10 to 12 feet bgs, and

160 mg/kg in the sample collected from 18 to 20 feet bgs. No odors or soil staining was observed in any of the soil samples collected from AOC 2.

No other contaminant concentrations in soil samples collected during the initial sampling event at AOC 1 exceeded NYSDEC guidance values for soil. Based on the findings of the initial sampling event, secondary sampling was recommended at AOC 1.

5.1.2 Secondary Sampling Event

During the secondary sampling event, one boring was installed at AOC 1 (Boring ST-01C). Soil samples were collected continuously (over two-foot intervals) from the boring starting at 10 feet bgs and continuing to 24 bgs. Analysis of the vapors in the sample headspace was not performed. Seven soil samples were collected from the boring and all collected samples were analyzed for constituents contained in STARS Memo No. 1, Table 2. None of the compounds listed in Table 2 were detected above STARS guidance values in any of the seven soil samples.

5.2 AOC 2 - UST 03-28-01

One boring was installed at AOC 2 (Boring ST-01). Soil samples were collected continuously (over two-foot intervals) starting at 10 feet bgs and continuing to 20 bgs. Five soil samples were collected from the boring and all samples were analyzed for organic vapor concentration in the sample headspace. Organic vapor analysis was performed using a PID. Based on the results of headspace analysis, two samples were sent to the laboratory for analysis. Samples collected at 10 to 12 feet bgs and 18 to 20 feet bgs were selected for analysis. Collected samples were analyzed for VOCs, fingerprinted TPH, and PCBs. Table 5-1 lists the compounds detected in samples collected at the Salvage and Treatment Area, and Appendix A contains data for all samples analyzed.

Methylene chloride was detected in both samples at estimated concentrations that were below the analytical detection limit. No other compounds were detected in soil samples collected at AOC 2. No contaminant concentrations in soil samples collected at AOC 2 exceeded NYSDEC guidance values for soil.

Table 5-1

Constituents Detected in Soil Samples Collected at the Salvage and Treatment Area[1]

Sampling Round	Sample ID	AOC	Sample Depth	Constituent	Conc. (µg/kg)	NYSDEC TAGM (µg/kg)	NYSDEC STARS (µg/kg)
3/25/97	ST-01-1	2	10-12	Methylene Chloride	3	100	NA
3/25/97	ST-01-1A	2	10-12	Methylene Chloride	2	100	NA
3/25/97	ST-02A-1	1	10-12	Methylene Chloride	3	100	NA
				Trichloroethene	3	700	NA
				Tetrachloroethene	18	1400	NA
				TPH (as 10W40 Oil)	430 mg/kg	NA	NA
3/25/97	ST-02A-5	1	18-20	Methylene Chloride	3	100	NA
	ST-02A-5			TPH (as 10W40 Oil)	160 mg/kg	NA	NA
3/25/97	ST-02B-1	1	10-12	Methylene Chloride	3	100	NA
3/25/97	ST-02B-5	1	18-20	Methylene Chloride	2	100	NA
5/27/97	ST-01C-2	1	12-14	Benzo(b)fluoranthene	33	1100	220[2]

[1]Samples were analyzed for VOCs, PCBs and fingerprinted TPH (GRO and DRO)
[2]This value is based on the Human Health Guidance Value listed in STARS Memo No. 1.
NA – Not Applicable.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of sampling and analysis, it is recommended that no further investigation or remediation be performed at the Salvage and Treatment Area. Concentrations for all constituents detected in soil samples from the Salvage and Treatment Area are below guidance values provided by the State of New York.

As discussed previously, groundwater was not investigated as part of this Phase II ESA, but will be addressed as part of an ongoing feasibility study being jointly conducted by Northrop Grumman, the U.S. Navy and RUCO.

Appendix A

ANALYTICAL DATA TABLES

Appendix A.1

INITIAL SAMPLING EVENT

APPENDIX A1

Summary of Analytical Results for the Primary Sampling
Salvage and Treatment Area
Northrop Grumman GOCO Facility - Bethpage, NY

