ARCADIS

Infrastructure, environment, buildings

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Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Remedial Action, Bureau A
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

ENVIRONMENTAL

Subject:
Revised Phase 1B Remedial Investigation Work Plan,
Bethpage Community Park, Former Grumman Settling Ponds (Operable Unit 3),
Bethpage, New York.

Date:
25 May 2005

Contact:
David E. Stern

Phone:
(631) 391-5284

Email:
dstern@arcadis-us.com

Our ref:
NY001348.0805.00001

Dear Mr. Scharf:

ARCADIS is submitting this revised work plan on behalf of Northrop Grumman Corporation (NGC) to conduct an additional investigation (Phase 1B) at the Bethpage Community Park (Park) site as part of the on-site portion of the Operable Unit 3 (OU3) Remedial Investigation . This Phase 1B RI work plan is intended to be dynamic in nature to allow flexibility in scope (based on findings), and includes the proposed data collection, analysis, and evaluation methodologies to be used as well as a tentative schedule. Table 1 summarizes the proposed field activities and laboratory analyses. Figure 1 shows the site plan and the proposed work activity locations. The plan proposed herein incorporates the goals and methods that are described in the NYSDEC-approved Phase 1 work plan, dated June 7, 2004. The June 7, 2004 work plan detailed the Phase 1 work at the Park and ARCADIS' report to the NYSDEC, dated December 1, 2004, contained the Phase 1 groundwater results and ARCADIS' plan for the Phase 1A RI. ARCADIS submitted the groundwater results from the Phase 1A RI to the NYSDEC in a May 17, 2005 transmittal.

As you know, after a four-month negotiation period that concluded on May 24, 2005 with the Town of Oyster Bay (TOB) approval of the Site Access Agreement, NGC has been granted access to the Park and TOB right-of-way property to resume the RI. In addition to requesting NYSDEC approval of the proposed work, this Phase 1B RI work plan was prepared to satisfy conditions of the Site Access Agreement and allow the OU3 RI to proceed prior to the summer blackout period, which extends between June 25 and September 6, 2005 and was imposed on NGC by the TOB for work to be conducted on Park property. Further, in accordance with the OU3 Order on Consent (Order) (which will be fully executed in the very near future), a formal RI Work Plan, that incorporates the Phase 1B (and previous phases) scope/methodologies will be prepared and submitted to NYSDEC within 60 days of the effective date of the Order.

In summary, ARCADIS proposes the following Phase 1B RI work scope:

1. **Geophysical Survey:** The area(s) to be investigated during Phase 1B will be investigated by geophysical means to mark-out the locations of underground utilities prior to drilling.

2. **Vertical Profile Borings (VPBs):** Six VPBs (VPB-21 to VPB-26) are proposed to investigate the groundwater quality along an east-west transect through the current Park property. Based on the results of these six VPBs, up to six additional "contingency" VPBs (VPB-27 to VPB-32) may be drilled in a similar manner during the same mobilization.

3. **Data Evaluation:** ARCADIS will review, summarize, and interpret the data collected in the above tasks.

ARCADIS' general approach for the proposed work scope, which will be implemented upon receipt of NYSDEC written approval, is described in the following sections.

Pre-Field Preparation

NGC will sign the Site Access Agreement with the TOB to conduct the required field activities, and will implement all applicable notifications and pre-mobilization requirements.

Geophysical Surveying

As required by the Site Access Agreement, NGC will perform an independent location and mark-out of underground utilities and other potential buried obstructions prior to commencing intrusive work. The geophysical surveying task will be performed by a geophysical subcontractor and will serve to identify and delineate locations of subsurface utilities and any other potential metallic anomalies within the area proposed for VPB installation. Specifically, a high-resolution electromagnetic survey (using a Geonics EM-61 portable survey unit) will be used to mark out the locations of the on-site utilities along a corridor around the proposed VPBs (Figure 1) to be installed. New York State One-Call will also be contacted before subsurface work begins.

Vertical Profile Borings

The results of the VPBs that were drilled and sampled in 2004 and early 2005 indicated the potential for a source(s) of volatile organic compounds (VOCs) within the Park, however the location and full extent of this source(s) is not presently known. The objectives of the Phase 1B RI work are as follows: (1) fill data gaps in the Park with the goal of narrowing the focus on the source(s) of groundwater VOC

impacts (if source-strength levels are found in one or more areas) and/or eliminating a portion(s) of the Park (that is upgradient of the VPBs) as a source(s), and (2) determine the off-site direction of the VOC plume so that the number, location, and depth of off-site VPBs may be determined.

ARCADIS will utilize Delta Well & Pump Co., Inc. to drill and sample the proposed VPBs. The driller will mobilize a hollow-stem auger drilling rig and ancillary vehicles/equipment to the previously-designated staging area on the NGC commissary property (west of the Park). The scope of the proposed Phase 1B RI investigation will include the drilling and collection of soil and groundwater samples from six VPBs on Park property. Selected soil samples will be collected above the water table from each VPB for laboratory analysis of VOCs. Groundwater samples will be collected from each VPB for laboratory analysis of VOCs. The field work will involve drilling, geophysical logging, and soil/groundwater sample collection consistent with previous work done at the Park and on the NGC Plant 24 Access Road. ARCADIS may adjust laboratory turnaround times to accelerate/optimize the drilling program, based on the timing of groundwater quality results obtained. ARCADIS will provide a full-time qualified on-site field hydrogeologist to oversee/document activities and collect soil and groundwater samples.

