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ENVIRONMENTAL

APR

Mr. Girish Desai
New York State Department of Environmental Conservation
Building 40, State University of New York at Stony Brook
Stony Brook, New York 11790

Subject:
Supplemental Operable Unit 2 Remedial Investigation Work Plan,
Unisys Inactive Hazardous Waste Site No.1-30-0-045, Great Neck, New York.
ARCADIS Geraghty & Miller Project No. NY001228.00OA

Date,
1 April, 1999

Contact:
Carlo San Giovanni

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Dear Mr. Desai:

ARCADIS Geraghty & Miller, Inc. has prepared this Supplemental Operable Unit 2 (OU-2) Remedial Investigation (RI) Work Plan (Supplemental Work Plan) for the Lockheed Martin Corporation site (Lockheed Martin) in Great Neck, New York (see Figure 1). This Supplemental Work Plan is an addendum to the January 1998 OU-2 RI/Feasibility Study (FS) Work Plan (1998 Work Plan) prepared by H2M Group. Where applicable, the approved procedures and methods described in the 1998 Work Plan have been referenced in this Supplemental Work Plan. Methods and new procedures proposed for the supplemental RI work scope are described in this Supplemental Work Plan.

This Supplemental Work Plan has been prepared to address off-site (designated as OU-2) data gaps in groundwater quality. The objectives of this Supplemental Work Plan are as follows:

- Determine the nature and extent of the downgradient, off-site volatile organic compound (VOC) plume in the area north of the Northern State Parkway and south of the Lake Success Junior High School (see Figure 2) by collecting additional groundwater quality data.

- Collect additional groundwater quality data that will be used as part of the FS remedial alternative evaluation process and used to verify the existing contaminant transport model developed for OU-2.

Site Description

The Lockheed Martin site is located at 365 Lakeville Road in Nassau County, New York. The site is bounded by Marcus Avenue to the north, Union Turnpike to the south, Lakeville Road to the west and the Triad office park to the east. The site location is presented on Figure 1.

Scope of Work

To satisfy the objectives discussed above, a total of nine monitoring wells (to be designated as Monitoring Wells 37GL, 37MI, 37ML, 38GL, 38MI, 38ML, 39GL, 39MI, and 39ML) will be installed off-site in three triplet clusters at locations shown on Figure 2. In addition, a synoptic round of water-level measurements and groundwater quality samples will be collected from the existing and new on- and off-site monitoring wells and from the existing applicable supply wells.

Methodology

Monitoring Well Installation

This section describes the methods to be used to drill, install and develop the proposed monitoring wells.

Access and Permits

Site access agreements will be secured by ARCADIS Geraghty & Miller, in coordination with land owners and the NYSDEC, prior to mobilizing to the monitoring well locations for drilling. Identification and mark-out of underground utilities will be coordinated by ARCADIS Geraghty & Miller, the land owners, and New York State Call Before You Dig. The appropriate monitoring well drilling and installation permits will be obtained by the well drilling contractor.

Monitoring Well Drilling

Proposed monitoring well construction specifications are provided in Table 1. Monitoring well cluster locations are shown on Figure 2. Three monitoring wells will be installed at each cluster location. Each monitoring well cluster will consist of a monitoring well installed in the upper glacial zone (designated with the suffix GL), the intermediate-Magothy zone (designated with the suffix MI), and the lower-Magothy zone (designated with the suffix ML). The approximate vertical extent of each zone is defined as follows: the upper glacial zone extends from 60 to -10 feet

relative to mean sea level (ft rmsl), the upper-Magothy aquifer zone extends from -10 to -100 ft rmsl, and the lower-Magothy zone extends from -100 to -280 ft rmsl.

At each monitoring well cluster location, the deep well borehole will be drilled first to determine the lithologic and geophysical characteristics (depth and thickness of water-bearing zones) of the monitoring well cluster drilling site. Well depths and screened intervals for the well cluster will be determined from interpretation of the geophysical (i.e., natural gamma and electric) log obtained from the deep well borehole at that cluster, as described in Section 6.2 (Geophysical Surveying) of the 1998 Work Plan. If the deep monitoring well borehole is not drilled first, each borehole drilled prior to the deepest borehole will be geophysically logged.

The deep and intermediate monitoring well boreholes will be drilled by a mobile drilling rig using the mud rotary drilling methodology, as described in Section 6.1 (Well Drilling and Construction) of the 1998 Work Plan. Each borehole diameter will be a minimum of 8 inches to accommodate the 4-inch diameter well. During drilling, the ARCADIS Geraghty & Miller field hydrogeologist will maintain a continuous log of the borehole lithology through inspection and classification of drill cuttings exiting the borehole. The drilling penetration rate will also be recorded. As drilling depth approaches the proposed screened interval, the drilling mud mixture will be gradually thinned to avoid excessive build-up of filter cake and facilitate monitoring well development (only polymer-free bentonite drilling mud will be used). Based on field conditions, each borehole may be over-drilled.

Once the total depth of the deep borehole is attained, a geophysical log will performed (gamma log), as described in Section 6.2 (Geophysical Surveying) of the 1998 Work Plan. In addition to the gamma log, a spontaneous potential and single-point resistance (electric) log will be run concurrently with the gamma log. The electric log will further assist in identifying the depth and thickness of water-bearing zones.

The shallow monitoring well borehole will be drilled by a mobile drilling rig using hollow-stem auger drilling methodology. The inner diameter of the augers will be a minimum of 6-5/8 inches and the outside diameter will be 8 inches. The selected monitoring well depth and screened interval will be determined, in consultation with the NYSDEC, from interpretation of the geophysical logs obtained at that well cluster location.

To accurately estimate the correct elevation to install each screen zone, the monitoring well cluster location land surface elevation will be surveyed by a new York licensed surveyor prior to selection of a screen zone.

Monitoring Well Installation

Monitoring wells will be constructed of 4-inch diameter, Schedule 80 polyvinyl chloride (PVC) casing and a 20-foot long section of 0.020-slot screen, as described in Section 6.1 (Well Drilling and Construction) of the 1998 Work Plan.

Once the well casing and screen have been installed, the well pack will be emplaced in the annulus of the borehole and well screen using a tremie pipe. Gravel pack grain size will be equivalent to Morie No. 2 gravel. For the shallow monitoring wells, the gravel pack shall be emplaced to a depth equivalent to 5 ft above the top of the monitoring well screen, or approximately 25 feet in length. To ensure that bentonite seal does not intrude into the gravel pack, ARCADIS Geraghty & Miller will coordinate with the monitoring well drilling contractor for the length of the gravel pack. Based on past experience for monitoring wells installed at these depths, the gravel pack will be approximately 5 ft above the top of the screen zone for shallow monitoring wells; approximately 10 ft above the top of the well screen for intermediate monitoring wells, and the gravel pack should be approximately 20 ft above the top of the well screen for deep monitoring wells.

When the gravel pack is in place, a fine sand seal shall be emplaced in the annulus using a tremie pipe. The fine sand grain size should be equivalent to Morie No. 00 sand. To ensure that bentonite seal does not intrude into the gravel pack, ARCADIS Geraghty & Miller will coordinate with the well drilling contractor for the length of the fine sand seal. Based on past experience for monitoring wells installed at these depths, the fine sand seal will be approximately 3-ft in length for the shallow monitoring wells; approximately 5-ft in length for intermediate monitoring wells; and approximately 10-ft in length for deep monitoring wells.

Once the fine sand seal is in place, a 3-ft length of 100% polymer-free bentonite slurry seal will be emplaced in the annulus using a tremie pipe. Once the bentonite slurry seal is in place, the remaining annulus (to 2 ft bls) will be emplaced using a 95 percent/5 percent cement/bentonite grout slurry. Cement used will be equivalent to Portland Type III. Only 100 percent polymer-free bentonite will be used. Grout will be emplaced using a tremie pipe. ARCADIS Geraghty & Miller will coordinate with the monitoring well drilling contractor during installation of the cement/bentonite grout slurry. Well installation will be a continuous process until after the complete bentonite grout seal is in place. Prior to installation of the protective casing, the grout will be allowed to cure for 24 hours.

Each monitoring well surface protective casing shall be installed using methods and materials described in the 1998 Work Plan.

Following the completion of the monitoring wells, the location, measuring point and land surface elevation will be surveyed by a New York licensed surveyor, as described in Section 6.4.1 (Well Elevation Survey) of the 1998 Work Plan.