Sample ID	ST-01-1	ST-01-1 DUP	ST-01-5	ST-02A-1	ST-02A-5	ST-02B-1	ST-02B-5	NYSDEC
AOC	01	01	01	02	02	02	02	Soil
Depth (Feet BGS)	10 - 12	10 - 12	18 - 20	10 - 12	18 - 20	10 - 12	18 - 20	Cleanup
Date Collected	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	Objective (a)
Volatile Organics (ug/kg)								
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	200
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	60
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Bromoform	10 U / UJ	10 U	10 U / UJ	10 U / UJ	10 U / UJ	10 U / UJ	10 U / UJ	NL
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	300
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2700
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	600
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1700
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1900
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	300
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	200
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	400
1,2-Dichloroethene (total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	300
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5500
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1000
Methylene chloride	3 J / J	2 J / J	3 J / J	3 J / J	3 J / J	3 J / J	2 J / J	100
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	600
Tetrachloroethene	10 U	10 U	10 U	18	10 U	10 U	10 U	1400
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1500
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	800
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Trichloroethene	10 U	10 U	10 U	3 J	10 U	10 U	10 U	700
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	200
Xylenes	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1200
Total VOCs	3	2	3	24	3	3	2	10000

APPENDIX A1

Summary of Analytical Results for the Primary Sampling
Salvage and Treatment Area
Northrop Grumman GOCO Facility - Bethpage, NY

Sample ID	ST-01-1	ST-01-1 DUP	ST-01-5	ST-02A-1	ST-02A-5	ST-02B-1	ST-02B-5	NYSDEC
AOC	01	01	01	02	02	02	02	Soil
Depth (Feet BGS)	10 - 12	10 - 12	18 - 20	10 - 12	18 - 20	10 - 12	18 - 20	Cleanup
Date Collected	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	03/25/97	Objective (a)
PCBs (ug/kg)								
Aroclor-1016	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1221	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1232	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1242	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1248	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1254	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Aroclor-1260	82 U	82 U	80 U	80 U	83 U	80 U	82 U	NL
Total PCBs	0	0	0	0	0	0	0	10000
Total Petroleum Hydrocarbons (mg/kg)								
TPH (as Gasoline)	5.1 U	5.1 U	5.2 U	5.2 U	5.2 U	5.1 U	5.1 U	NL
Gasoline	5.1 U	5.1 U	5.2 U	5.2 U	5.2 U	5.1 U	5.1 U	NL
#2 Fuel Oil	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
TPH (as #2 Fuel Oil)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
#6 Fuel Oil	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
TPH (as #6 Fuel Oil)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Jet Fuel	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
TPH (as Jet Fuel)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
Lubricating Oil	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
TPH (as Lubricating Oil)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
10W40 Oil	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NL
TPH (as 10W40 Oil)	10 U	10 U	10 U	430	160	10 U	10 U	NL
Percent Moisture (%)	2.70	2.30	3.90	4.00	3.60	2.00	1.90	----

NOTES FOR APPENDIX A.1 TABLES

(a) NYSDEC TAGM #4046 "Determination of Soil Cleanup Objectives and Cleanup Levels", dated January 24, 1994 (REVISED).

NL No cleanup level is listed in TAGM #4046.

Data Qualifiers:

U Analyzed for but not detected. The value is the sample specific detection limit.

J Estimated value. The analyte was positively identified; however, the value is the approximate concentration of the analyte in the sample.

UJ Analyzed for but not detected. The value is the approximate sample specific detection limit.

Appendix A.2

SECONDARY SAMPLING EVENT

APPENDIX A2
Summary of Analytical Results for the Secondary Sampling
Salvage and Treatment Area
Northrop Grumman GOCO Facility - Bethpage, NY

Sample ID	ST-01C-1	ST-01C-2	ST-01C-2 DUP	ST-01C-3	ST-01C-4	ST-01C-5	ST-01C-6	ST-01C-7	NYSDEC
AOC	01	01	01	01	01	01	01	01	STARS
Depth (Feet BGS)	10 - 12	12 - 14	12 - 14	14 - 16	16 - 18	18 - 20	20 - 22	22 - 24	Guidance
Date Collected	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	Value (a)
Volatile Organics - Total (ug/kg)									
Benzene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	24,000
n-Butylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
sec-Butylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
tert-Butylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
Ethylbenzene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	8,000,000
Isopropylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
p-Isopropyltoluene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
Methyl t-butyl ether	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
Naphthalene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	300,000
n-Propylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
Toluene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	20,000,000
1,2,4-Trimethylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
1,3,5-Trimethylbenzene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	NL
Xylenes	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	200,000,000
m-Xylene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	200,000,000
o-Xylene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	200,000,000
p-Xylene	2 U	1.9 U	1.8 U	2 U	2 U	1.8 U	2 U	2 U	NL
Semivolatile Organics - Total (ug/kg)									
Acenaphthene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	5,000,000
Anthracene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	20,000,000
Benz(a)anthracene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	220
Benzo(a)pyrene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	61
Benzo(b)fluoranthene	340 U/UJ	33 J	340 U	350 U	340 U	340 U	340 U	340 U	220
Benzo(g,h,i)perylene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	NL
Benzo(k)fluoranthene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	220
Chrysene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	NL
Dibenz(a,h)anthracene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	14
Fluoranthene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	3,000,000
Fluorene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	3,000,000
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	NL
Naphthalene	1 U	0.95 U	0.9 U	1 U	1 U	0.91 U	1 U	1 U	300,000
Phenanthrene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	NL
Pyrene	340 U	340 U	340 U	350 U	340 U	340 U	340 U	340 U	2,000,000