In general, VPB drilling, sampling, and abandonment will consist of the following (site specific conditions may warrant slight modifications to this approach):

1. Concrete coring performed, as needed, to access the subsurface and to minimize disturbance to the surrounding area. Background air monitoring per the Community Air Monitoring Plan (CAMP – Attachment 1) will be performed.

2. VPB borehole drilling and split-spoon soil sampling (to be performed at 5-foot intervals from land surface to a depth of 20 feet below land surface [ft bls]). A representative sample(s) of soil will be collected for possible submittal for laboratory analysis, pending the results of field headspace screening of the soil. Soil sample headspace will be measured in the field with a photoionization detector (PID). If PID readings are approximately an order of magnitude above background (assuming background is not non-detect) then the associated soil sample collected will be submitted for laboratory analysis of VOCs using NYSDEC Analytical Services Protocol Method 2000. Once the water table is reached (approximately 60 ft bls), split spoon sampling will proceed at 10 ft intervals until the total depth of the VPB is reached (estimated to be 110 ft bls). Selected soil samples collected below the water table will be submitted for analysis of total organic carbon (TOC).
3. Borehole geophysical logging (natural gamma) and selection of groundwater sampling intervals.

4. Installation of temporary well point (black steel casing/stainless steel screen) to the specified depth (estimated at 110 feet below land surface).
5. Purging of groundwater from the VPB temporary well using a 2-inch diameter submersible pump. Field parameters pH, specific conductance, and temperature, will be monitored. Collection of groundwater sample and upward retraction of temporary well point to next selected sampling interval (10-foot intervals are proposed).
6. Submittal of groundwater samples to a NYS-certified laboratory for analysis of Target Compound List (TCL) VOCs using NYSDEC Analytical Services Protocol (ASP) Method 2000. Sample handling, collection, and analysis protocols will be consistent with the Quality Assurance Project Plan (QAPP) developed for the NGC site (ARCADIS G&M, Inc. 2002).
7. Decontamination of rig and tools using high-pressure steam cleaning (performed at the staging area), removal of investigation-derived waste to the staging area, abandonment of the VPB borehole, and mobilization to the next VPB location. Site restoration will be also conducted as needed.
8. Surveying of the VPB locations to the NYS Plane Coordinate System and National Geodetic Vertical Datum.

The NGC Health and Safety Plan (ARCADIS G&M, Inc. 2004) and New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP – Attachment 1) will be followed for all site work.

Data Evaluation

During the course of drilling VPBs VP-21 to 26, ARCADIS will re-evaluate the need for, location, and depth of contingency VPBs VP-27 to 32. If the proposed scope/locations of the contingency VPBs change substantially, ARCADIS will prepare an amended table summarizing the revised contingency scope of work and an updated site plan showing the revised locations of contingency VPBs and submit this to the NYSDEC and TOB prior to drilling. The data evaluation presented below will be incorporated into the OU3 RI Report (to be prepared).

Data evaluation of the VPB groundwater data will include validation of the data (consistent with NYSDEC DER-10 Draft Site Characterization Guidance Document [2002]), an update/modifications to the existing data tables, updates/modifications to the draft hydro-chemical cross sections and updates to draft plan-view VOC plume maps that were provided to NYSDEC in our December 1, 2004 report.

Data validation and useability requirements/protocols will be consistent the QAPP developed for the NGC site (ARCADIS G&M, Inc. 2002).

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Schedule

The Remedial Investigation Site Operations Plan (RISOP) has been prepared in accordance with Section 4 of the TOB Site Access Agreement and is provided with this work plan as Attachment 2 for your reference. As a NYSDEC-approved work plan must be submitted to TOB prior to our mobilization to the site, we would appreciate NYSDEC's prompt review and approval of this work plan. The Site Access Agreement was approved by the TOB Board on May 24, 2005 and ARCADIS has provided the required five-day notification to TOB on May 25, 2005 for mobilization to the site to on June 2, 2005. Using two drilling rigs with two drilling/ sampling crews, ARCADIS anticipates that the work scope described herein can be completed before June 25, 2005 ARCADIS will propose off-site VPBs locations to NYSDEC in an addendum to this work plan.

If you have any questions or comments, please feel free to call.

Sincerely,

ARCADIS G&M, Inc.

David E. Stern
Senior Hydrogeologist

Carlo San Giovanni

Carlo San Giovanni
Project Manager

Michael Wolfert
Project Director

Enclosures

Copies:
John Cofman, Northrop Grumman
Larry Leskovjan, Northrop Grumman

Table 1. Summary of Phase 1B On-Site Remedial Investigation and Rationale, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Description of Activity Location Identification	Proposed Total Depth (ft bls)	Proposed Soil Sampling Intervals (ft)	Proposed Soil Analysis	Proposed Groundwater Sampling Intervals (ft)	Proposed Groundwater Analysis	Proposed Geophysical Logging	General Rationale
Vertical Profile Borings							
VP-21	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	On-site shallow VPBs will be drilled to better define the vertical and horizontal extent of the on-site portion of groundwater VOC standard exceedences that were identified in the Phase 1 and Phase 1A VPBs and on-site monitoring wells. VPBs will be drilled in the Park (Figure 1). Geophysical logging will be performed to provide a continuous profile of borehole lithology. Based on lithology in VPBs the groundwater sampling interval may be adjusted.
VP-22	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	
VP-23	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	
VP-24	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	
VP-25	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	
VP-26	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	
Contingency Vertical Profile Borings							
VP-27	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	Contingency borings to be added based on ongoing evaluation of results obtained from VP-21 to 26.
VP-28	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	
VP-29	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	
VP-30	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	
VP-31	110	5 / 10 (1)	Lithology / VOC	10 (1)	VOC (2)	Yes (4)	
VP-32	110	5 / 10 (1)	Lithology / VOC / TOC (2) (3)	10 (1)	VOC (2)	Yes (4)	

