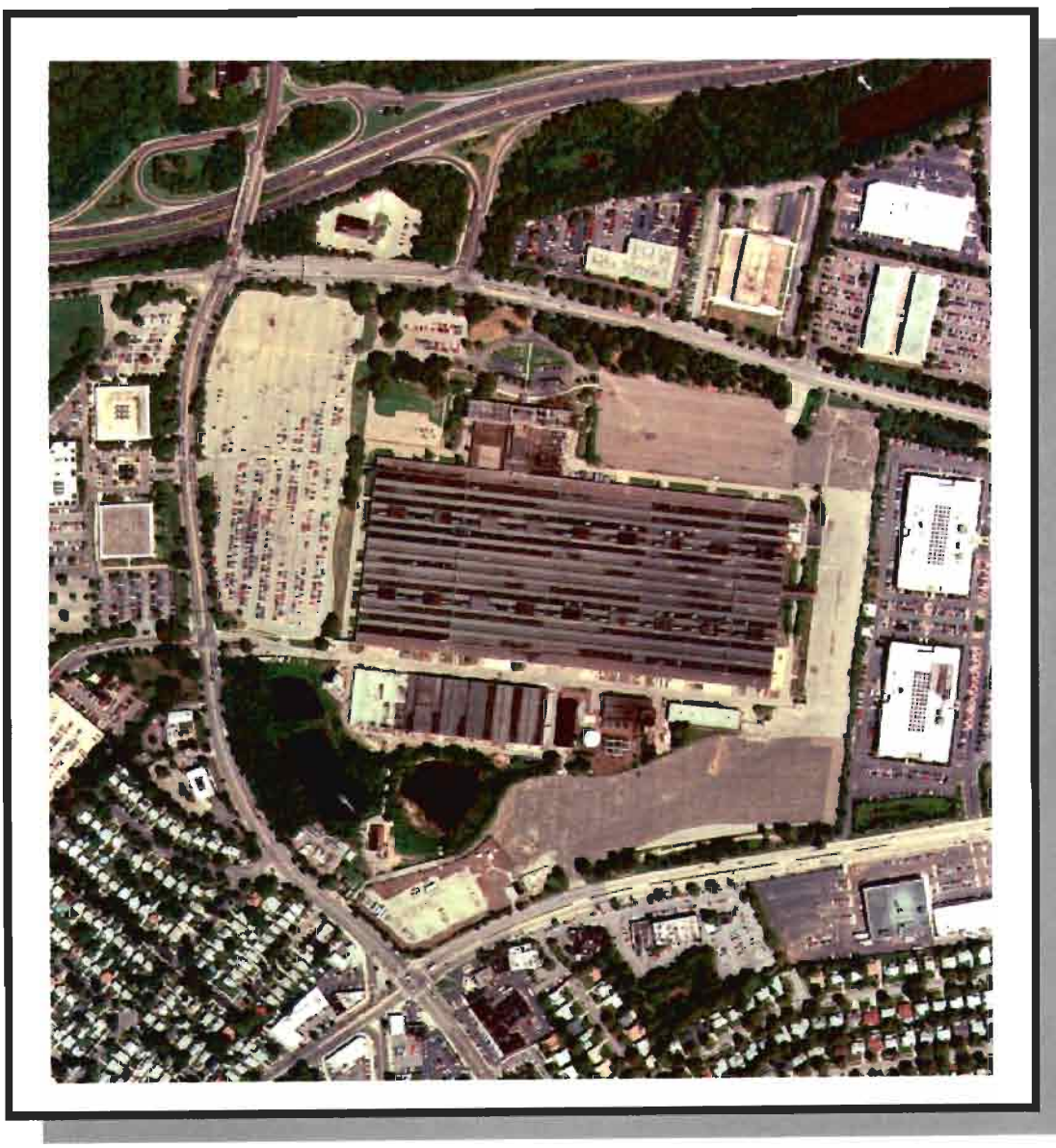
FINAL WORK PLAN

Groundwater Monitoring Well Installation Work Plan
Lockheed Martin Corporation
Great Neck, New York



