ARCADIS

Infrastructure, environment, facilities

ARCADIS G&M, Inc.
88 Duryea Road
Suite 100
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis-us.com

ENVIRONMENT

Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Subject:
Phase 2 Remedial Investigation Work Plan Addendum No. 3, Former Grumman Settling Ponds (Operable Unit 3, - Bethpage Community Park), Bethpage, New York.

Date:
July 13, 2006

Contact:
David Stern

Phone:
631-391-5284

Email:
dstern@arcadis-us.com

Our ref:
NY001348.0806.00003

Dear Mr. Scharf:

ARCADIS has prepared this Work Plan Addendum No. 3 for Phase 2 of the Remedial Investigation (RI) at the Former Grumman Settling Ponds (Operable Unit 3 – Bethpage Community Park), Bethpage, New York Site. This Work Plan Addendum No. 3 presents the rationale and scope for additional borings to be performed using the Cone Penetrometer Testing (CPT)/Membrane Interface Probe (MIP) methodology. The NYSDEC-approved revised RI/FS Work Plan, dated March 8, 2006, contained the option to implement CPT/MIP borings as a means to define the potential source(s) of volatile organic compounds (VOCs) impacts and further refine the conceptual site model (CSM). CPT/MIP borings were successfully completed in May 2006 in the western portion of the site in accordance with approved Work Plan Addendum No. 1. Based on recent findings (as described in the section entitled "Background and Rationale" below), additional CPT/MIP testing is being proposed to delineate the nature and extent of soil impacts from volatile organic compounds (VOCs) in the eastern portion of the Site, as further detailed below.

Background and Rationale

As part of Phase 2A of the RI (see the revised RI/FS Work Plan for details), Soil Boring B-43, which is located within the northeastern portion of the Parking Lot, was drilled and sampled by Dvirka & Bartilucci Consulting Engineers (D&B). The purpose of Boring B-43 was to determine the vertical extent of polychlorinated biphenyls (PCBs) in soil. PCBs were initially identified in this area by H2M (on behalf of the Town of Oyster Bay) in their Soil Boring G-7. Recall that H2M drilled soil borings along a 50-ft grid throughout the parking lot; the "G series" of soil borings were drilled

in an east-west transect in the northern portion of the Parking Lot beginning immediately west of the shuffleboard court and ending near the ice rink area.

Boring B-43 was drilled and lithologically logged in the field, and in accordance with methods set forth in the approved RI/FS Work Plan, selected samples were submitted for laboratory analysis for VOCs and other analytes. Field observations of soil from the interval of 10 to 12 feet below land surface (ft bls) indicated that the soil sample appeared moist, consisted of discolored fill material, and exhibited a strong odor. Additionally, PID deflections above background concentrations were obtained from samples collected and were recorded on the B-43 boring log. Based on these indications of impacts, the sample from the 10 to 12 ft bls interval was selected for laboratory analysis, and preliminary data from the laboratory indicate that the sample exhibits high concentrations of VOCs (primarily toluene, ethylbenzene, xylenes, cis-1,2-dichloroethene, and vinyl chloride). Other constituents such as semi-VOCs, PCBs, and metals were also selectively analyzed in the laboratory. These data are currently undergoing quality assurance/quality control validation and the final validated data will be submitted to NYSDEC as soon as possible.

Based on the preliminary data (i.e., high concentrations of VOCs) from the 10 to 12 ft bls interval, the borehole lithology was reviewed. The results of this review indicate that a 2-ft thick low-permeability layer (i.e., approximately 12 to 14 ft bls) underlies the impacted interval. Sample PID screening and lithologic logging performed from 12 to 22 ft bls (total depth) indicate low to background PID concentrations and that native soil is present.

In evaluating the Boring B-43 results, D&B also reviewed historical site aerial photographs and lithologic logs from nearby soil borings drilled and sampled by H2M. D&B also compared the depth of Boring B-43 impact to the proposed depth of the Town Interim Remedial Measure (IRM) excavation and the location of Boring B-43 to the footprint of the proposed new ice rink. The results of these efforts are summarized as follows:

- The aerial photographs did not indicate significant activity within this portion of the park, with the exception of some nearby minor earthwork activities.