See footnotes and definitions on last page

Table 1. Summary of Phase 1B On-Site Remedial Investigation and Rationale, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Footnotes:

(1) Groundwater sampling shall commence from the bottom of the borehole and will proceed at the following intervals: 105-110 ft bls, 90-95 ft bls, 80-85 ft bls, 70-75 ft bls, and 60-65 ft bls (the water table is estimated to be 60 ft bls).
Soil sampling will commence at 5 ft bls and proceed at 5-ft intervals to 20 ft bls. At the water table (estimated at 60 ft bls) soil sampling will proceed at 10-ft intervals to depth.

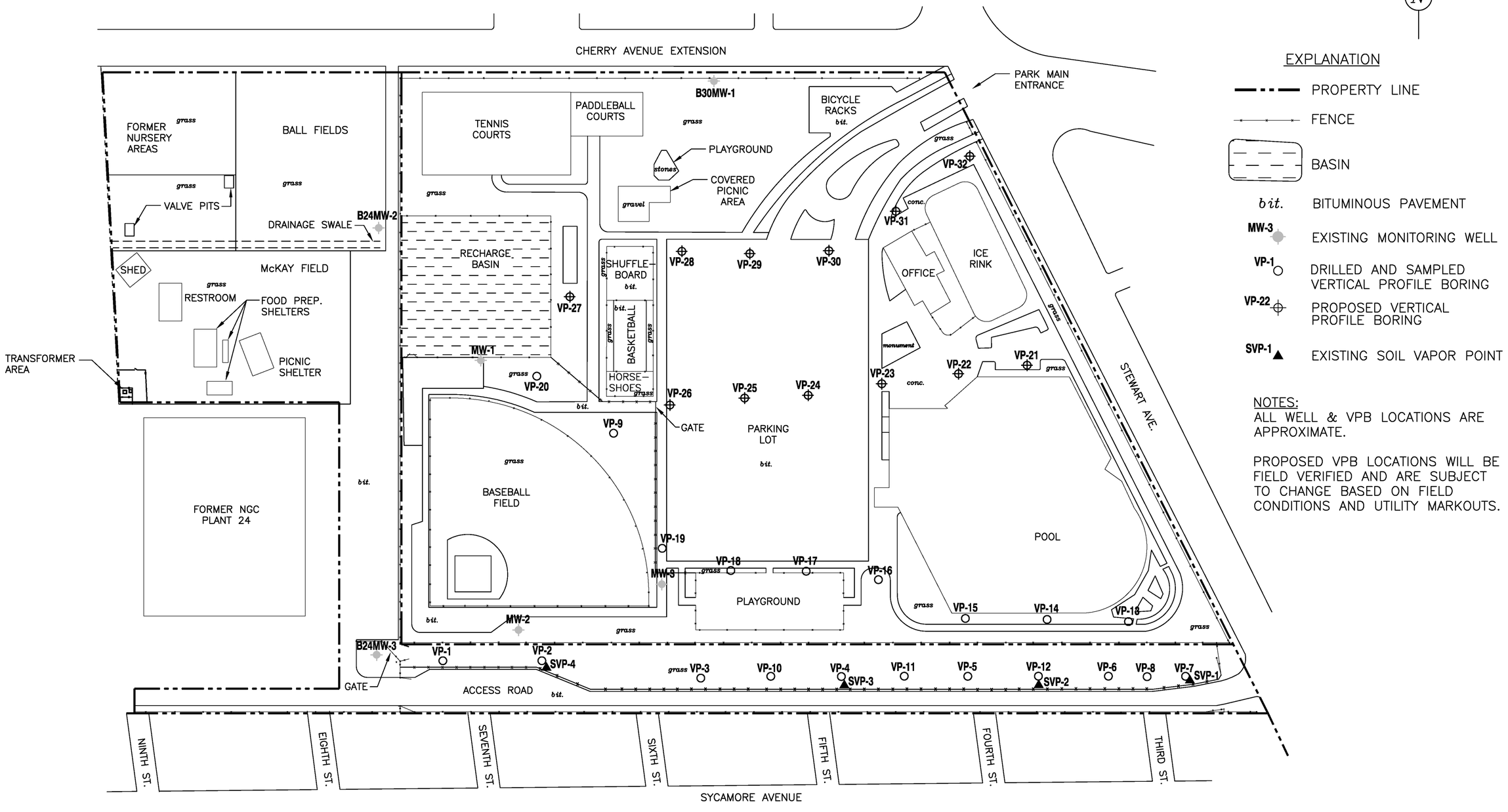
(2) Soil and/or water sample analysis shall be performed using the following methods:
- VOCs: TCL List of VOCs using NYSDEC ASP Method 2000.
- TOC: USEPA Method 9060.

(3) TOC samples will be collected from selected VPBs at a selected interval below the water table.

(4) Geophysical logging will be performed using the natural gamma method.