KHEED MARTIN
K PROGRAM OFFICE

Tetra Tech
Environmental Engineers & Scientists
TC 1768-01/Februrary 9, 1998


LOC
BURBA

Section 3
Groundwater Monitoring Well Installation Program

3.1 TECHNICAL APPROACH

The purpose of the groundwater monitoring well installation is to provide current data on groundwater quality at two specific locations of the site to monitor the selected remedial alternatives as agreed in the OU-1 ROD. The wells will be installed in accordance with requirements of the NYSDEC ROD for the Lockheed Martin site. The details of the proposed field methodologies are presented in Sections 3.1.1 to 3.1.6.

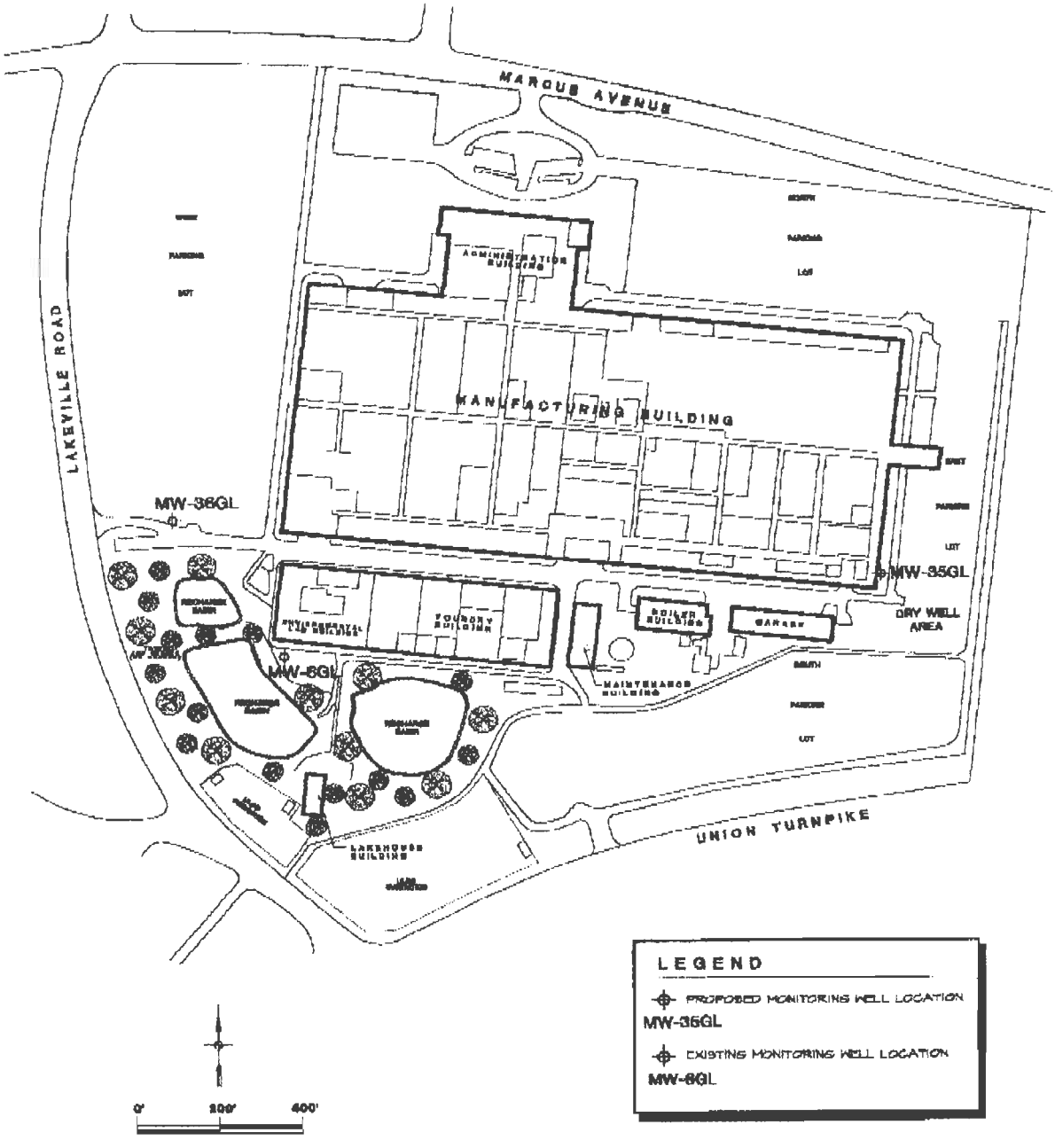
3.1.1 Site Preparation

Prior to initiating the field activities, an underground utility location service will be notified to mark public utility lines. The first 5 feet of each borehole will be hand augered to check for the presence of underground utilities. Utility lines which cross the proposed well locations will be identified and the well locations will be relocated, as necessary. If relocation is required, the wells will be moved to an alternative location within 20 feet of their original location.

3.1.2 Proposed Monitoring Well Locations

Two groundwater monitoring wells will be installed at the Lockheed Martin facility at the locations shown on Figure 3-1. One well (MW-GL35) will be installed immediately downgradient of the Dry Well Area, adjacent to the existing soil vapor extraction (SVE) system.

FIGURE 3-1
PROPOSED MONITORING WELL LOCATIONS



The purpose of MW-35GL is to monitor and evaluate the effectiveness of the SVE system on groundwater quality. A second well (MW-36GL) will be installed downgradient to the northwest of the site recharge basins. The purpose of MW-36GL is to monitor the groundwater quality downgradient of the facility's three storm water retention basins.

3.1.3 Installation Procedures

Well MW-35GL will be installed within 30 feet of the Dry Well Area at the location shown in Figure 3-1 (36 feet north and 9 feet east of the building corner). The well will be installed in the Upper Glacial Aquifer with a 20-foot screen to a terminal depth of approximately 135 feet bgs.