APPENDIX A2
Summary of Analytical Results for the Secondary Sampling
Salvage and Treatment Area
Northrop Grumman GOCO Facility - Bethpage, NY

Sample ID	ST-01C-1	ST-01C-2	ST-01C-2 DUP	ST-01C-3	ST-01C-4	ST-01C-5	ST-01C-6	ST-01C-7	NYSDEC
AOC	01	01	01	01	01	01	01	01	STARS
Depth (Feet BGS)	10 - 12	12 - 14	12 - 14	14 - 16	16 - 18	18 - 20	20 - 22	22 - 24	Guidance
Date Collected	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	05/27/97	Value (a)
Semivolatile Organics - TCLP (mg/L)									
Acenaphthene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.02
Anthracene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05
Benz(a)anthracene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Benzo(a)pyrene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Benzo(b)fluoranthene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Benzo(g,h,i)perylene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Benzo(k)fluoranthene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Chrysene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Dibenz(a,h)anthracene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05
Fluoranthene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05
Fluorene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05
Indeno(1,2,3-cd)pyrene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.000002
Phenanthrene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05
Pyrene	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.05

NOTES FOR APPENDIX A.2 TABLES

(a) STARS Memo #1, "Petroleum-Contaminated Soil Guidance Policy", dated August 1992. For the volatile organics and the total semivolatiles, the sample results were compared to the human health guidance value. For the TCLP semivolatiles, the sample results were compared to the TCLP extraction guidance value.

NL No cleanup level is listed in STARS Memo #1.

Data Qualifiers:

U Analyzed for but not detected. The value is the sample specific detection limit.

J Estimated value. The analyte was positively identified; however, the value is the approximate concentration of the analyte in the sample.

UJ Analyzed for but not detected. The value is the approximate sample specific detection limit.

Appendix B

BOREHOLE LOGS

Radian International, LLC
Herndon, Virginia

ST-01

LOG OF BORING _____

DEPTH (ft)	USCS Code	Recovery (%)	Blows/6"	PID (ppm)	Sample Interval	Sample No.	DEPTH (ft)	SAMPLES SYMBOLS	MATERIALS DESCRIPTION
							0		Brown Dark, sandy, topsoil-like, some Gravel
5							5		Yellow/light brown coarse Sand, some gravel
10							10		Yellow/darker brown Coarse, some gravel
15							15		Yellow/darker brown Coarse, some gravel
20							20		

PROJECT NG Salvage and Treatment
LOCATION AOC-2
JOB NUMBER
GEOLOGIST M COLONNA
DRILL RIG Geoprobe

DRILLING COMPANY Zebra
DATE DRILLED 2-25-97
SURFACE ELEVATION
TOTAL DEPTH OF HOLE 20'
WATER LEVEL

Radian International, LLC
Herndon, Virginia

ST-02A

LOG OF BORING _____

DEPTH (ft)	USCS Code	Recovery (%)	Blows/6"	PID (ppm)	Sample Interval	Sample No.	DEPTH (ft)	SAMPLES SYMBOLS	MATERIALS DESCRIPTION
5							5		
10							10		Pushed blind to 10' Yellow / brown, sandy with some gravel
15							15		Brown, sandy with some silt and gravel slightly moist
20							20		

PROJECT Northrop Grumman
LOCATION Salvage and Treatment Area
JOB NUMBER _____
GEOLOGIST M. COLONNA
DRILL RIG Geoprobe

DRILLING COMPANY Zebra
DATE DRILLED 3/25/97
SURFACE ELEVATION _____
TOTAL DEPTH OF HOLE 20'
WATER LEVEL _____

Radian International, LLC
Herndon, Virginia

ST - 02B

LOG OF BORING _____

DEPTH (ft)	USCS Code	Recovery (%)	Blows/6"	PID (ppm)	Sample Interval	Sample No.	DEPTH (ft)	SAMPLES SYMBOLS	MATERIALS DESCRIPTION
5							5		Pushed Blind to 10'
10							10		Yellow/brown, sandy with some gravel
15							15		Dark brown, sandy w.h some silt and gravel. slightly moist
20							20		