Definitions:

VPB	Vertical Profile Boring
ft bls	feet below land surface
TCL VOC	Target Compound List of Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
TOC	Total Organic Carbon
NYSDEC	New York State Department of Environmental Conservation



DRAWING REFERENCE:
DVIRKA AND BARTILUCCI 2003

REV. ISSUED DATE DESCRIPTION

SEAL

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PROJECT TITLE
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS
BETHPAGE, NEW YORK

PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		D. STERN

SHEET TITLE
SITE PLAN SHOWING EXISTING & PROPOSED SOIL VAPOR POINTS AND VERTICAL PROFILE BORINGS

TASK/PHASE NUMBER	DRAWN BY
00001	E. HUGHES

PROJECT NUMBER	DRAWING NUMBER
NY001348.0805	1

Attachment 1
Community Air Monitoring Plan
Northrop Grumman Corporation, Bethpage, New York.

Date Prepared: May 18, 2005

Introduction

In accordance with New York State Department of Health (NYSDOH) requirements, this Community Air Monitoring Plan (CAMP) has been prepared for use during certain investigative and remedial field activities associated with the Northrop Grumman Corporation (NGC), Bethpage Facility (Site). This CAMP serves to present the methods and procedures to conduct real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at each designated work area when certain activities are in progress. This CAMP is not intended for use in establishing action levels for worker respiratory protection; action levels are described in the Northrop Grumman Corporation Health and Safety Plan (HASP) (ARCADIS G&M, Inc. 2004). The intent of this CAMP is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers that are not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities that are related to the Site. The response levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, this CAMP helps to confirm that work activities do not spread contamination off-site through the air.

Depending upon the nature of the site-related contaminants of concern, chemical-specific monitoring, with appropriately-sensitive methods, may be required during field work (please refer to the HASP for details).

Reliance on this CAMP does not preclude simple, common-sense measures to keep potential VOCs, dust, and odor emissions at a minimum around work areas.

The following sections of this CAMP present the monitoring instrumentation required to comply with NYSDOH policy, the frequency of monitoring, response levels, and response actions.

Monitoring Instrumentation

Based on the currently available analytical data and the contaminants of concern for the NGC Site, real-time air monitoring for VOCs and particulates at the perimeter areas of the work area (i.e., the exclusion zone – see HASP for definition) will be necessary for field activities associated with investigation and remediation of the NGC Site.

VOC monitoring will be performed using real-time monitoring instrumentation that is appropriate to measure the types of VOCs known or suspected to be present at the work location (please refer to the HASP for details). The equipment will be calibrated on the frequency and using the methods described in the HASP. It is preferable to use instrumentation that is capable of calculating 15-minute running average concentrations or provide a written record of readings taken during monitoring events. If neither capability is available, then the reading obtained every 15 minutes will be used for decision making.

The particulate monitoring will be performed using real-time monitoring instrumentation that is capable of measuring particulates less than 10 micrometers in size (PM-10). It is preferable to use instrumentation that is capable of calculating 15-minute running average concentrations or provide a written record of readings taken during monitoring events. If neither capability is available, then the reading obtained every 15 minutes will be used for decision making. The particulate monitoring equipment will be equipped with an audible alarm to indicate exceedence of the response level.

Monitoring Frequency

This section defines the typical activities that will occur in relation to the NGC Site and relates these activities to the frequency of monitoring required.

Continuous monitoring for VOCs and particulates will be carried out for intrusive activities. Additionally, upwind VOC and particulate concentrations will be measured at the **start** of each work day and **periodically** (see below) thereafter to establish the background concentration. Ground intrusive activities typically include the following:

1. Soil excavation and handling.
2. Test pitting or trenching.
3. Drilling and installation of vertical profile borings, soil borings, and/or wells.
4. During the demolition of contaminated or potentially contaminated structures.
5. Construction activities involving earthwork or disturbance of earthen surfaces.
6. Other activities specified in this CAMP.

Periodic monitoring for VOCs will be carried out during non-intrusive activities. For non-intrusive activities, the upwind concentrations will be measured at the **start and finish** of the work effort to establish the background concentration. Non-intrusive activities typically include the following:

1. Site Mobilization/Demobilization of equipment and machinery.
2. Drum or container sampling.
3. Soil sampling (to the extent not coinciding with intrusive work).

4. Groundwater sampling.
5. Water-level measurements.
6. Surveying (geophysical, coordinate/elevation).
7. Well development.
8. Waste transportation.
9. Site preparation and restoration that does not involve re-grading or other disturbances to surface materials.

"Periodic"m onitoring should be performed, at a minimum as follows:

1. Upon arrival at a work location to determine the ambient, or background concentrations.
2. During each phase of work that potentially may generate VOC emissions to the air.
3. Prior to leaving the work location.

As an example, "Periodic" monitoring for VOCs during sample collection activities shall include monitoring as above and during the following times:

1. When accessing wells, opening drums or containers, or overturning soil.
2. During well bailing/purging.
3. During collection of samples (soil/sediment/water).

For non-intrusive activities, particulate monitoring will not be performed.

Continuous monitoring for VOCs will be carried out during activities that occur on the Bethpage Community Park property.

VOC Monitoring Station Locations, Response Levels, and Actions

During each workday, the VOC monitoring station will be positioned at the downwind perimeter of the work area (i.e., the exclusion zone – see HASP for definition). As stated above, monitoring frequency (periodic or continuous) will be determined based on whether the activity is considered intrusive or non-intrusive (or whether the activity is occurring on Bethpage Community Park property). The direction of wind (if any) will be periodically recorded during each work day and re-positioning of upwind/downwind monitoring stations will be performed accordingly.