- Review of lithologic logs from nearby H2M borings (H2M 2005a; 2005b) indicates that similarly visually impacted soil was observed extending eastward from the current shuffleboard courts, through the "B-43 Area" location toward the former ice rink, with depths ranging from 5 to 14 ft bls. However, H2M did not appear to

have collected samples for laboratory analysis from this interval, so the evidence of soil impacts from the H2M logs is qualitative in nature.

- Based on comparison of the maximum depth of potential VOC impacts identified in Boring B-43 and H2M borings (14 ft bls) to the proposed depth of Town IRM excavation (12 ft bls), it is possible that significant concentrations of VOCs could remain in soil at the conclusion of the Town's remedial effort, based on the location of B-43 relative to the currently proposed ice rink. Additionally, it is possible that a portion of the proposed ice rink building will overlie the area of elevated VOCs in shallow soil.

ARCADIS reviewed existing groundwater quality data (provided in Appendix E of the revised RI/FS Work Plan) that indicated that similar chlorinated VOCs were detected in groundwater vertical profile borings located downgradient of the "B-43 Area". As stated in the CSM for the site (see the RI/FS Work Plan for the complete CSM), the groundwater data suggest residual VOC mass is present in soil and that such mass can result in groundwater impacts that persist many years after site operations ceased. The current soil data overall from the "B-43 Area" are not sufficient to determine the nature and extent of soil impacts. Additionally, as with the Rag Pit Area, the underlying low-permeability zone identified by H2M and later by D&B may be similarly retarding vertical VOC migration in the subsurface; however the mechanism driving VOC migration in this area is not currently known.

Based on this information, ARCADIS recommends the collection of additional soil quality data from within/vicinity of the "B-43 Area" to update the CSM with respect to site soils as well as the overarching RI objectives stated in the RI/FS Work Plan. The following sections present the technical work plan proposed for the "B-43 Area".

Technical Work Plan

Figure 1 shows proposed subsurface utility mark-out area. Figure 2 depicts the alphanumeric grid and existing and proposed CPT/MIP borings.

Prior to drilling, subsurface utilities will be identified and marked out using an independent geophysical subcontractor. The CPT/MIP borings provide a rapid, continuous profile of soil type (through a variety of soil characteristics) and VOC concentrations. Collection of CPT/MIP data above, within, and below the low permeability zone is necessary to confirm the absence or presence of VOCs and obtain information on low permeability zone physical characteristics. This

information will assist in the update of the CSM (i.e., determination of the vertical and horizontal extent of VOCs in soil and whether the physical characteristics of the low permeability zone are such that it could act as a source of groundwater VOCs). The CPT/MIP borings will be performed in a portion of the existing alphanumeric grid focused at and around the B-43 area. Initially, a total of five CPT/MIP borings are proposed (i.e., Borings N-8, O-7, O-8, O-9, and P-8). The final number of CPT/MIP borings will be determined in the field based on the results obtained. CPT/MIP borings will be advanced to the water table (approximately 55 ft bls) at each location; the total depth may be modified depending on field conditions and results obtained.

After completion of the CPT/MIP borings and evaluation of the results, the plan for follow-up soil boring drilling and sampling of soil will be prepared and submitted to NYSDEC in a subsequent work plan addendum. The magnitude and extent of impacts identified by CPT/MIP will be confirmed through the collection and laboratory analysis of soil samples. Based on an evaluation of the CPT/MIP data, soil samples will likely be collected from areas exhibiting the highest MIP results as well as perimeter locations to provide horizontal delineation. The number, location and depths of the samples will be determined based on the CPT/MIP results. Based on the analytical data obtained during the previous sampling round, the soil samples collected will likely be analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, PCBs, chromium, total organic carbon, and selected geotechnical analysis. Sample collection procedures will be consistent with those set forth in the approved RI/FS Work Plan.