Monitoring Well Development

Each monitoring well will be developed by the monitoring well drilling contractor with oversight provided by an ARCADIS Geraghty & Miller field hydrogeologist a minimum of 24 hours after installation is complete. The monitoring wells will be aggressively developed through use of air lift methods in combination with pumping and surging methods, as described in Section 6.1 (Well Drilling and Construction) of the 1998 Work Plan. During air lift development, the well driller will insert a slotted pipe into the well screen to jet compressed air laterally within the screen, thereby dislodging fines, and drilling mud residue from the drilling process and then lifting discharging sediment out of the well casing and out through the top of the well casing at land surface. The air compressor (equipped with an in-line oil filter) will be periodically turned on and off during development to expedite removal of particles.

The monitoring wells will be developed so as to maximize yield, remove all traces of drilling fluid, and until field parameters (i.e., pH, specific conductance, temperature and turbidity) have stabilized (i.e., three consecutive well readings within 10 percent). Field parameters will be periodically recorded on development logs by ARCADIS Geraghty & Miller, who will determine when development is complete.

Groundwater Sampling

Groundwater samples will be collected from the 74 existing monitoring wells installed as part of the OU-1 RI and OU-2 RI and from the nine new monitoring wells, for a total of 83 wells. If access is provided and sampling is practicable, groundwater samples will also be collected from water supply wells and irrigation supply wells north and west of the site. Concurrent to the monitoring well groundwater sampling event, ARCADIS Geraghty & Miller will coordinate with the Water Authority of Great Neck North (WAGNN) and the Water Authority of Western Nassau County (WAWNC) to obtain the most recent round of water quality data collected from the domestic, industrial, and municipal wells as, listed in the OU-1 RI Report (LBG 1995). A complete list of wells included in this groundwater sampling event is provided in Table 2. The locations of all wells to be sampled are provided on Figure 2. This section of the Supplemental Work Plan provides a

description of the methods to be used to purge the monitoring wells and collect groundwater samples.

Water levels will be collected from each well prior to sampling. As the proposed new monitoring wells may not be installed until after the start of the groundwater sampling task, a synoptic round of water levels will be collected from all available wells at the conclusion of the proposed groundwater sampling program.

Evacuation and collection of groundwater samples from monitoring wells will be conducted in accordance with the 1995 United States Environmental Protection Agency (USEPA) Region II Draft Groundwater Sampling Procedure for Low-Flow Pump Purging and Sampling, as discussed below.

Pre-sampling activities include accessing the well, preparing the site for purging and sampling, and collecting initial measurements. To access the well, the protective casing will be unlocked and any surficial dirt will be cleaned from around the wellhead. Plastic sheeting will be placed around the well and secured at the corners. The depth to water in the well will be measured to the hundredth of a foot with an electronic water-level indicator and the total depth of the well will be sounded.

Depending on the total depth of the well, one of two types of submersible pumps will be used for purging and sampling. For wells with a total depth less than 300 ft bls, a variable speed, 2-inch diameter, stainless steel Grundfos RediFlo submersible pump will be placed in the screen interval and used to purge the well, in accordance with USEPA (1995) Micropurge procedures. Disposable ½-inch diameter polyethylene tubing will be connected to the pump and both will be gradually lowered so as to place the pump intake within the center of the well screen zone.

For wells deeper than 300 ft bls, a separate 2-inch diameter, stainless steel Grundfos RediFlo submersible pump equipped with a 2-inch diameter, 5-foot long American National Standards Institute (ANSI)-grade Schedule 40 PVC remote casing/drop tube assembly (see Figure 3) will be used. The remote casing/drop tube assembly will serve to extend the pump intake into the screen zone, thereby isolating formation water in the screen zone from standing water within the well casing by extending the submersible pump intake to draw water directly from the well screen zone. A dedicated, ½-inch diameter polyethylene drop tube and 2-inch diameter stainless steel screen assembly will be threaded (using brass fittings) onto the base of the remote casing assembly, extending the pump intake to the well screen zone. An 1/8-inch PVC air vent line will be installed at the top of the remote casing assembly and be extended from the casing to land surface. Dedicated, ½-inch diameter polyethylene discharge tubing will be attached to the top of the pump, extending to land surface. The pump will be submerged to approximately 200 to 300 feet below the water table, secured at the wellhead, and the motor lead and

discharge tubing will be connected to the control box, and flow-through cell, respectively. A schematic of the submersible pump and remote casing/drop tube assembly is provided as Figure 3. The remote casing/drop tube assembly is needed to micropurge/low-flow sample wells with screened intervals greater than 300 ft bls, because due to voltage loss, the Grundfos Rediflo submersible pumps will not operate at depths greater than 300 ft bls.

With either pump, the purge rate will not exceed 500 milliliters per minute (mL/min). The volume of the drop tube and, for wells deeper than 300 ft bls, the remote casing, will be calculated and a single volume will be purged prior to monitoring field parameters. A flow-through cell will be used to record all field parameters. Field parameters (i.e., pH, specific conductance, dissolved oxygen [DO], oxidation-reduction potential [redox], and temperature) will be measured, with calibrated meters, from the flow-through cell approximately every five minutes until three consecutive readings within 10 percent are observed. Following stabilization of field parameters, the flow rate will be decreased to 100 mL/min to allow groundwater sampling to take place. All samples will be collected from the pump discharge. Once sampling is complete, the pump will be gradually removed from the well. The drop tube assembly will be dedicated to each well, and the tubing and screen assembly will be disconnected from the pump and secured inside the well casing.

The wells will be locked when sampling is completed. Samples will be placed on ice in a cooler, and information on the Water Sampling Log and chain-of-custody form will be completed. Samples will be sent via overnight delivery to the analytical laboratory.

Analytical Parameters

Groundwater samples will be analyzed for Target Compound List (TCL) VOCs, plus Freon 113 (trichlorotrifluoromethane) using NYSDEC Analytical Services Protocol (ASP) Method 95-1, as described in the 1998 Work Plan.

Groundwater Quality Data Comparative Analysis

To provide the NYSDEC with a comparative data analysis between Micropurge/low-flow and conventional (describe below) groundwater sampling method, a second set of groundwater samples will be collected from Monitoring Wells 15GL, 28GL, and 32GL. After evacuating these wells and collecting groundwater samples using USEPA Micropurge/low-flow sampling methods, these three monitoring wells will also be sampled using conventional pump set-up and monitoring well evacuation/sampling methods described in Section 6.3 (Groundwater Sampling) of the 1998 Work Plan. The groundwater samples

collected using low-flow sampling at these three monitoring wells will be designated with a "LF" suffix (e.g., 15GL-LF).

Both sets of groundwater samples will be submitted under chain-of-custody protocols for laboratory analysis for TCL VOCs, plus Freon 113 using NYSDEC ASP Method 95-1.

Quality Assurance/Quality Control

The 1998 Work Plan describes reporting limits, quality control sampling frequency and protocols. An addendum to the QA/QC procedures set forth in the 1998 Work Plan has been prepared and is included as Appendix A of this Supplemental Work Plan (QAPP addendum). This QAPP addendum supersedes the methods and procedures in the 1998 Work Plan, where applicable.

Decontamination

The drilling rig and all drilling and down-hole tools will be inspected by the ARCADIS Geraghty & Miller field hydrogeologist for cleanliness prior to use in this field program. All equipment and tools will be decontaminated between monitoring well locations using methods described in Section 7.3 (Decontamination) of the 1998 Work Plan. All water generated from decontamination will be containerized transported, and disposed of on-site (see Disposal of Waste, below).

All non-dedicated well evacuation and sampling equipment (probes, pumps, etc.) will be decontaminated between well locations using methods described in Section 7.3 (Decontamination) of the 1998 Work Plan. All water generated during decontamination will be containerized , transported, and disposed of on-site (see Disposal of Waste, below).

Disposal of Waste

All cuttings and fluid waste generated during the off-site well drilling program will be transported and staged at the Lockheed Martin facility at the end of each day. All cuttings, fluids, and development water generated from monitoring well drilling, installation, and development will be containerized in Department of Transportation (DOT) 55-gallon capacity drums, lined roll-offs, or tanker trucks and staged by the monitoring well drilling contractor at an on-site area designated by Lockheed Martin Corporation. Solid wastes will be stored in secured areas in open-top drums, or lined roll-offs; liquid wastes will be stored in drums fitted with bung holes, tanker trucks, or baker tanks awaiting results of waste characterization samples..

After the monitoring well development effort is complete, ARCADIS Geraghty & Miller will immediately coordinate waste disposal with the drilling contractor's waste transportation and disposal subcontractor. ARCADIS Geraghty & Miller will collect representative samples of the solid and liquid waste generated from the drilling and installation effort and coordinate submittal of samples for laboratory analysis of waste classification parameters, as required by the waste disposal facility.