PROJECT Northrop Grumman
LOCATION Salvage and Treatment -AOC 1
JOB NUMBER _____
GEOLOGIST MCOLOMNA
DRILL RIG Geoprobe

DRILLING COMPANY Zebra
DATE DRILLED 3/25/97
SURFACE ELEVATION _____
TOTAL DEPTH OF HOLE 20'
WATER LEVEL _____

Radian International, LLC
Herndon, Virginia

ST-01C

LOG OF BORING _____

Page 1 of 0

DEPTH (ft)	USCS Code	Recovery (%)	Blows/6"	PID (ppm)	Sample Interval	Sample No.	DEPTH (ft)	SAMPLES SYMBOLS	MATERIALS DESCRIPTION
									Dark brown, coarse sand with some silt and gravel moist
									Bottom
5							25		
									Pushed Blind to 10'
10							30		
									light brown, sandy with some gravel
									light brown, sandy with some gravel, slightly moist
15							35		
									Darker brown coarse sand with some silt and gravel slightly moist
20							40		

PROJECT Northrop grumman
LOCATION Sewage and Treatment
JOB NUMBER _____
GEOLOGIST M Colon NA
DRILL RIG Geoprobe

DRILLING COMPANY Zebra
DATE DRILLED _____
SURFACE ELEVATION _____
TOTAL DEPTH OF HOLE 24'
WATER LEVEL _____

Appendix C

CHAIN OF CUSTODY FORMS

nytest environmental inc
(516) 625-5500 FAX: (516) 625-1274

Chain of Custody Record

page #: ____ of ____

Client Name: Northrop Grumman
Address:
Project Manager: Susan Andrechak
Phone: (703) 713-6417 FAX (703) 713-1512
Project Name: Northrop Grumman Phase II (Salvage and treatment)
Project Number:
P.O. #:
Analytical Protocol: ____ Deliverables: ____
Sampled By: MARK COLONNA

Login #: 30869
Ship to:
Nytest Environmental Inc.
60 Seaview Blvd
Port Washington N.Y. 11050
Attn.: Sample Control
Date Shipped:
Carrier:
Air Bill #:
Cooler #:
C of C #:
SDG #:
NEI QT #:

Analysis Requested / Bin #'s In/Out (For Lab Use Only)

Lab ID (Lab Use Only)	Sample ID (Maximum of 6 Characters)	Date Sampled	Time Sampled	Sample Description	No. of Containers	VOCs	TPH GRO/DRO	PCBs	Comments
1	ST011	3/25	900	SOIL-AOC1-(10-12)	3	X	X	X	
2	ST011A	3/25	900	SOIL-AOC1-(10-12)	3	X	X	X	Duplicate
3	ST015	3/25	930	SOIL-AOC1-(18-20)	3	X	X	X	
	~~ST015~~	~~3/25~~	~~930~~	~~SOIL-AOC1~~	~~3~~	X	X	X	VOID This line
4	STU2A1	3/25	1000	SOIL-AOC2A (10-12)	3	X	X	X	
5	STU2A5	3/25	1000	SOIL AOC2A-(18-20)	3	X	X	X	
6	ST02A5	3/25	1000	SOIL-AOC2A-(18-20) MS	3	X	X	X	MS
7	ST02A5	3/25	1000	SOIL-AOC2A-(18-20) MSD	3	X	X	X	MSD
8	ST02B1	3/25	1100	SOIL-AOC2B (10-12)	3	X	X	X	
9	ST02B5	3/25	1200	SOIL-AOC2B (18-20)	3	X	X	X	

Relinquished by	Date / Time	Received by	Date / Time
Relinquished by: [signature] Print Name: MARK COLONNA	3/25/97 1700	Received by: [signature] Print Name: [signature]	3/26/97 [illegible]
Relinquished by: [signature] Print Name: [signature]	3/26 [illegible]	Received by: Print Name:	
Relinquished by: Print Name:		Received by Laboratory: [signature] Print Name: Robert Fletcher	3/26/97 1000

Lab Use Only
Custody Seals: (Intact) Broken Absent
Sample Rec'd in Good Condition?: (Y) N
Sample Temperature: 4 Degrees Celsius
INSPECTED BY: [initials]
COMMENTS:

Special Instructions:

0001005

CLIENT RETAINS YELLOW COPY ONLY

[redacted]

RECRA LABNET, a division of Recra Environmental, Inc.