Schedule and Logistics

After discussion with NYSDEC, ARCADIS understands that the Town intends to initiate excavation as part of their IRM in early August 2006 (although the Town has not provided a formal schedule to date). ARCADIS' work schedule has been developed to minimize the impact of the work proposed herein on Town IRM activities. The utility mark-outs will be completed in one day, on July 15, 2006. The CPT/MIP borings will commence on or about July 17, 2006. ARCADIS expects that up to two CPT/MIP borings can be drilled per day. Assuming ten CPT/MIP borings are ultimately drilled, ARCADIS expects that the work can be completed in five days. ARCADIS expects to receive the final CPT/MIP report within two weeks of completion of work. Following evaluation of the final CPT/MIP data, the work plan addendum for confirmatory soil sampling will be prepared and submitted to NYSDEC. ARCADIS is hopeful that the confirmatory sampling can be completed by

the end of August 2006; however, the timing and scope of confirmatory sampling are not currently known.

Depending on when the Town commences its IRM activities, it is possible that ARCADIS' and D&B's field work in the B-43 area will conflict with Town IRM activities. In this regard, NGC requests that the NYSDEC direct the Town to re-plan the schedule for IRM intrusive work or other potentially interfering activities within the B-43 Area to allow the RI field work to proceed as presented herein.

We appreciate NYSDEC's expedited review and approval of this work plan and response on the requested coordination with Town IRM activities. If you have questions or comments, please contact us.

Sincerely,

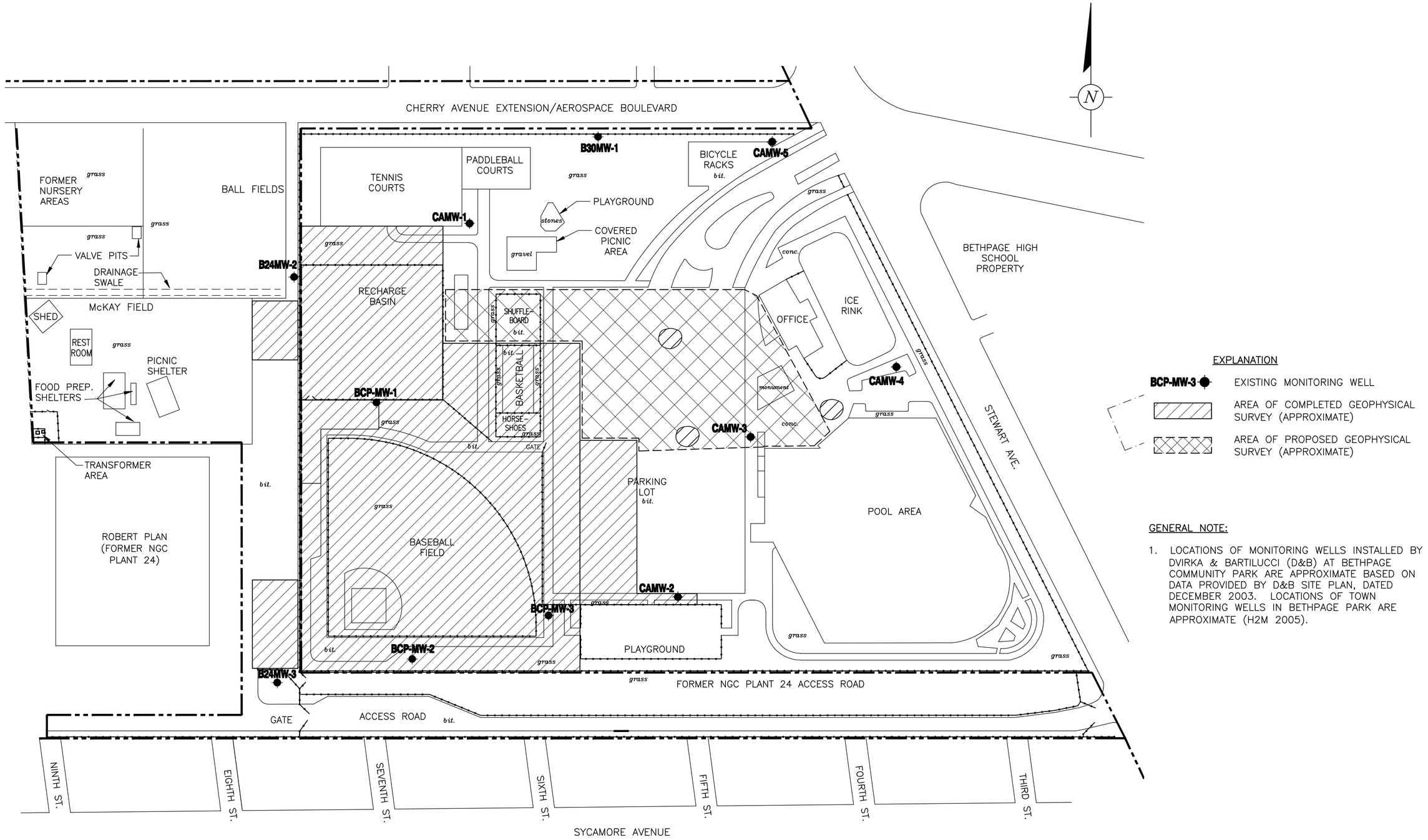
ARCADIS G&M, Inc.