The VOC monitoring instrumentation output documenting 15-minute running average concentrations (or printed output of readings taken or the reading taken every 15 minutes, as available), will be compared to the following response levels:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 parts per million (ppm) **above background** for the 15-minute average, work activities will be temporarily halted and monitoring continued.

If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm **above background** but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15- minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All readings will be recorded on the appropriate air monitoring log (please refer to the HASP for details) or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

Particulate Monitoring Station Locations, Response Levels, and Actions

For intrusive activities, the particulate (i.e., dust) monitoring station will be positioned at the downwind perimeter of the work zone (i.e., exclusion zone – see HASP for definition). In addition, fugitive dust migration will be visually assessed during all work activities. The direction of wind (if any) will be periodically recorded during each work day and re-positioning of the downwind monitoring station will be performed accordingly. The response levels and actions for fugitive dust are as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater **than background** (upwind perimeter) for the 15-minute period or if airborne dust is visually observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is observed leaving the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the **background** concentration, then work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust from leaving the work area.

All readings will be recorded on the appropriate air monitoring log (please refer to the HASP for details) or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

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VIA EXPRESS MAIL

Messrs. Gregory J. Giammalvo, Esq., Town Attorney and
Steven L. Labriola, Town Clerk
Town of Oyster Bay
Town Hall West
74 Audrey Avenue
Oyster Bay, New York 1771

ENVIRONMENT

Subject:
Remedial Investigation Site Operations Plan,
Operable Unit 3 – Former Grumman Settling Ponds (Bethpage Community Park),
Bethpage, New York.

Date:
May 25, 2005

Contact:
David E. Stern

Phone:
631-391-5284

Email:
dstern@arcadis-us.com

Our ref:
NY001348.0805.0001

Dear Messrs. Giammalvo and Labriola:

In accordance with Section 4 of the Site Access Agreement ("Agreement") between Town of Oyster Bay ("Town") and Northrop Grumman Systems Corporation (NGSC) that was received by Mr. Frank Amoroso, Esq. from Mr. Theodore W. Firetog, dated May 17, 2005, ARCADIS has prepared this Remedial Investigation Site Operations Plan (RISOP) for Phase 1B of the Remedial Investigation (RI) for the Former Grumman Settling Ponds (Bethpage Community Park), Bethpage, New York (Site) ("RI activities"). Figures 1 and 2 (enclosed) provide details on the RISOP that are consistent with the requests made in Section 4 of the Agreement.

Also included in this letter are the following:

1. Project Schedule, in accordance with Section 4 of the Agreement (see "Project Schedule", below).
2. Formal notification to the Town of NGSC's intention to initiate the RI activities specified herein, in accordance with Section 7 of the Site Access Agreement (see "Notifications", below).
3. Description of Field Supervision to be provided during the RI activities, in accordance with Section 5 of the Agreement (see "Field Supervision", below).

This document serves as Attachment 2 to the Phase 1B Remedial Investigation (RI) Work Plan prepared by ARCADIS and is intended to be provided collectively to the Town with the following:

1. A copy of the Operable Unit 3 Consent Order that has been signed by NGSC, in accordance with Section 3 of the Agreement.

2. Final Phase 1B RI Work Plan and NYSDEC approval letter, in accordance with Section 4 of the Agreement.
3. ARCADIS' Certificate of Insurance, in accordance with Section 13 of the Agreement.

Introduction

NGSC appreciates the Town's willingness to permit access to its property for the purposes of conducting the required RI activities. As a general approach to performing RI activities on Town property, it is NGSC's intention to conduct such RI activities in a cooperative manner with the Town and to perform all RI activities with the goal of minimizing the effect of RI activities on Town property and the surrounding community.

The RISOP provides information to the Town for RI activities to be performed on the Site (i.e., within the Bethpage Community Park). The work scope for RI activities on Town Rights-of-Way (i.e., off Site) has not been developed since the scope will be contingent on the findings of the Phase 1B RI. ARCADIS will update the RISOP and provide an addendum to this RISOP to the Town that addresses RI activities on Town Rights-of-Way at a later date.

The RI activities that are subject to this RISOP have been described in a work plan that has been submitted to the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) for review and approval (currently pending). The "Phase 1B RI Work Plan" contains (or indicates by reference) a complete description of methods for the field work to be performed as part of the RI activities subject to this RISOP. In general, the work consists of drilling and sampling vertical profile borings (VPBs) (referred to as "Temporary Test Wells" for the purpose of this RISOP). The sequence of activities associated with drilling, installing, and sampling Temporary Test Wells, as is applicable to this RISOP, is provided in the following section.

Remedial Investigation Site Operations Plan

In accordance with Section 4 of the Agreement Before the Phase 1B RI field work begins, the locations and types of underground utilities will be checked (using an independent geophysical specialist and by contacting NYS One-Call), labeled, and verified by ARCADIS or its subcontractor (on behalf of NGSC) so that the Temporary Test Well does not encounter or pass unnecessarily close to underground utilities. The drilling will be performed by a mobile drilling rig using hollow-stem auger methods and operated by a licensed New York State Well Driller. Split-spoon sampling and geophysical logging will be performed in the borehole of each

Temporary Test Well before the well is installed. The "Temporary Test Well" will be installed by the drill rig. The drill rig will then relocate and a second sampling team with a pull rig and support truck will be used to collect groundwater samples from the Temporary Test Well. Groundwater samples will be collected from discrete intervals starting from depth (approximately 110 feet below land surface [ft bls]) and continuing up to the water table (approximately 60 ft bls) as the Temporary Test Well is retracted upward and eventually removed. The Temporary Well borehole will be abandoned by following NYSDEC approved methods. Work site restoration will be performed in accordance with Section 11 of the Agreement.