All solids present in water generated from decontamination and monitoring well drilling and development will be allowed to settle. The supernatant fluid will then be pumped into the on-site operating groundwater Interim Remedial Measure (IRM) system for treatment. The remaining solids will be characterized and disposed of off-site with the other solid waste. All purge water generated during the groundwater sampling event will be containerized in drums, carboys, or other suitable containers. Following completion of groundwater sampling, each field crew will transport the purge water on-site and transfer the water via centrifugal pump to the dedicated container and discharge the water to the OU-1 groundwater IRM.

Site Maintenance and Restoration

Prior to drilling, noise and traffic barricades will be erected. During drilling and sampling operations, the work area shall be kept clean as practicable. Prior to demobilization from a monitoring well cluster location, the drilling contractor will restore damaged areas of the site to original condition which includes, at a minimum, leveling of any trenches and/or pits, disposal of all materials, and restoration of the site to its original condition, to the extent possible (i.e., including reseeding grass areas, repairing asphalt and/or cement areas). The drilling area will be secured with construction fencing to the end of each day.

Health and Safety

The site-specific Health and Safety Plan (HASP) has been prepared applicable to the field activities identified in this Supplemental Work Plan, and is provided in Appendix B.

Project Reporting

Field reporting and record keeping will be in accordance with Section 7.0 (Quality Assurance/Quality Control Plan) of the 1998 Work Plan. Upon completion of the field effort, reduction of the field records, receipt, reduction, and QA/QC check of the analytical data, the methods and results will be incorporated into the appropriate sections of the OU-2 RI Report.

Project Schedule

The field work tasks and report deliverable project schedule are presented on Figure 4. Implementation of the field program is dependent on coordination with the NYSDEC, property owners, and Lockheed Martin Corporation to secure access agreements to proposed monitoring well drilling locations.

Please contact us if you have any questions or comments.

Respectfully Submitted,

ARCADIS Geraghty & Miller, Inc.

Carlo San Giovanni
Principal Scientist/Project Manager

Thomas Lobasso
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Attachments

Copies:

Gene Matsushita, Lockheed Martin Corporation
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Tables

Table 1. Monitoring Well Construction Specifications, Supplemental Operable Unit 2 Remedial Investigation Work Plan, Lockheed Martin Corporation, Great Neck, New York.

Well Designation	Drilling Method	Geophysical Log	Monitoring Well Diameter (inches)	Well Casing/Screen Material	Screen Slot Size (inches)	Total Depth (ft bls)	Estimated Land Surface Elevation (ft msl) [1]	Screened Interval (ft bls)	Estimated Elevation of Screened Interval (ft msl)	Gravel Pack Interval (ft bls)	Fine Sand Interval (ft bls)	Bentonite Slurry Grout Interval (ft bls)
37-GL	H.S.A	Gamma [2]	4	Schedule 80 PVC	0.020	155	170	135 - 155	(+35) - (+15)	130 - 155	127 - 130	0 - 127
37-MI	MR	--	4	Schedule 80 PVC	0.020	235	170	215 - 235	(-45) - (-65)	195 - 235	190 - 195	0 - 195
37-ML	MR	Gamma/Electric	4	Schedule 80 PVC	0.020	370	170	350 - 370	(-180) - (-200)	320 - 270	310 - 320	0 - 310
38-GL	H.S.A	Gamma [2]	4	Schedule 80 PVC	0.020	165	180	145 - 165	(+35) - (+15)	140 - 165	137 - 140	0 - 137
38-MI	MR	--	4	Schedule 80 PVC	0.020	235	180	215 - 235	(-45) - (-65)	195 - 235	190 - 195	0 - 190
38-ML	MR	Gamma/Electric	4	Schedule 80 PVC	0.020	380	180	360 - 380	(-180) - (-200)	330 - 380	320 - 330	0 - 320
39-GL	H.S.A	Gamma [2]	4	Schedule 80 PVC	0.020	135	150	115 - 135	(+35) - (+15)	110 - 135	107 - 110	0 - 107
39-MI	MR	--	4	Schedule 80 PVC	0.020	205	150	185 - 205	(-45) - (-65)	165 - 205	160 - 165	0 - 160
39-ML	MR	Gamma/Electric	4	Schedule 80 PVC	0.020	350	150	330 - 350	(-180) - (-200)	300 - 350	290 - 300	0 - 290

[1] Land surface elevations obtained from USGS 7.5-minute topographic map of the Lynbrook quadrangle

[2] If the shallow well is drilled prior to completion of the deep well borehole, a gamma log will be run to determine borehole lithology in the shallow zone.

ft bls feet below land surface
ft msl feet relative to mean sea level
-- No geophysical log will be run.
H.S.A Hollow-Stem Auger
MR Mud Rotary
PVC Polyvinyl chloride

Table 2. Wells in the Vicinity of Lockheed Martin Corporation, Great Neck, New York.

Well Designation	Date Installed	Total Depth	Well Diameter	Screened Interval	Measuring Point Elevation (feet above msl)	Screened Interval below msl
Monitoring Wells						
1GU	May-88	115	2 inch	105 to 115	143.77	39 to 29
1GL	May-88	147	4 inch	127 to 147	144.41	17 to -3
1MI	May-88	255	4 inch	235 to 255	144.39	-91 to -111
1MI/L	May-89	342	4 inch	322 to 342	144.55	-177 to -197
1ML	May-91	395	4 inch	390 to 400	144.89	-245 to -255
2GL	May-88	147	4 inch	127 to 147	128.35	1 to -19
2MU	Jul-91	185	4 inch	175 to 185	125.90	-49 to -59
2MI	Apr-89	250	4 inch	230 to 250	128.57	-101 to -121
2ML	Aug-94	447	4 inch	397 to 407	125.69	-271 to -281
3GL	May-88	149	4 inch	129 to 149	139.50	11 to -10
3ML	Jul-94	350	4 inch	325 to 335	137.02	-188 to -198
4GL	May-88	150	4 inch	130 to 150	144.81	15 to -5
4MI	Mar-89	250	4 inch	230 to 250	145.10	-85 to -105
5GU	Jan-92	95	4 inch	74 to 94	131.32	57 to 37
5GL	Feb-89	130	4 inch	110 to 130	130.32	20 to 0
5MI	Feb-89	250	4 inch	239 to 250	130.31	-109 to -120
5ML	Jul-94	350	4 inch	325 to 335	129.17	-196 to -206
6GL	Feb-89	125	4 inch	105 to 125	128.30	23 to 3
6MI	Jul-91	240	4 inch	215 to 235	128.80	-86 to -106
7GL	Mar-89	150	4 inch	130 to 150	149.76	20 to 0
7ML	Jun-94	355	4 inch	323 to 333	148.98	-174 to -184
8GU	Apr-89	90	4 inch	80 to 90	120.42	40 to 30
8GL	Apr-89	150	4 inch	130 to 150	120.32	-10 to -30
8ML	Jun-94	355	4 inch	328 to 338	126.94	-201 to -211
9GL	Apr-89	155	4 inch	135 to 155	126.94	-8 to -28
10GL	Apr-89	132	4 inch	112 to 132	126.03	14 to -6
11GL	May-89	140	4 inch	120 to 140	129.02	9 to -11
11MI	May-89	250	4 inch	230 to 250	129.39	-101 to -121
12MI	May-91	253	4 inch	243 to 253	133.61	-109 to -119
12ML	May-91	393	4 inch	383 to 393	133.85	-249 to -259
13ML	Apr-96	275	4 inch	255 to 275	158.97	-96 to -116
14MI	Apr-96	250	4 inch	220 to 250	160.52	-59 to -89
15GL	Aug-94	170	4 inch	150 to 160	132.57	-17 to -27
15ML	Aug-94	340	4 inch	328 to 338	132.63	-195 to -205
16GL	Apr-96	222	4 inch	202 to 222	227.08	25 to 5
16ML	Aug-95	326	4 inch	316 to 326	227.11	-89 to -99
17GL	Aug-94	170	4 inch	155 to 165	138.99	-16 to -26
17ML	Aug-94	428	4 inch	390 to 400	138.64	-251 to -261
18GL	Sep-94	170	4 inch	160 to 170	150.24	-10 to -20
18ML	Sep-94	345	4 inch	324 to 334	149.55	-174 to -184
19GU	Jan-92	99	2 inch	78 to 98	137.20	59 to 39
19MI	Jan-92	248	4 inch	229 to 239	137.22	-92 to -102
20GU	Jan-92	93		73 to 93	NO ACCESS - LILCO	
21GU	Jan-92	98	4 inch	78 to 98	132.85	55 to 35
22GL	Sep-94	168	4 inch	158 to 168	135.53	-22 to -32
22ML	Aug-94	340	4 inch	315 to 325	135.16	-180 to -190

See footnotes on last page

Table 2. Wells in the Vicinity of Lockheed Martin Corporation, Great Neck, New York.