David E. Stern
Senior Hydrogeologist

Carlo San Giovanni
Project Manager

Enclosures

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



EXPLANATION

- BCP-MW-3 — EXISTING MONITORING WELL
- AREA OF COMPLETED GEOPHYSICAL SURVEY (APPROXIMATE)
- AREA OF PROPOSED GEOPHYSICAL SURVEY (APPROXIMATE)

GENERAL NOTE:

1. LOCATIONS OF MONITORING WELLS INSTALLED BY DVIRKA & BARTILUCCI (D&B) AT BETHPAGE COMMUNITY PARK ARE APPROXIMATE BASED ON DATA PROVIDED BY D&B SITE PLAN, DATED DECEMBER 2003. LOCATIONS OF TOWN MONITORING WELLS IN BETHPAGE PARK ARE APPROXIMATE (H2M 2005).

DRAWING REFERENCE:
DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS 2003

NO.	DATE	REVISION DESCRIPTION	BY / CKD

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

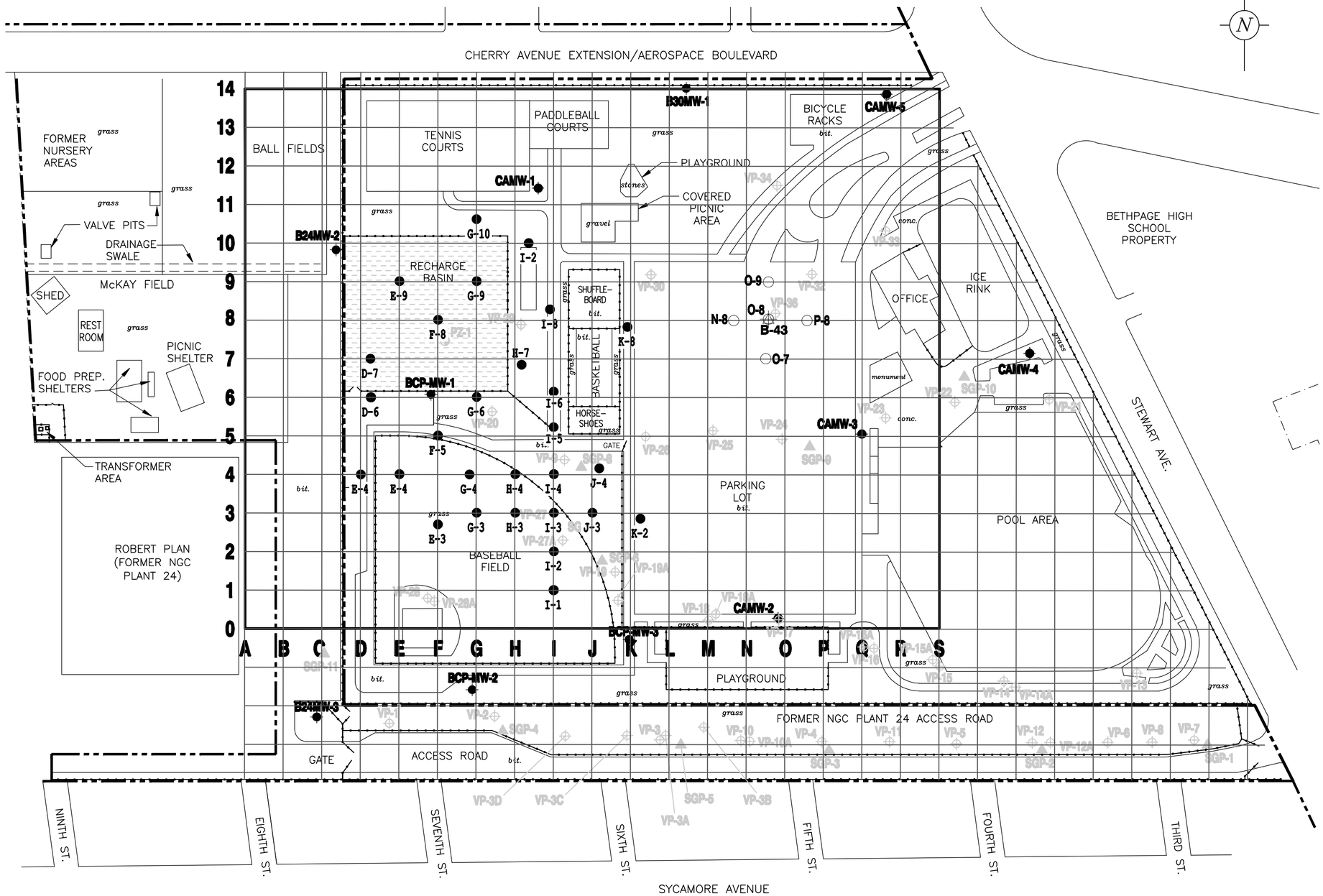
PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGNER	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		D. STERN