Based on discussions with NYSDEC, MW-36GL will be completed in the Upper Glacial Aquifer with a 20-foot screen to a terminal depth of approximately 135 feet bgs at the location shown in Figure 3-1.

The wells will be installed using a CME-75 drill rig fitted with hollow stem augers, or equivalent, to reach the desired well depth[1]. A split spoon sampler will be used to collect samples at 10-foot intervals in each of the two borings. The samples will be collected for on-site evaluation and logging of the lithology. One sample from the screened interval will be delivered to a Lockheed Martin representative for analysis of total organic carbon.

Soil cuttings generated during the well installation will be stored at a designated staging area. All drill cuttings and associated waste will be characterized and disposed of in accordance with the NYSDEC Final Division Technical and Administrative Guidance Memorandum - Disposal of Drill Cuttings.

[1] Rather than using mud rotary drilling techniques, the hollow stem auger method will be used to prevent the introduction of foreign materials into the borehole or aquifer. Further, use of hollow stem augers will allow the collection of undisturbed samples from the borehole for logging and analysis

3.1.4 Monitoring Well Construction

Each of the wells will be constructed using 4-inch, flush threaded, schedule 80 PVC risers, and 4-inch diameter 0.02-inch slot screen. The screens will not exceed 20 feet in overall length. The annular space around the well screen will be filled with a Morie #2 gravel pack, or equivalent, extending from 1 foot below the bottom of the screen to 2 feet above the top of the screen. Two feet of hydrated bentonite pellets will be placed above the sand pack. The remaining annular space will be tremie-grouted with bentonite cement slurry to approximately 3 feet below grade. Each well will be finished with a water tight locking cap and a protective steel monument set in concrete. The wells will also be surveyed into the existing monitoring well network system.