Well Designation	Date Installed	Total Depth	Well Diameter	Screened Interval	Measuring Point Elevation (feet above msl)	Screened Interval below msl
Monitoring Wells (continued0						
23GL	Aug-94	150	2 inch	140 to 150	139.82	0 to -10
23MI	Jun-94	215	2 inch	202 to 212	138.88	-63 to -73
24GL	May-94	150	2 inch	139 to 149	139.89	1 to -9
24MI	May-94	220	2 inch	200 to 210	139.97	-60 to -70
25GL	May-94	170	2 inch	159 to 169	134.66	-24 to -34
25MI	May-94	220	2 inch	200 to 210	135.75	-64 to -74
26GL	May-94	184	2 inch	174 to 184	130.46	-44 to -54
26MI	May-94	240	2 inch	220 to 230	130.79	-89 to -99
27GL	Jun-94	180	2 inch	170 to 180	121.75	-48 to -58
27MI	Jun-94	230	2 inch	217 to 227	122.24	-95 to -105
28GL	Jun-94	150	2 inch	140 to 150	136.21	-4 to -14
28MI	Jun-94	250	2 inch	222 to 232	136.57	-85 to -95
29GL	Jul-94	170	2 inch	145 to 155	143.37	-2 to -12
29MI	Jul-94	250	2 inch	207 to 217	143.48	-64 to -74
30GL	Sep-98	210	4 inch	190 to 210	138.48	-52 to -72
30MI	Aug-98	280	4 inch	260 to 280	138.67	-121 to -141
30ML	Aug-98	380	4 inch	360 to 380	138.50	-222 to -242
31GL	Oct-98	200	4 inch	180 to 200	123.86	-56 to -76
31MI	Oct-98	255	4 inch	235 to 255	124.39	-111 to -131
31ML	Oct-98	355	4 inch	335 to 355	124.61	-210 to -230
32GL	Sep-98	240	4 inch	220 to 240	200.71	-19 to -39
32MI	Sep-98	330	4 inch	310 to 330	202.16	-108 to -128
32ML	Sep-98	412	4 inch	392 to 412	202.59	-189 to -209
33GL	Aug-98	252	4 inch	232 to 252	256.16	24 to 4
33MI	Aug-98	310	4 inch	290 to 310	256.45	-34 to -54
33ML	Aug-98	425	4 inch	405 to 425	256.37	-149 to -169
35GL	Aug-98	135	2 inch	115 to 135	129.21	14 to -6
36GL	Aug-98	135	2 inch	115 to 135	134.41	19 to -1
37GL	--	--	--	105 to 115*	--	-- to --
37MI	--	--	--	240 to 250*	--	-- to --
37ML	--	--	--	390 to 400*	--	-- to --
38GL	--	--	--	105 to 115*	--	-- to --
38MI	--	--	--	240 to 250*	--	-- to --
38ML	--	--	--	390 to 400*	--	-- to --
39GL	--	--	--	105 to 115*	--	-- to --
39MI	--	--	--	240 to 250*	--	-- to --
39ML	--	--	--	390 to 400*	--	-- to --
On-Site Recovery, Extraction, and Diffusion Wells						
RW-1	Sep-91	196	--	140 to 160	144.82	5 to -15
				171 to 196		-26 to -51
RW-2	Jul-91	215	--	180 to 210	128.23	-52 to -82
EW-1	Aug-42	235	--	199 to 229	--	-- to --
EW-2	Jul-54	260	--	225 to 255	--	-- to --
EW-3	Mar-42	256	--	220 to 250	--	-- to --
EW-4	Oct-42	107	--	89 to 104	--	-- to --

See footnotes on last page

Table 2. Wells in the Vicinity of Lockheed Martin Corporation, Great Neck, New York.

Well Designation	Date Installed	Total Depth	Well Diameter	Screened Interval	Measuring Point Elevation (feet above msl)	Screened Interval below msl
On-Site Recovery, Extraction, and Diffusion Wells (continued)						
DW-5	Jul-42	267	--	210 to 260	--	--
DW-6	Sep-42	259	--	209 to 259	--	--
DW-7	Jun-54	245	--	199 to 239	--	--
DW-8	Jun-42	195	--	195 to 190	--	--
DW-9	Oct-51	108	--	108 to 108	--	--
Offsite Monitoring, Municipal, Domestic and Industrial Wells						
N14	--	550	--	--	--	--
N15	--	--	--	--	--	--
N1102	--	--	--	--	--	--
N1618	--	550	--	--	--	--
N1802	--	691	--	--	--	--
N1958	--	722	--	--	--	--
N2576	--	--	--	--	--	--
N3672	--	--	--	--	--	--
N3673	--	--	--	--	--	--
N3905	--	254	--	--	--	--
N4243	--	255	--	--	--	--
N4390	--	296	--	--	--	--
N5535	--	--	--	--	--	--
N5603	--	--	--	--	--	--
N5710	--	385	--	--	--	--
N6073	--	448	--	--	--	--
N7445	--	--	--	--	--	--
N7512	--	--	--	--	--	--
N7560	--	--	--	--	--	--
N8038	--	--	--	--	--	--
N8358	--	--	--	--	--	--
N8499	--	--	--	--	--	--
N8585	--	--	--	--	--	--
N8821	--	--	--	--	--	--
N8970	--	--	--	--	--	--
N9188	--	--	--	--	--	--
N9948	--	--	--	--	--	--
N9949	--	--	--	--	--	--
N9982	--	--	--	--	--	--
N9983	--	--	--	--	--	--
N10059	--	--	--	--	--	--
N10060	--	--	--	--	--	--
N10252	--	--	--	--	--	--
N10290	--	--	--	--	--	--
N11659	--	--	--	--	--	--

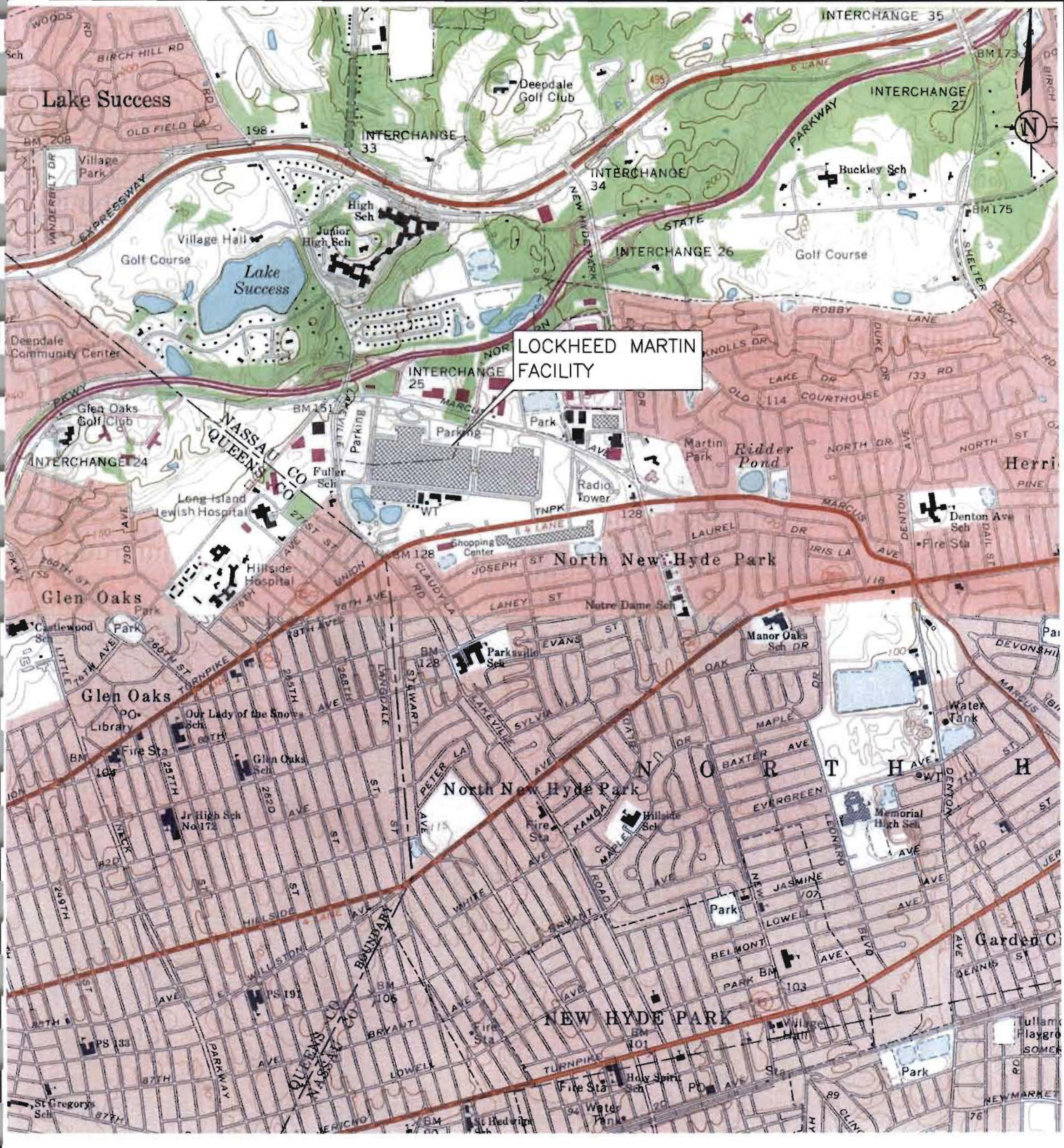
Notes:

* Proposed interval.

msl Mean sea level.