CHAIN OF CUSTODY RECORD

PROJECT NO: 800

SITE NAME: Northrop Grumman

SAMPLERS (SIGNATURE): MARK COLONNA

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	STARS - 8201 - (total TCLP)	STARS - 8270 - (total/TCLP)	Mercury	REMARKS
ST	5/27			X	ST-01C-1	2	X	X		
ST	5/27			X	ST-01C-2	2	X	X		
ST	5/27			X	ST-01C-2	2	X	X		Duplicate
ST	5/27			X	ST-01C-3	4	X	X		sample + MS/MSD
ST	5/27			X	ST-01C-4	2	X	X		
ST	5/27			X	ST-01C-5	2	X	X		
ST	5/27			X	ST-01C-6	2	X	X		
ST	5/27			X	ST-01C-7	2	X	X		
~~20~~	~~5/27~~			X	20-RS2D-1	1			X	(Copy of ST-01C-7)
~~20~~	~~5/27~~			X	20-RS2D-2	1			X	
~~20~~	~~5/27~~			X	20-RS2D-3	1			X	
~~20~~	~~5/27~~			X	20-RS2D-4	1			X	
~~20~~	~~5/27~~			X	20-RS2E-1	1			X	
~~20~~	~~5/27~~			X	20-RS2E-2	1			X	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Mark C	5/27 6PM				
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS	
			5/28/97 1000	Cooler = 6°C	

Distribution: Original accompanies shipment copy to coordinator field files

020024

Appendix D

DATA VALIDATION REPORTS

INTRODUCTION

This appendix summarizes the results of data validation performed on data from samples collected at the Salvage and Treatment Area. A review of sample custody, laboratory performance and basic quality control parameters was conducted on 100% of the samples from the one sample delivery group (SDG). This included review of accuracy information from matrix spike/matrix spike duplicate (MS/MSD) samples, blank spikes and surrogates; precision information from MS/MSD sample, and field and laboratory duplicate sets; initial and continuing calibration performance; instrument tune and internal standard information for GC/MS analyses; and method and instrument blank contamination. Additionally, 20% of the samples from the SDG received a full review including documentation, completeness, and transcription and calculation checks.

Data validation was based on the quality control (QC) criteria documented in the methods listed above, the laboratory QC criteria, Region II Functional Guidelines (1992) and National Functional Guidelines (1994). Data qualities were assigned according to the Region II or the National Functional Guidelines.

General Findings

Several of the Laboratory Narratives and NYSDEC Forms submitted by NEI did not accurately summarize the submitted data. Some corrected Narratives were resubmitted by the laboratory to EcoChem and Radian upon the request of Steve Falatko of Radian. Since this was a documentation and completeness issue which did not affect data quality, no action was taken other than to note the inaccuracies in the data validation worksheets.

The percent completeness was 100 percent, excluding common laboratory contaminants reported as Tentativley Identified Compounds. The majority of the qualified data were qualified as estimated on the basis of: calibration outliers.

METHOD REFERENCES

U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, November 1996. *Test Methods for Evaluating Solid Water, Physical/Chemical Methods, SW-846, 3rd Edition*. Washington, DC.

New York State Department of Environmental Conservation, 1991. *Analytical Services Protocol*, New York.

U.S. Environmental Protection Agency, *Contract Laboratory Program Organics Data Review, Revision 8; Region II guidelines.*

U.S. Environmental Protection Agency, *Contract Laboratory Program Metals Data Review, Revision 8; Region II guidelines.*

U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, February 1994. *National Functional Guidelines for Organic Data Review.* Washington, D.C.

Appendix D.1

INITIAL SAMPLING EVENT

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment
Volatile Organic Compounds
Matrix: Soil
SDG Nos.: ST-1

This report documents the review of analytical data from the analysis of soil samples for volatile organic compounds by Nytest Environmental, Inc. The samples that received a full review including calculations, transcriptions, and compound identification are indicated in the **Sample Index**.

I. CCS/COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes, and anomalies were discussed in the case narrative.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

- Technical Holding Times
- GC/MS Instrument Performance Check
- Initial Calibration
- * Continuing Calibration
- * Blanks (Method)
- Surrogate Compounds
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Internal Standards
- Field Duplicates
- Compound Quantitation and Certified Reporting Limits (CRL)
- * Tentatively Identified Compounds (TIC)
- Calculation and Transcription Checks

Those items marked with an asterisk (*) did not meet all specified QC criteria and are discussed below. QC items not marked with an asterisk meet all QC criteria. Qualified data are summarized in **APPENDIX B**.