SHEET TITLE
PHASE 2 REMEDIAL INVESTIGATION
SITE MARK OUTS

TASK/PHASE NUMBER	DRAWN BY
00004	A.L. SANCHEZ

PROJECT NUMBER	DRAWING NUMBER
NY001348.0806	1

Acad Version : R17.0s (LMS Tech)
User Name : disanchez
Date\Time : Wed, 12 Jul 2006 - 5:29pm
Path\Name : G:\APROJECT\Northrop Grumman\Cadd\OU3\2006\1-MARK OUTS_EX-MW.dwg - Layout Tab : BETHPAGE PARK PLAN



EXPLANATION

- NORTHROP GRUMMAN CORPORATION PROPERTY LINE
- FENCE
- BASIN
- *bit.* BITUMINOUS PAVEMENT
- C-6 ● COMPLETED CPTU/MIP BORING
- O-9 ○ PROPOSED CPT/MIP BORRING
- BCP-MW-3 ● EXISTING MONITORING WELL
- VP-1 ⊕ COMPLETED VERTICAL PROFILE BORING (BY ARCADIS)
- SGP-1 ▲ COMPLETED SOIL GAS POINT (BY ARCADIS)
- B-43 ⊕ LOCATION OF COMPLETED PHASE 2A RI SOIL BORRING

FT MSL	FEET RELATIVE TO MEAN SEA LEVEL
FT BLS	FEET BELOW LAND SURFACE
CPTU	CONE PENETROMETER TESTING UNIT
MIP	MEMBRANE INTERFACE PROBE

NOTES:

1. WELL, SGP, AND VPB–21 TO VPB–33 LOCATIONS ARE APPROXIMATE.
2. LOCATIONS OF WELLS INSTALLED BY THE TOWN OF OYSTER BAY ARE BASED ON THE 2005 REPORTS, LOCATIONS ARE APPROXIMATE (H2M 2005a;b).
3. GRID BOX DIMENSIONS ARE 50–FT SQUARE.
4. PROPOSED CPT/MIP BORINGS WILL BE DRILLED TO THE WATER TABLE (EST. 55FT BLS).

DRAWING REFERENCE:
DVIRKA AND BARTILUCCI CONSULTING ENGINEERS 2003

NO.	DATE	REVISION DESCRIPTION	BY / CKD

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: C. SAN GIOVANNI	DEPARTMENT MANAGER: M. WOLFERT	LEAD DESIGNER:
			CHECKED BY: D. STERN
SHEET TITLE: SITE PLAN SHOWING PROPOSED AND COMPLETED CPT/MIP BORINGS	TASK/PHASE NUMBER: 00004		DRAWN BY: A.L. SANCHEZ
	PROJECT NUMBER: NY001348.0806		DRAWING NUMBER: 2