-- Information not available or to be determined.

Figures



SOURCE:
U.S.G.S. 7.5 MINUTE QUADRANGLE, LYNBROOK, N.Y. AND SEA CLIFF, N.Y., REVISED 1979.

SCALE: 1"=2000'-0"

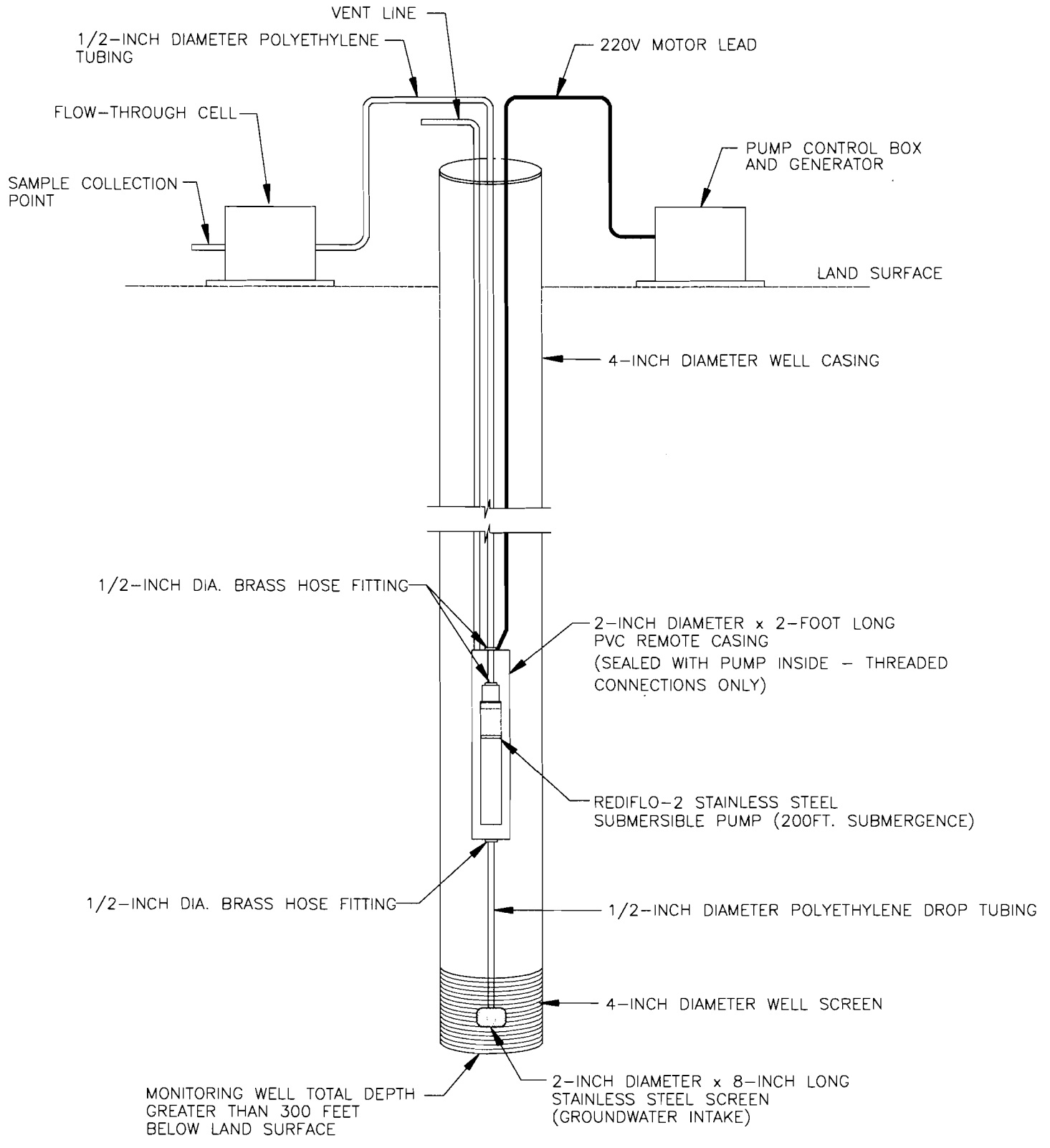
SUPPLEMENTAL OPERABLE UNIT 2
REMEDIAL INVESTIGATION WORK PLAN

NO.	DATE	REVISION DESCRIPTION	BY CKD

ARCADIS GERAGHTY & MILLER

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
A.G.	3/30/99		
		LEAD DESIGN PROF.	CHECKED D. STERN
SITE MAP		PROJECT NUMBER	DRAWING NUMBER
LOCKHEED MARTIN CORPORATION GREAT NECK, NEW YORK		NY001228.000A	1

For Figure 2, see Project Manager.



NOT TO SCALE

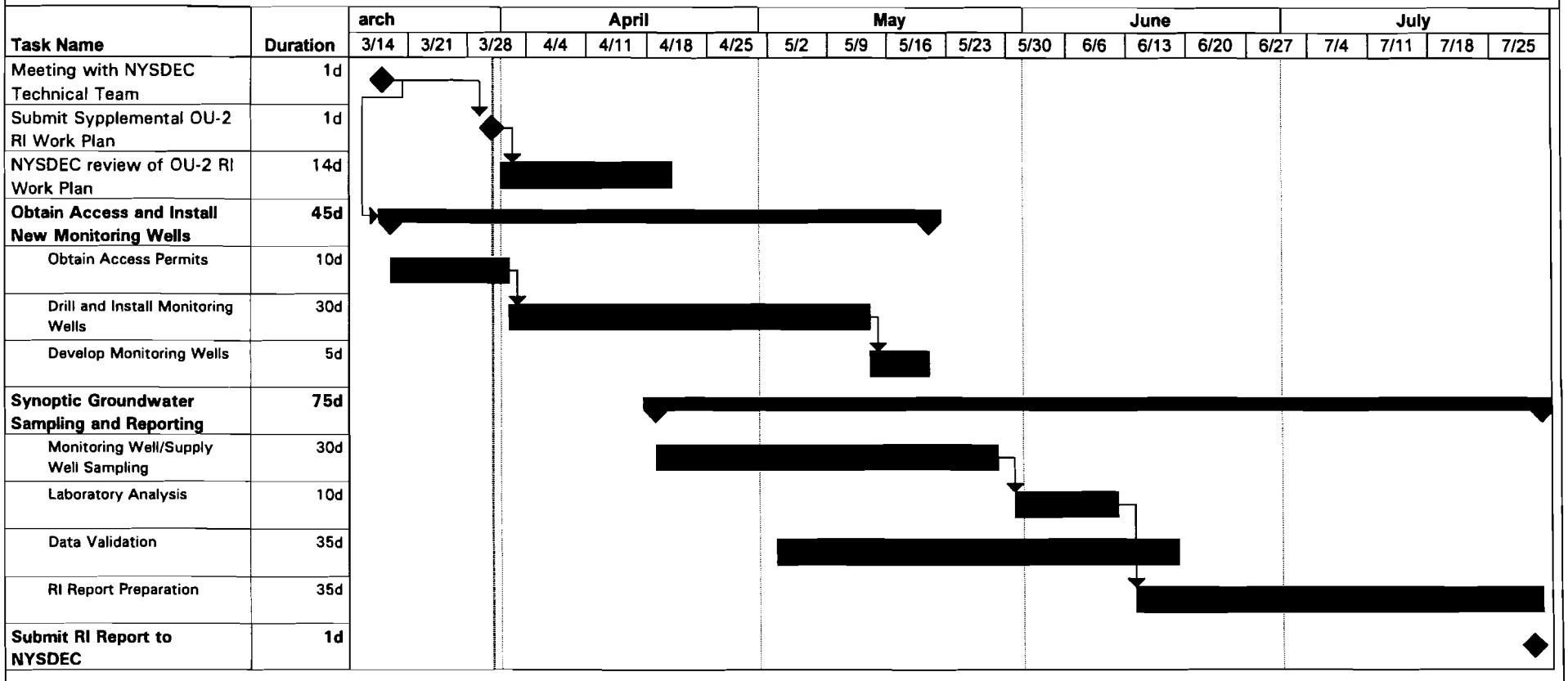
SUPPLEMENTAL OPERABLE UNIT 2
REMEDIAL INVESTIGATION WORK PLAN

NO.	DATE	REVISION DESCRIPTION	BY CKD

ARCADIS GERAGHTY & MILLER

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
A.G.	3/30/99		
CONCEPTUAL SCHEMATIC OF SUBMERSIBLE PUMP AND REMOTE CASING ASSEMBLY LOCKHEED MARTIN CORPORATION GREAT NECK, NEW YORK		LEAD DESIGN PROF.	CHECKED D. STERN
		PROJECT NUMBER	DRAWING NUMBER
		NY001228.000A	3

FIGURE 4. Operable Unit 2 Supplemental Remedial Investigation Project Schedule, Lockheed Martin Corporation, Great Neck, New York.