Continuing Calibration

In several continuing calibration analyses, the percent difference (%D) values for several compounds were outside the control limit of ±25%. For compounds with a %D value outside the

±25% criterion, results were qualified as estimated (J/UJ-5B). The outlying compounds and qualifiers are listed in the Data Validation Worksheets.

Blanks (Method)

For target compounds detected in the method blanks, action levels were established at ten times the concentration for common laboratory contaminants (toluene, methylene chloride, acetone, and 2-butanone) as a basis for evaluating associated sample results. Action levels of five times the blank concentration were established for other compounds. Results that were less than the action levels were qualified as not-detected (U-7) in associated samples for results that were elevated to the reporting limit.

Tentatively Identified Compounds (TIC)

Common laboratory contaminants reported as TIC (for example, siloxanes) were rejected (R-14). All remaining TIC were qualified as estimated (JN-14).

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified analytical method. The matrix spike/matrix spike duplicate (MS/MSD) relative percent difference (RPD) results indicated acceptable laboratory precision. Accuracy is also acceptable, as demonstrated by the surrogate, MS/MSD, and laboratory control sample (LCS) spike recovery results.

Data were qualified because of calibration outliers and blank contamination.

The data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment
Polychlorinated Biphenyl Compounds
Matrix: Soil
SDG No.: ST-1

This report documents the review of analytical data from the analysis of soil samples for polychlorinated biphenyl compounds by Nytest Environmental, Inc. The samples that received a full review including calculations, transcriptions, and compound identification are indicated in the **Sample Index**.

I. CCS/COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes, and all anomalies were discussed in the case narrative.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

- Technical Holding Times
- Initial Calibration
- Continuing Calibration
- Blanks (Method and Field)
- * Surrogate Compounds
- * Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Field Duplicates
- Compound Quantitation and Contract-Required Quantitation Limits (CRQL)
- Calculation and Transcription Checks

Those items marked with an asterisk (*) did not meet all specified QC criteria and are discussed below. QC items not marked with an asterisk meet all QC criteria. Qualified data are summarized in **APPENDIX B**.

Surrogate Compounds

The percent recovery (%R) values for both surrogates were greater than the upper control limits for Sample ST02B1. There were not any positive results in the sample, and the reporting limits were judged not to be affected. No action was taken.

Matrix Spikes/Matrix Spike Duplicates

A matrix spike/matrix spike duplicate (MS/MSD) was performed using Sample ST02A5. The relative percent difference (RPD) value for Aroclor 1016 was greater than the control limit. Since there were not any positive results in associated samples and the reporting limits were judged not to be affected, no action was taken.

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified analytical method.

The accuracy was acceptable, as demonstrated by the compliant percent recovery (%R) values of laboratory control sample (LCS) and matrix spiking compounds, and most of the surrogate spiking compounds. The precision was acceptable, as demonstrated by the AR1260 RPD values for the MS/MSD set and the field duplicate pair.

The data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment
Diesel Range Organic Compounds
Matrix: Soil
SDG No.: ST-1

This report documents the review of analytical data from the analysis of soil samples for diesel range organic compounds by Nytest Environmental, Inc. The samples that received a full review including calculations, transcriptions, and compound identification are indicated in the **Sample Index**.

I. CCS/COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes and all anomalies were discussed in the case narrative.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

- Technical Holding Times
- Initial Calibration
- Continuing Calibration
- Blanks (Method and Field)
- Surrogate Compounds
- * Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples
- Field Duplicates
- * Compound Quantitation and Contract-Required Quantitation Limits (CRQL)
- Calculation and Transcription Checks

Those items marked with an asterisk (*) did not meet all specified QC criteria and are discussed below. QC items not marked with an asterisk meet all QC criteria. No data were qualified.

Matrix Spikes/Matrix Spike Duplicates

A matrix spike/matrix spike duplicate (MS/MSD) was performed using Sample ST02A5. The relative percent difference (RPD) value (34%) was outside the control limit of 20%. Also, the percent recovery (%R) values for the MS (134%) and MSD (188%) were each greater than the upper control limit of 120%. The outlying values were attributed to the high concentration of

petroleum hydrocarbons present in the parent sample. Results for associated samples were judged not to be affected and no action was taken.