Figures 1 and 2 describe the complete details of the RISOP for Phase 1B of the RI. Additional information is provided as necessary in this section. As described in Section 4 of the Agreement, the RISOP (this letter collectively with Figures 1 and 2) includes or addresses the following:

1. Project Schedule (See "Project Schedule" below).
2. Site Plan showing the following:
   a. Stockpile Areas (Figure 1).
   b. Staging Area (Figure 1).
   c. Material and Equipment Storage Area (Figures 1 and 2).
   d. Truck routes (for ingress and egress to the Park property and Rights-of-Way (Figure 1). Since the scope of the RI activities on Town RI Rights-of-Way has not been developed at this juncture, the RISOP does not include truck routes for ingress and egress for areas located on Town Rights-of-Way. Such information will be included in a subsequent addendum to this RISOP for future RI activities to be performed on Town Rights-of-Way.
   e. Excavation techniques (Figure 1).
   f. Equipment decontamination areas (Figures 1 and 2). The major decontamination will be performed before work commences at a particular location, between locations, and before demobilizing. Decontamination method will consist of steam cleaning. As stated on Figure 1, major decontamination of rigs, trucks, and downhole tools will be performed in the areas indicated within or near the NGC staging area. Minor washing and rinsing of sampling equipment (split spoons and other small equipment) will occur within the work zone. Such activity will be very limited in nature. All waste will be properly containerized and removed daily from the work area and staged in the NGSC staging area, in accordance with Section 9 of the Agreement.
   g. Temporary sanitary facility locations (Figure 1).

h. Methods of diverting active utilities (Figure 1).

i. Lay-down Areas (Figure 1).

j. Fencing (Figures 1 and 2).

k. Worker Parking (Figure 2). Figure 2 shows the typical work area for each location to be investigated as part of Phase 1B of the RI, and addresses location/orientation of the drilling rig or sampling truck as well as worker/support truck parking at the drilling location.

l. Security Measures (Figures 1 and 2).

m. Name and telephone numbers of three (3) emergency contacts who can be reached on a 24-hour basis (Figure 1).

Notifications

In accordance with Section 7 of the Agreement, ARCADIS on behalf of NGSC hereby provides notification to the Town of the following activities:

1. Underground utility markouts (to be performed by the independent geophysical specialist under the oversight of ARCADIS) are scheduled to be performed on and around the Site on May 31 and June 1, 2005.
2. Driller mobilization to the NGSC staging area will occur June 1, 2005 and drilling of the Temporary Test Wells will commence on June 2, 2005.

Project Schedule

ARCADIS understands that the Town has imposed a work moratorium beginning June 25, 2005 and ending September 5, 2005 pertaining to the subject RI activities on the Site. The schedule proposed has been developed to comply with the provisions of Section 2 of the Agreement, which in sum indicates access shall be limited to the hours of 8:00 AM to 5:00 PM weekdays and that access to the Park to perform work is not permitted on weekends and official Town holidays.

ARCADIS' drilling subcontractor will mobilize up to three rigs to perform the work described in the Phase 1B RI Work Plan while also complying with the time limitation imposed by the Town.

Field Supervision

In accordance with Section 5, ARCADIS shall provide Mr. John Corral, who is an ARCADIS employee. Mr. Corral will serve as the on-site representative and is qualified to supervise the RI activities proposed. If this individual should change, the identification of the replacement Site Supervisor will be submitted to the Town prior to June 2, 2005.

Please contact us if you have any questions or comments.

Sincerely,

ARCADIS G&M, Inc.