\\ny1-srv1\data\aproject\lockheed Martin\OU-2 RI Report\Reports\Supplemental Workplan Schedule

Appendix A

Addendum to OU-2 Quality Assurance Project Plan

Addendum to the OU-2 Remedial Investigation/Feasibility Study Work Plan Quality Assurance Project Plan (QAPP)

This addendum to the Quality Assurance Project Plan (QAPP) was prepared to clarify procedures described in Section 7.0 (Quality Assurance/Quality Control Plan) of the Operable Unit 2 (OU-2) Remedial Investigation/Feasibility Study (RI/FS) Work Plan (1998 Work Plan) (H2M Group 1998) prepared on behalf of the Lockheed Martin Corporation. Although no specific section of the OU-2 Work Plan is designated as the QAPP, based on review of the OU-2 RI/FS Work Plan, information typically placed in a QAPP is provided in the OU-2 Work Plan. For the purposes of the Supplemental RI Work Plan, the following QA/QC procedures have been revised.

- Section 7.1 (Field QA/QC) requires that one blind duplicate sample per 20 groundwater samples or one per day (whichever is greater) will be used. This quantity of duplicates is excessive. For the purposes of this Supplemental RI Work Plan, one blind duplicate sample per 20 groundwater samples or one per week (whichever is greater) will be collected.

- Section 7.1 (Field QA/QC) requires that one Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample set will be collected for every 20 samples per matrix. For the purposes of this Supplemental Work Plan, one MS/MSD sample set will be collected for every 20 samples per matrix or one per week (whichever is greater).

- The following statement has been added to supplement existing text in Section 7.8 (Data Validation): Validation of the organic data was performed following the quality assurance/quality control (QA/QC) criteria set forth in the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP), October 1995; the United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Data Review, September 1993.

Appendix B

Health and Safety Plan

ARCADIS GERAGHTY & MILLER

Appendix B
Health & Safety Plan

Supplemental Operable Unit 2
Remedial Investigation
Work Plan

PREPARED FOR

Lockheed Martin Corporation

ARCADIS GERAGHTY & MILLER

Carlo San Giovanni
Principal Scientist/Project Manager

Tom C. Eng
Principal Engineer/Corporate Health & Safety Officer

Appendix B
Health & Safety Plan

Supplemental Operable Unit 2
Remedial Investigation
Work Plan

Prepared for:
Lockheed Martin Corporation

Prepared by:
ARCADIS Geraghty & Miller, Inc.
88 Duryea Road
Melville
New York 11747
Tel 516 249 7600
Fax 516 249 7610

Our Ref.:
NY00122800OA

Date:
31 March 1999

Table of Contents

Table of Contents

1. Introduction

ARCADIS Geraghty & Miller, Inc. has been retained by Lockheed Martin Corporation to conduct the groundwater investigation at the Great Neck, Long Island facility. This Health and Safety Plan (HASP) has been developed to address the potential physical and chemical hazards that our workers may face while performing the planned field activities. This HASP establishes procedures to minimize worker's exposures through personal protective equipment and safe work practices. This HASP has been developed to meet the requirements of the Occupational Safety and Health Administration (OSHA) regulations, Title 29, Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120), "Hazardous Waste Operations and Emergency Response." It is intended for the protection of our workers. Anyone else, such as subcontractors, client, and visitors may review our HASP and follow its procedures if they wish.

2. Responsibilities

ARCADIS Geraghty & Miller's on-site geologist will be designated as the Site Safety Officer (SSO). The SSO will be responsible for implementing the procedures and safe work practices established in this HASP. In the event that the SSO must leave the site while the work is in progress, an alternate SSO will be designated to ensure that the HASP will continue to be followed. The SSO will report all health and safety matters to the project manager, Carlo San Giovanni, who has responsibility for overseeing the planned activities. Tom Eng, health and safety manager, will be available on an as needed basis.

3. Site Description

The Great Neck Site was a former manufacturing facility of mainly electronic components for military and commercial applications. The 94-acre site consist of several large manufacturing buildings. The perimeter of the site is fenced limiting access by unauthorized personnel. The site is listed by the New York State Department of Environmental Conservation (NYSDEC) as a Class 2, Inactive Hazardous Waste site (Site No.130045). 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, New York 11020. The site is bounded by Marcus Avenue to the north, Union Turnpike to the south, Lakeville Road to the west and Triad Business Park to the east. A site location map is presented in Figure 1.1.

The subject area has been separated into two Operable Units (OUs) which represent portions of the site and/or surrounding areas 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 1 (OU-1) consists of the on-site project area owned by Lockheed Martin. Operable Unit 2 (OU-2) includes the off-site areas immediately surrounding the site.

4. Planned Field Activities

The planned field activities associated with this groundwater investigation consist of the installation of groundwater monitoring wells and the collection of groundwater samples to determine groundwater quality.

5. Hazard Evaluation

The potential hazards, physical and chemical, associated with the planned field activities for this site have been evaluated. Existing site information was used in this evaluation process.

The physical hazards associated with the planned field activities include the potential for being struck by/against equipment; being splashed with potentially contaminated fluids; and slipping/falling due to wet or uneven surfaces.

The chemical hazards associated with the planned field activities include the potential exposure to volatile organic compounds (VOCs) such as tetrachloroethylene (PCE), trichloroethylene (TCE), 1,2-dichloroethylene (1,2 DCE), 1,1,1-trichloroethane (1,1,1 TCA), vinyl chloride and freon 113. Based upon this information, the following exposure pathways have been identified to minimize potential worker's exposure:

- Inhalation of vapors and gases.
- Direct skin and eye contact.
- Accidental ingestion.

6. Air Monitoring

Air monitoring will be conducted at this site during all planned field activities to ensure that the workers are appropriately protected from the potential physical and chemical

hazards. An intrinsically safe photo ionization detector (PID) instrument will be used. This instrument is designed to measure trace quantities of VOCs in air and has a parts per million (ppm) sensitivity range. This instrument will be calibrated each morning, before field use, and calibration records will be kept. In order to identify specific compounds, colorimetric tubes for vinyl chloride will be used. Colorimetric tubes are also designed to measure specific compounds in the ppm range.

7. Action Levels

The following action level procedure has been established for all planned field activities to evaluate whether actual field conditions will require an upgrade in the level of personal protection. Prior to the start of each day's activities and after the gas mitigation measures have been initiated, background readings in the immediate work area will be taken using the PID instrument. Should background readings meet or exceed 1 ppm for a sustained period of 10 minutes, colorimetric tubes for vinyl chloride will be drawn to determine it's presence and concentration. Should vinyl chloride be present, the action levels described below will be followed. During all field activities, air monitoring using the PID instrument will be conducted. An action level of 1 ppm needle deflection for a sustained period of 10 minutes in the worker's breathing zone has been established based on the potential presence vinyl chloride. If the action level is exceeded, a second step, using colorimetric tubes for vinyl chloride, will be taken to confirm whether vinyl chloride concentrations meet or exceed 1 ppm in the worker's breathing zone. If the action level is exceeded, work will be discontinued, the work area will be permitted to vent and the workers moved to an area up wind. Work will not resume until the concentrations fall below the action level. If the concentrations of vinyl chloride do not fall below the action level after 10 minutes, the work will resume with the level of protection upgraded to Level C using a full face air purifying respirator equipped with an organic vapor cartridge. Once in Level C, colorimetric tubes will be drawn every hour to monitor the presence of vinyl chloride. When this monitoring indicates that the concentration is below the action level for the compound, then downgrading to Level D is possible. If the vinyl chloride concentration meets or exceeds 10 ppm, work will be discontinued, the work area will be permitted to vent, and the workers will be moved to an area upwind until the vinyl chloride concentration falls below 10 ppm. If the vinyl chloride concentration does not fall below 10 ppm after 10 minutes, the work will resume with the level of protection upgraded to Level B. Should PID instrument readings meet or exceed 25 ppm for a sustained period of 10 minutes, and it has been determined that vinyl chloride is not present, work will be discontinued, workers will be moved upwind, and the work area will be permitted to vent until the PID instrument readings are less than 25 ppm. If

after 10 minutes of venting, the PID instrument readings are still 25 ppm or greater, work can resume with workers upgraded to Level C protection. Should PID instrument readings meet or exceed 1,000 ppm for a sustained period of 10 minutes, work will be discontinued, workers will be moved upwind, and the work area will be permitted to vent.