Compound Quantitation and Contract-Required Quantitation Limits (CRQL)

Samples ST02A1 and ST02A5 were each identified as 10W40 lubrication oil. Although the pattern of these samples is similar to 10W40, the elution of the petroleum hydrocarbons is earlier than the reference 10W40 standard analyzed at the time of the initial calibration. No further action was taken other than to note that the petroleum hydrocarbons in these samples may indicate another type of product.

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified analytical method. Laboratory precision could not be evaluated because of the high concentration of target compounds in the MS/MSD parent sample. Accuracy is acceptable, as demonstrated by the surrogate and laboratory control sample (LCS) spike recovery results.

The data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment
Gasoline Range Organic Compounds
Matrix: Soil
SDG Nos.: ST-1

This report documents the review of analytical data from the analysis of soil samples for gasoline range organic compounds by Nytest Environmental, Inc. The samples that received a full review including calculations, transcriptions, and compound identification are indicated in the **Sample Index**.

I. CCS/COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes and all anomalies were discussed in the case narrative.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below. All criteria were met for all QC requirements.

Technical Holding Times
Initial Calibration
Continuing Calibration
Blanks (Method and Field)
Surrogate Compounds
Matrix Spikes/Matrix Spike Duplicates
Laboratory Control Samples
Field Duplicates
Compound Quantitation and Contract-Required Quantitation Limits (CRQL)
Calculation and Transcription Checks

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified analytical method. The matrix spike/matrix spike duplicate (MS/MSD) relative percent difference (RPD) results indicated acceptable laboratory precision. Accuracy is also acceptable, as demonstrated by the surrogate, MS/MSD, and laboratory control sample (LCS) spike recovery results.

The data, as reported, are acceptable for use.

Appendix D.2

SECONDARY SAMPLING EVENT

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment Area
STARS Volatile Organics
Matrix: Soil
SDG No.: ST01C1

This report documents the review of analytical data from the analyses of soil samples for volatile organic compounds by Recra Environmental, Inc. All samples which were analyzed in this SDG and for which data were evaluated are listed in **Appendix A**. The samples that received full validation including calculations, transcriptions, and compound identification are also listed in **Appendix A**.

I. COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

Technical Holding Times
GC Instrument Performance Check
Initial Calibration
Initial and Continuing Calibration Verification
Blanks (Method)
*Surrogate Compounds
Laboratory Control Samples (LCS)
Matrix Spike/Matrix Spike Duplicates (MS/MSDs)
Field Duplicates
Compound Quantitation and Certified Reporting Limits (CRL)
Calculation and Transcription Checks (for 20% of the field samples)

Those Items marked with an asterisk (*) did not meet all specified QC criteria and are discussed below. QC items not marked with an asterisk meet all QC criteria. No data required qualification based on QC results.

SURROGATE COMPOUNDS

The %D for all surrogates in the ICV (A7D0000391-1) and the CCVs (A70001346 and A70001347) were outside the laboratory acceptance criteria (not given in report). The %D and average RRF for all target analytes in the ICV and CCVs met the acceptance criteria of the laboratory. Also, surrogate recoveries in all field samples were within acceptance criteria. No data were qualified based on the ICV and CCV results.

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified method and the data are acceptable for use.

Precision was acceptable, as demonstrated by the RPD values of the MS/MSD analysis. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD spike recovery results.

It was noted that on the COC method 8201 was requested for these samples. The laboratory correctly performed method 8021.

It was noted that the average CF and %RSD on the summary forms did not exactly match the raw data. The differences were due to software limitations on the summary form. The summary form only allows for 5 points to be recorded and used for the calculation of the average CF and %RSD while the raw data includes 6 points in these calculations. The differences are minimal and all average CF and %RSD were acceptable.

APPENDIX A

SAMPLE INDEX

SDG	Sample	Matrix	STARS VOC	SVOC	PCB	TPH-Fuel	TPH-Gas	Pest	PP metals	Cyanide
ST01C1	ST-01C-1	soil	√							
ST01C1	ST-01C-2	soil	√							
ST01C1	ST-01C-2DUP	soil	√							
ST01C1	ST-01C-3	soil	√ * MSD							
ST01C1	ST-01C-4	soil	√ *							
ST01C1	ST-01C-5	soil	√							
ST01C1	ST-01C-6	soil	√ *							
ST01C1	ST-01C-7	soil	√							

* Indicates that level 4 validation was performed on this sample.