David E. Stern
Senior Hydrogeologist

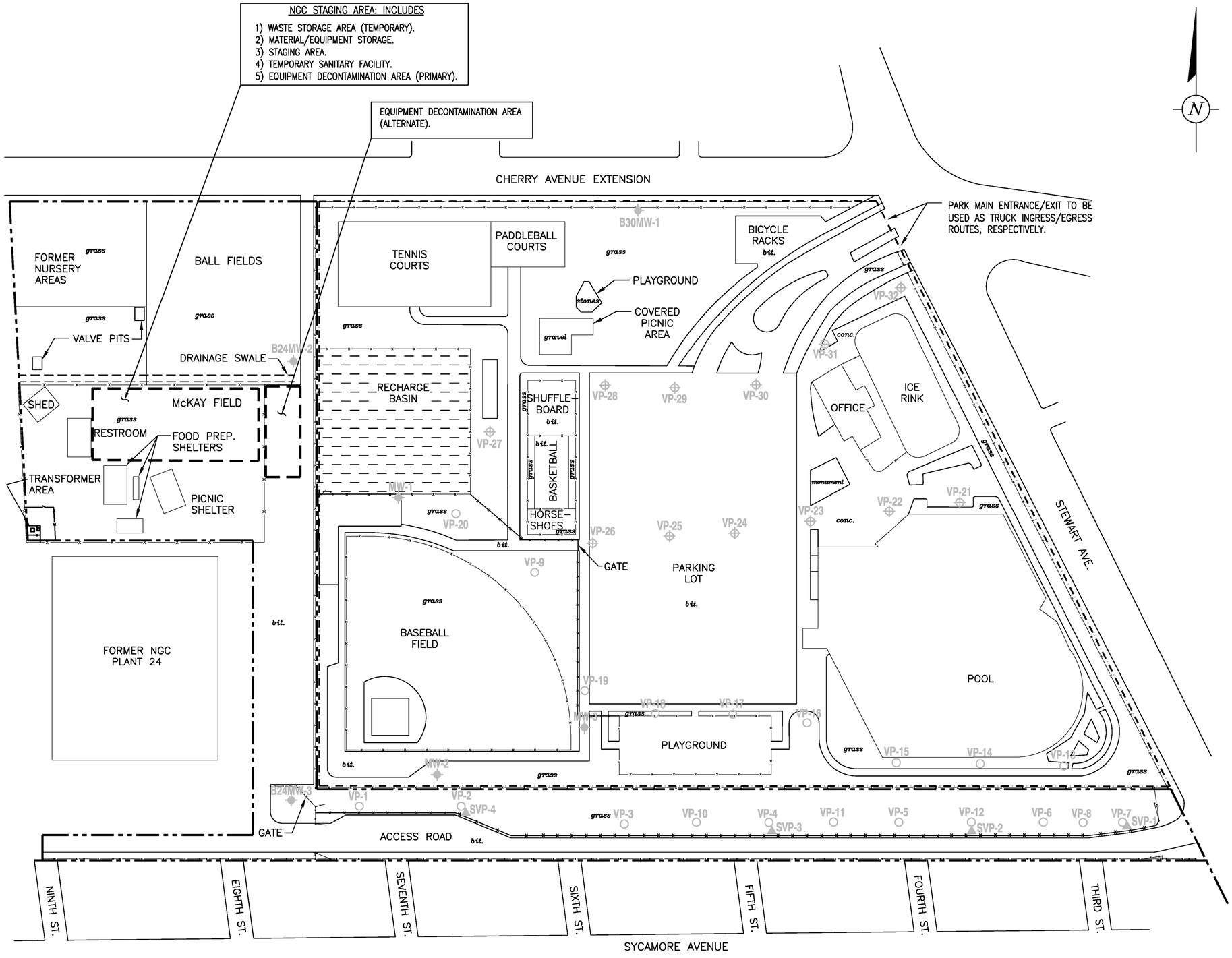
Carlo San Giovanni

Carlo San Giovanni
Project Manager

Michael Wolfert
Project Director

Enclosures

Copies:
Richard W. Lenz, Commissioner, Town of Oyster Bay Public Works
Theodore W. Firetog, Esq., Rivkin Radler, LLP
Jill Palmer, Northrop Grumman
John Cofman, Northrop Grumman
Larry Leskovjan, Northrop Grumman
Frank Amoroso, Esq., Nixon Peabody, LLP



EXPLANATION

- PROPERTY LINE OF TOWN OF OYSTER BAY BETHPAGE COMMUNITY PARK.
- PROPERTY LINE OF NORTHROP GRUMMAN CORPORATION
- FENCE
- BASIN
- bit. — BITUMINOUS PAVEMENT.
- MW-3 — EXISTING MONITORING WELL.
- VP-1 — COMPLETED VERTICAL PROFILE BORING LOCATION.
- VP-22 — PROPOSED VERTICAL PROFILE BORING LOCATION.
- SVP-1 — COMPLETED SOIL VAPOR SAMPLING POINT.

NOTES:

1. ALL WELL & VPB LOCATIONS ARE APPROXIMATE.
2. PROPOSED VPB LOCATIONS WILL BE FIELD VERIFIED AND ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS AND UTILITY MARKOUTS.
3. RIG, SUPPORT TRUCK AND WORKER PARKING WILL BE WITHIN DESIGNATED WORK ZONES AROUND EACH PROPOSED VPB. (SEE DETAILS ON DRAWING No. 2; DIMENSIONS WILL VARY BASED ON ACCESS AND SITE CONDITIONS.)
4. MAJOR EQUIPMENT (i.e., DRILLING RIG AND TOOLS) DECONTAMINATION TO BE PERFORMED AT THE NGC STAGING AREA. MINOR WASH AND RINSE OF SAMPLING EQUIPMENT WILL BE PERFORMED AT VPB LOCATIONS.
5. ALL WORK AREAS ON PARK PROPERTY WILL BE SECURED WITH CAUTION TAPE AND TEMPORARY CONSTRUCTION FENCING AT ALL TIMES.
6. STOCKPILING OF SOIL WILL NOT OCCUR AT VPB LOCATIONS. DRILL CUTTINGS AND WATER WILL BE CONTAINERIZED AND MOVED OFF PARK PROPERTY TO THE NGC STAGING AREA EACH DAY FOR EVENTUAL CHARACTERIZATION AND DISPOSAL.
7. EXCAVATION (OTHER THAN DRILLING) AND DIVERSION OF UTILITIES ARE NOT REQUIRED AND WILL NOT BE PERFORMED.
8. IF NEEDED, WORK AREA EVACUATION WILL INVOLVE SHUTDOWN OF RIG OR SAMPLING OR SUPPORT TRUCK, SECURING THE BOREHOLE AND EXITING THE PARK IN AN ORDERLY MANNER THROUGH THE DESIGNATED EXIT.
9. IN CASE OF QUESTIONS OR CONCERNS 24 HOURS/DAY, PLEASE CONTACT:

JOHN A. VOSILLA
NORTHROP GRUMMAN CORPORATION
600 GRUMMAN ROAD WEST
BETHPAGE, NY 11714-3582
OFFICE: (516) 575-5119
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LARRY LESKOVJAN
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MICHAEL WOLFERT
PROJECT MANAGER
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E-MAIL: MWOLFERT@ARCADIS-US.COM

DRAWING REFERENCE:
DVIRKA AND BARTILUCCI 2003

REV. ISSUED DATE DESCRIPTION

SEAL

0 100' 200'
SCALE: 1" = 100'

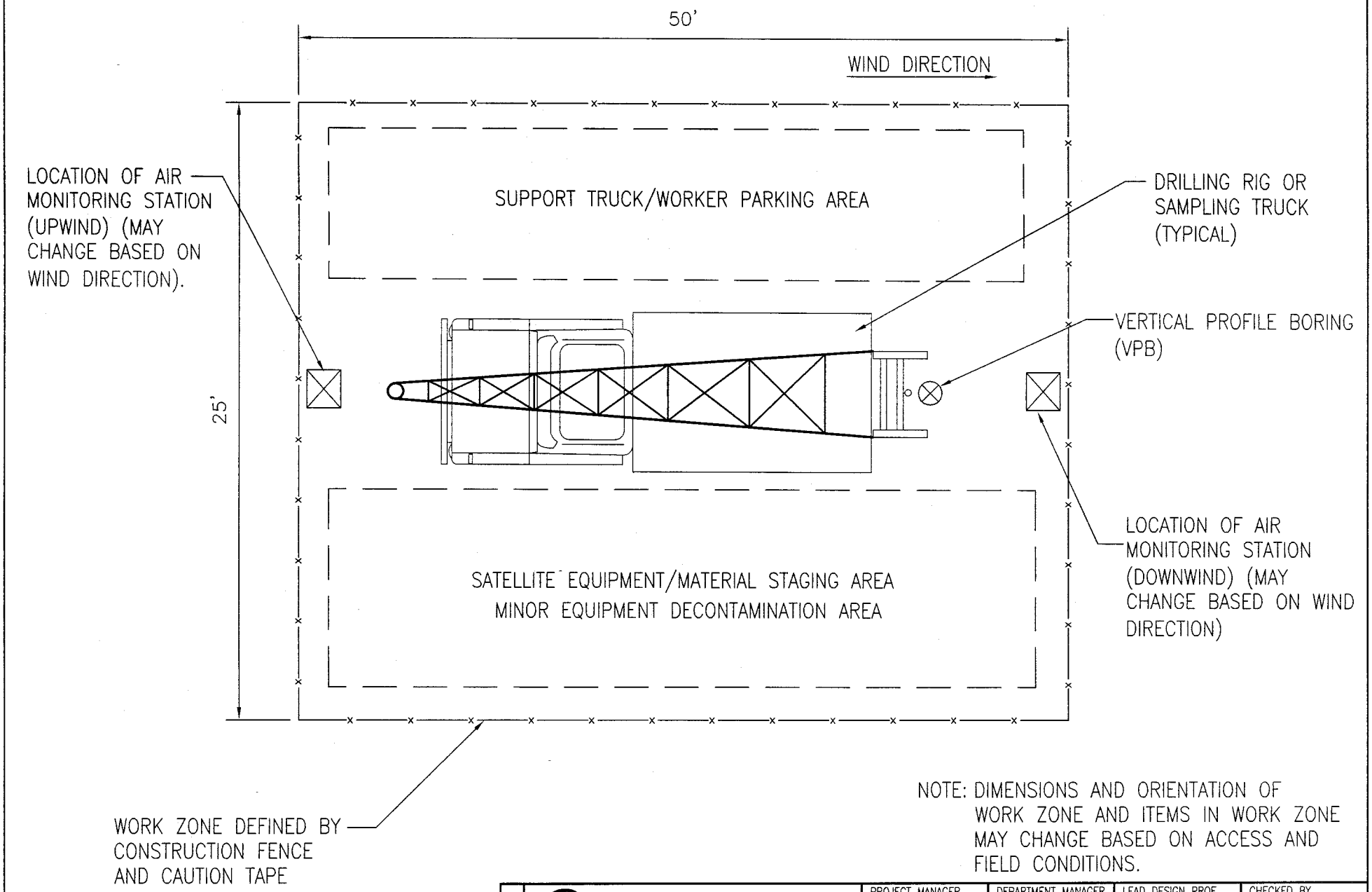
ARCADIS
88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
www.arcadis-us.com

PROJECT TITLE
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS
BETHPAGE, NEW YORK

PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		D. STERN

SHEET TITLE
REMEDIAL INVESTIGATION
SITE OPERATIONS PLAN

TASK/PHASE NUMBER	DRAWN BY
00001	E. HUGHES
PROJECT NUMBER	DRAWING NUMBER
NY001348.0805	1



NOTE: DIMENSIONS AND ORIENTATION OF WORK ZONE AND ITEMS IN WORK ZONE MAY CHANGE BASED ON ACCESS AND FIELD CONDITIONS.

ARCADIS
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PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		D. STERN
SHEET TITLE		TASK/PHASE NUMBER	DRAWN BY
TYPICAL VPB DRILLING/SAMPLING FOOTPRINT		00001	E. HUGHES
		PROJECT NUMBER	DRAWING NUMBER
		NY001348.0805	2