8. Levels Of Protection

Based upon the hazard evaluation results, all tasks will initially be performed in Level D protection. In the event that the established action levels are exceeded, the level of protection may be upgraded to Level C. The following is a description of the personal protective equipment required for each level:

Level D

- Hard hat
- Disposable coveralls
- Safety glasses, goggles, or faceshield
- Steel-toe and shank, chemical-resistant boots
- Chemical-resistant gloves
- Hearing protection, Noise Reduction Rating (NRR) of 35 decibels

Level C

- Safety glasses, goggles, or faceshield
- Hard hat
- Disposable coveralls
- Full face air purifying respirator equipped with organic vapor cartridges
- Steel-toe and shank, chemical-resistant boots
- Chemical-resistant gloves

- Hearing protection, NRR of 35 decibels

9. Safe Work Practices

- All ARCADIS Geraghty & Miller site personnel will be participants of the company's health and safety program. This includes 40 hours of initial training and three days of supervised field work, annual 8 hour refresher training and 8 hour manager and supervisor training.

- All ARCADIS Geraghty & Miller site personnel are participants of the company's medical surveillance program.

- A copy of the HASP will be available for reference at the site during the planned field activities. Site visitors will be required to sign the Site Visitors Log (Appendix A).

- Dust suppression, using a water spray, will be used when needed to reduce airborne particulates during the field activities.

- A pre-entry, tailgate safety meeting will be conducted and recorded on the form in Appendix B prior to the start of each day's activities to discuss the associated hazards.

- All underground utilities and structures will be marked out and cleared before any ground intrusive work begins. This will be recorded on the form provided in Appendix C.

- The SSO will inform all subcontractors of the potential hazards associated with the site and the planned field activities. A copy of the HASP will be made available for their review.

- No eating, drinking, and smoking will be permitted in the work and support zones.

- No sources of ignition, such as matches or lighters will be permitted in the work and support zones.

- The buddy system will be used in all work areas.

- During hazardous weather conditions, such as lightning and thunder storms, work will cease immediately.

10. Site Control

Entrance to the work site is limited to authorized personnel only. The SSO will determine and identify the following areas of the work site. These areas will be divided into three zones, designated as the exclusion zone, the contamination reduction zone (CRZ), and the support zone. The SSO will also specify the equipment, operations, and personnel to occupy these controlled areas.

1. Exclusion Zone (Zone 1)

The exclusion zone is the zone where contamination exists or could occur. All personnel working in an exclusion zone will wear the prescribed level of protection. An entry and exit check point will be visually defined at the periphery of the exclusion zone to regulate the flow of personnel and equipment into and out of the zone. Personnel who have not met the medical monitoring and training criteria set forth in this HASP are not permitted to enter the exclusion and contamination reduction zones.

An exclusion zone will be established around the work areas in which encountering hazardous substances are probable. When established, this zone will be of sufficient size to contain all work activities and resultant waste production. The exclusion zone perimeter will be defined with cones, barricades, or barricade tape.

2. Contamination Reduction Zone (Zone 2)

The area between the exclusion zone and the support zone is the CRZ. This zone provides a transition between a contaminated area (exclusion zone) and a support zone. The CRZ serves as a buffer to further reduce the possibility of the clean support zone from becoming contaminated. It provides additional assurance that the physical transfer of contaminating substances on personnel, on equipment, or in the air is limited through a combination of decontamination, distance between exclusion and support zones, air dilution, zone restrictions, and work functions. Decontamination of personnel and sampling equipment will be performed in the contamination reduction corridor (CRC), which will be situated within the CRZ. The CRC will be established as the entry and exit points to the defined work areas.

3. Support Zone (Zone 3)

This space is outside the zone of contamination. The support zone must be marked and protected against contamination from the work area. This zone serves the following functions:

- An entry for personnel, material, and equipment.
- An exit for decontaminated personnel, materials, and equipment.
- An area for rest breaks.

Waste materials resulting from work activities (such as contaminated protective clothing) will be containerized within the exclusion zone and properly disposed of. Only authorized visitors and investigative team members will be allowed within work areas during the field work. Site security will be performed by the SSO or his designee.

11. Decontamination

All personnel performing work tasks in the work areas must pass through the CRZ decontamination procedure, regardless of the work task or protection used. All equipment and tools used within the work area will also undergo decontamination.

In Level D protection, personnel decontamination will consist of removing the disposable coveralls, if one was worn, followed by washing the outer boots and gloves with a decontamination solution, consisting of detergent and water. Gloves and boots will then be rinsed with clean water.

In Level C protection, the disposable coveralls, boots and gloves will be washed and rinsed in the same manner as previously described prior to removal. The respirator face piece will then be removed and the respirator will be placed in a plastic-lined container for decontamination.

Equipment used in the work area (tools, monitoring equipment, radios, clipboards, etc.) will be deposited on plastic drop cloths or in different containers with plastic liners. Tools and devices will be washed/wiped in a detergent solution and rinsed with clean water, then stored or serviced for reuse.

12. Emergency Plan

Verbal communications may be difficult at times due to personal protective equipment and noise. A universal set of hand signals will then be used. They are as follows:

Hand gripping throat:	Can't breath
Grip partner's wrist or	Leave work area immediately
place hands around waist:	
Hand on top of head:	Need assistance
Thumbs up:	Okay, I'm all right
Thumbs down:	No, Negative

13. Injury Reporting

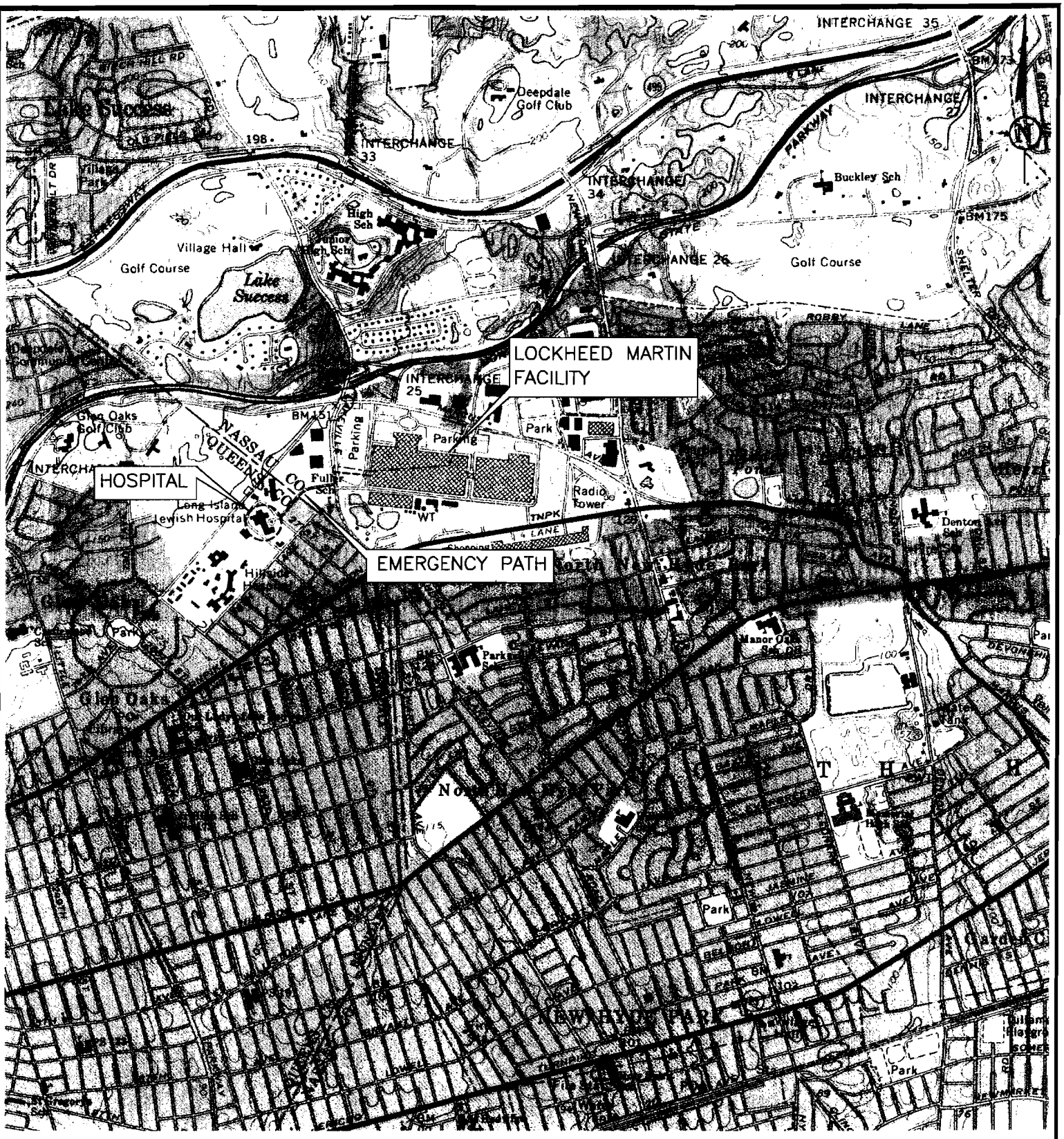
All job-related injuries and illnesses will be reported to the SSO. If medical attention is needed, the injured worker will be decontaminated, if possible, prior to leaving the site. The SSO will investigate the cause of the accident and corrective measures will be taken before the work can resume. It will be the responsibility of the SSO to complete the accident reporting form, OSHA 101, included as Appendix D for all injuries. The completed OSHA 101 should be forwarded to the office health and safety manager within six days for recording into the OSHA 200 log. In the event of a fatality or 3 or more workers hospitalized as a result of a single incident, the SSO will contact the office health and safety manager immediately for OSHA reporting purposes.