DATA VALIDATION REPORT
Northrop Grumman Salvage and Treatment Area
STARS Semivolatile Organic Compounds
Matrix: Soil
SDG No.: ST01C1

This report documents the review of analytical data from the analyses of soil samples for semivolatile organic compounds by Recra Environmental, Inc. All samples which were analyzed in this SDG and for which data were evaluated are listed in **Appendix A**. The samples that received full validation including calculations, transcriptions, and compound identification are also listed in **Appendix A**.

I. COMPLETENESS

All contract-required deliverables were submitted by the laboratory. The laboratory followed contract-required corrective action processes.

II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

Technical Holding Times
GC/MS Instrument Performance Check
*Initial Calibration
*Continuing Calibration Verification
Blanks (Method)
Surrogate Compounds
*Laboratory Control Samples (LCS)
*Matrix Spike/Matrix Spike Duplicates (MS/MSDs)
Internal Standards
Field Duplicates (none were submitted for analysis as part of this SDG)
*Compound Quantitation and Certified Reporting Limits (CRL)
Calculation and Transcription Checks (for 20% of the field samples)

Those Items marked with an asterisk (*) did not meet all specified QC criteria and are discussed below. QC items not marked with an asterisk meet all QC criteria. Data points requiring qualification are listed in **Appendix B**.

INITIAL CALIBRATION

In the initial calibration analysis of 6/5/97, the average RRF of benzo(g,h,i)perylene was 0.3820 and was less than the minimum value of 0.500. The method allows for up to four compounds to fail as long as the RRF is > 0.010, so the laboratory was in compliance. No field samples were quantitated using this calibration curve, so no data points required qualification.

CONTINUING CALIBRATION

In the continuing calibration analyses of 6/7/97 the relative response factor for two compounds [indeno (1,2,3-cd) pyrene and benzo (g,h,i) perylene] were less than the minimum acceptance criteria (0.500). The method allows for up to four compounds to fail as long as the RRF is > 0.010, so the laboratory was in compliance. No field samples were analyzed on 6/7/97, so no data points required qualification.

LABORATORY CONTROL SAMPLES (MATRIX SPIKE BLANKS)

It was noted that the reported QC limits did not match those given in the ASP, p. D-III-70. All recoveries were within the limits given in the ASP, so no data points required qualification.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

(Method 8270 TCLP Stars Table 2 List Only)

Pyrene was qualified by the laboratory as being recovered outside the upper QC limit at 126 and 123%. However, these recoveries were within the limits stated in the ASP (page D-III-69; 35-142%), so no data points required qualification.

COMPOUND QUANTITATION

It was noted that the laboratory used the average RRF from the most recent CCV to calculate analyte concentrations. Method ASP 95-2 specifies the use of the RRF from the most recent CCV. Since the calculation was performed consistently by the laboratory, no action was taken.

Benzo(b)fluoranthene was quantitated in sample ST-01C-2 at a concentration less than the detection limit. This data point was qualified J-11.

Overall Assessment

On the basis of this evaluation, the laboratory followed the specified method.

Precision was acceptable, as demonstrated by the RPD values of the MS/MSD analysis. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD spike recovery results.

The data, as qualified, are acceptable for use.

APPENDIX A

SAMPLE INDEX

SDG	Sample	Matrix	VOC	SVOC	PCB	TPH-Fuel	TPH-Gas	Pest	PP metals	Cyanide
Method 8270-Stars Table 2 List										
ST01C1	ST-01C-1	soil		√						
ST01C1	ST-01C-2	soil		√ *						
ST01C1	ST-01C-2DUP	soil		√						
ST01C1	ST-01C-3	soil		√						
ST01C1	ST-01C-4	soil		√						
ST01C1	ST-01C-5	soil		√						
ST01C1	ST-01C-6	soil		√						
ST01C1	ST-01C-7	soil		√						
Method 8270-TCLP Stars Table 2 List										
ST01C1	ST-01C-1	soil		√						
ST01C1	ST-01C-2	soil		√						
ST01C1	ST-01C-2DUP	soil		√						
ST01C1	ST-01C-3	soil		√ * (MS)						
ST01C1	ST-01C-4	soil		√						
ST01C1	ST-01C-5	soil		√						
ST01C1	ST-01C-6	soil		√						
ST01C1	ST-01C-7	soil		√						

* Indicates that level 4 validation was performed on this sample.

APPENDIX B

SUMMARY OF QUALIFIED DATA

Sample ID	Lab ID	Matrix	Method	Analyte	Concentration (ug/kg)	Lab Qualifier	Validation Qualifier
Method 8270-Stars Table 2 List							
ST-01C-1	A7184501	Soil	ASP95	Benzo(b)fluoranthene	33	J	J-11