3.1.5 Well Development

After the wells have been allowed to set for 24 hours, they will be developed. Development consists of two steps: (1) surging; and (2) bailing. Surging consists of operating a submersible pump or equivalent to force water into and out of the screen. The surging settles the sand pack and helps remove silt that may have entered the sand pack or screen during the installation procedure. The well will then be bailed to remove any suspended sediment and other materials that may have been introduced into the well during the installation and surging process. Bailing will continue until approximately four well volumes of water or until an acceptable water quality is achieved.

Specific conductivity, pH, and temperature will be measured during well development until parameters have stabilized. Well development will continue until turbidity measurements below 50 NTUs have been achieved.

The development water will be containerized and transported to the on-site groundwater IRM system for treatment.

The purpose of MW-30GL is to monitor the downgradient groundwater quality to evaluate the effectiveness of the SVE system on the unsaturated soil column above the groundwater table. A second well (MW-31GL) will be installed downgradient of the site recharge basins. The purpose of MW-31GL is to monitor the groundwater quality downgradient of the facility's three storm water retention basins.

3.1.3 Installation Procedures

Well MW-30GL will be installed within 30 feet of the Dry Well Area at the location shown in Figure 3-1. The well will be installed with 10 feet of screen below and 5 feet of screen above the water table to allow for changes in water-table elevation. Based on the site specific depth to water of approximately 85 feet bgs, the total depth of MW-30GL is anticipated to be approximately 95 feet bgs. The actual depth will be determined based upon field conditions.

Based on discussions with NYSDEC, MW-31GL will be completed with a 15-foot screen to a terminal depth of approximately 135 feet bgs at the location shown in Figure 3-1.

The wells will be installed using a CME-75 drill rig fitted with hollow stem augers, or equivalent, to reach the desired well depth[1]. A split spoon sampler will be used to collect samples at 10-foot intervals in each of the two borings. The samples will be collected for on-site evaluation and logging of the lithology. One sample from the screened interval will be delivered to a Lockheed Martin representative for analysis of total organic carbon.

Soil cuttings generated during the well installation will be stored at a designated staging area. All drill cuttings and associated waste will be characterized and disposed of in accordance with the NYSDEC Final Division Technical and Administrative Guidance Memorandum - Disposal of Drill Cuttings.

[1] Rather than using mud rotary drilling techniques, the hollow stem auger method will be used to prevent the introduction of foreign materials into the borehole or aquifer. Further, use of hollow stem augers will allow the collection of undisturbed samples from the borehole for logging and analysis

3.1.4 Monitoring Well Construction

Each of the wells will be constructed using 4-inch, flush threaded, schedule 40 PVC risers, and 4-inch diameter 0.02-inch slot screen. The screens will not exceed 20 feet in overall length. The annular space around the well screen will be filled with a Morie #2 gravel pack, or equivalent, extending from 1 foot below the bottom of the screen to 2 feet above the top of the screen. Two feet of hydrated bentonite pellets will be placed above the sand pack. The remaining annular space will be tremie-grouted with bentonite cement slurry to approximately 3 feet below grade. Each well will be finished with a water tight locking cap and a protective steel monument set in concrete. The wells will also be surveyed into the existing monitoring well network system.

3.1.5 Well Development

After the wells have been allowed to set for 24 hours, they will be developed. Development consists of two steps: (1) surging; and (2) bailing. Surging consists of operating a submersible pump or equivalent to force water into and out of the screen. The surging settles the sand pack and helps remove silt that may have entered the sand pack or screen during the installation procedure. The well will then be bailed to remove any suspended sediment and other materials that may have been introduced into the well during the installation and surging process. Bailing will continue until approximately four well volumes of water or until an acceptable water quality is achieved.

Specific conductivity, pH, and temperature will be measured during well development until parameters have stabilized. Well development will continue until turbidity measurements below 50 NTUs have been achieved.

The development water will be containerized and transported to the on-site groundwater IRM system for treatment.

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Fax Cover Sheet

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RE: Amended pages for replacement in Lockheed Martin's Great Neck Monitoring Well Installation Work Plan

CC:

Number of pages including cover sheet: 5