14. Emergency Telephone Numbers

Village of Lake Success Police	-	911 or (516) 482-4600
Lake Success Fire Department	-	911 or (516) 466-4412
Manhasset-Lakeville First Aid Ambulance Squad	-	911 or (516) 466-4411
Long Island Jewish Hospital	-	(718) 470-7000

15. Directions To The Hospital

Long Island Jewish Hospital is adjacent to the site. All medical emergencies should be directed to the hospital for treatment. Directions to the hospital are illustrated on Figure 1.1.



SOURCE:

U.S.G.S. 7.5 MINUTE QUADRANGLE, LYNBROOK, N.Y. AND SEA CLIFF, N.Y., REVISED 1979.

SCALE: 1"=2000'-0"

NO.	DATE	REVISION DESCRIPTION	BY CKD

ARCADIS GERAGHTY & MILLER

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
A.G.	3/30/99		
SITE MAP		LEAD DESIGN PROF.	CHECKED D. STERN
LOCKHEED MARTIN CORPORATION GREAT NECK, NEW YORK		PROJECT NUMBER NY001228.000A	DRAWING NUMBER 1.1

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Appendix A

Site Visitors Log

SITE VISITORS LOG

THE UNDERSIGNED VISITORS REQUIRE ENTRANCE TO THE WORK ZONES AND HAVE THOROUGHLY READ THE HEALTH AND SAFETY PLAN, UNDERSTAND THE POTENTIAL HAZARDS AT THE SITE, AND THE PROCEDURES TO MINIMIZE EXPOSURE TO THESE HAZARDS.

NAME (print)	COMPANY	DATE	SIGNATURE

Appendix B

Tailgate Safety Meeting Form

TAILGATE SAFETY MEETING

Prepared by _____

Client _____ Project _____

Date _____ Project Number _____

Work Location _____

Type of Work to be Done _____

SAFETY TOPICS PRESENTED

Chemical Hazards _____

_____

Physical Hazards/Underground Utilities _____

_____

Protective Clothing/Equipment _____

_____

Special Equipment _____

Emergency Procedures _____

_____

Hospital/Clinic _____ Phone ( )_____

Paramedic Phone ( )_____

Hospital Address _____

Other _____

ATTENDEES

NAME PRINTED	SIGNATURE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting Conducted by _____ _____

Name Printed Signature

Appendix C

Utilities and Structures Checklist

	DRILL RIG SAFETY	
Policy No.	Page	Revision Date:
Approval:		Approval Date:

UTILITIES AND STRUCTURES CHECKLIST

Project: _____ **Prepared by:** _____

Location: _____ **Date:** _____

Instructions. This checklist has to be completed by a G&M staff member as a safety measure to insure that all underground utility lines, other underground structures as well as above-ground power lines are clearly marked out in the area selected for boring or excavation. **DRILLING OR EXCAVATION WORK MAY NOT PROCEED UNTIL LINES ARE MARKED AND THIS CHECKLIST HAS BEEN COMPLETED.** Arrangements for underground utility markouts are best made at the time of the preliminary site visit to allow client and/or utility company sufficient time. Keep completed checklist and maps on site; send copy to Project Manager.

Assignment of Responsibility. Client is responsible for having underground utilities and structures located and marked. Preferably, the utilities themselves should mark out the lines.

Drilling or Excavation Sites. Attach a map of the property showing the proposed drilling or excavation site (or if sites are widely separated, several maps) clearly indicating the area(s) checked for underground utilities or underground structures and the location of above-ground power lines.

Utilities and Structures

Type	Not Present	Present	How Marked[1]
Petroleum products line			
Natural gas line			
Steam line			
Water line			
Sewer line			
Storm drain			
Telephone cable			
Electric power line			
Product tank			
Septic tank/drain field			
Overhead power line			

1) Flags, paint on pavement, wooden stakes, etc.

UTILITIES AND STRUCTURES CHECKLIST
(Continued)

Name and affiliation of person who marked out underground lines or structures

Name	Organization	Phone

Emergency Procedures

Persons at site or facility to contact in case of emergency
1. _____ Phone _____
2. _____ Phone _____
Fire Dept: Phone _____ Ambulance: Phone _____
Utility: Phone _____ Utility: Phone _____
Directions to nearest hospital (describe or attach map).

G:\user\laurao\manual\checklist.doc

Appendix D

Accident Reporting Form, OSHA 101

OSHA FORM 101

SUPPLEMENTARY RECORD OF OCCUPATIONAL INJURIES AND ILLNESSES

EMPLOYER

1. Name _____

2. Mail Address _____
(No. and street) (City or town) (State)

3. Location, if different from mail address _____

INJURED OR ILL EMPLOYEE

4. Name _____ Social Security No. _____
(First name) (Middle name) (Last name)

5. Home Address _____
(No. and street) (City or town) (State)

6. Age _____ 7. Sex: Male_____ Female_____ (Check one)

8. Occupation _____
(Enter regular job title, not the specific activity he was performing at time of injury.)

9. Department _____
(Enter name of department or division in which the injured person is regularly employed, even though he may have been temporarily working in another department at the time of injury.)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____
(No. and street) (City or town) (State)
If accident or exposure occurred on employer's premises, give address of plant or establishment in which it occurred. Do not indicate department or division within the plant or establishment. If accident occurred outside employer's premises at an identifiable address, give that address. If it occurred on a public highway or at any other place which cannot be identified by number and street, please provide place references locating the place of injury as accurately as possible.

11. Was place of accident or exposure on employer's premises? _____ (Yes or No)

12. What was the employee doing when injured? _____
(Be specific. If he was using tools or equipment or handling material,
_____
name them and tell what he was doing with them.)
_____

13. How did the accident occur? _____
(Describe fully the events which resulted in the injury or occupational illness. Tell what happened and how it happened.
_____
Name any objects or substances involved and tell how they were involved. Give full details on all factors which led or contributed to the accident.
_____
Use separate sheet for additional space.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

14. Describe the injury or illness in detail and indicate the part of body affected _____
(e.g: amputation of right index finger at second joint;
_____
fracture of ribs; lead poisoning; dermatitis of left hand, etc.)

15. Name the object or substance which directly injured the employee. (For example, the machine or thing he struck against or which struck him; the vapor or poison he inhaled or swallowed; the chemical or radiation which irritated his skin; or in cases of strains, hernias, etc., the thing he was lifting, pulling, etc.)
_____
_____

16. Date of injury or initial diagnosis of occupational illness _____
(Date)

17. Did employee die? _____ (Yes or No)

OTHER

18. Name and address of physician _____

19. If hospitalized, name and address of hospital _____
_____

Date of report _____ Prepared by _____

Official position _____

2A:OSHA101.FRM