

Update on Operable Unit 3 Remedial Investigation/ Interim Remedial Measures

Bethpage Community Park
June 27, 2007

NEW YORK STATE
DEPARTMENT OF



ENVIRONMENTAL
CONSERVATION



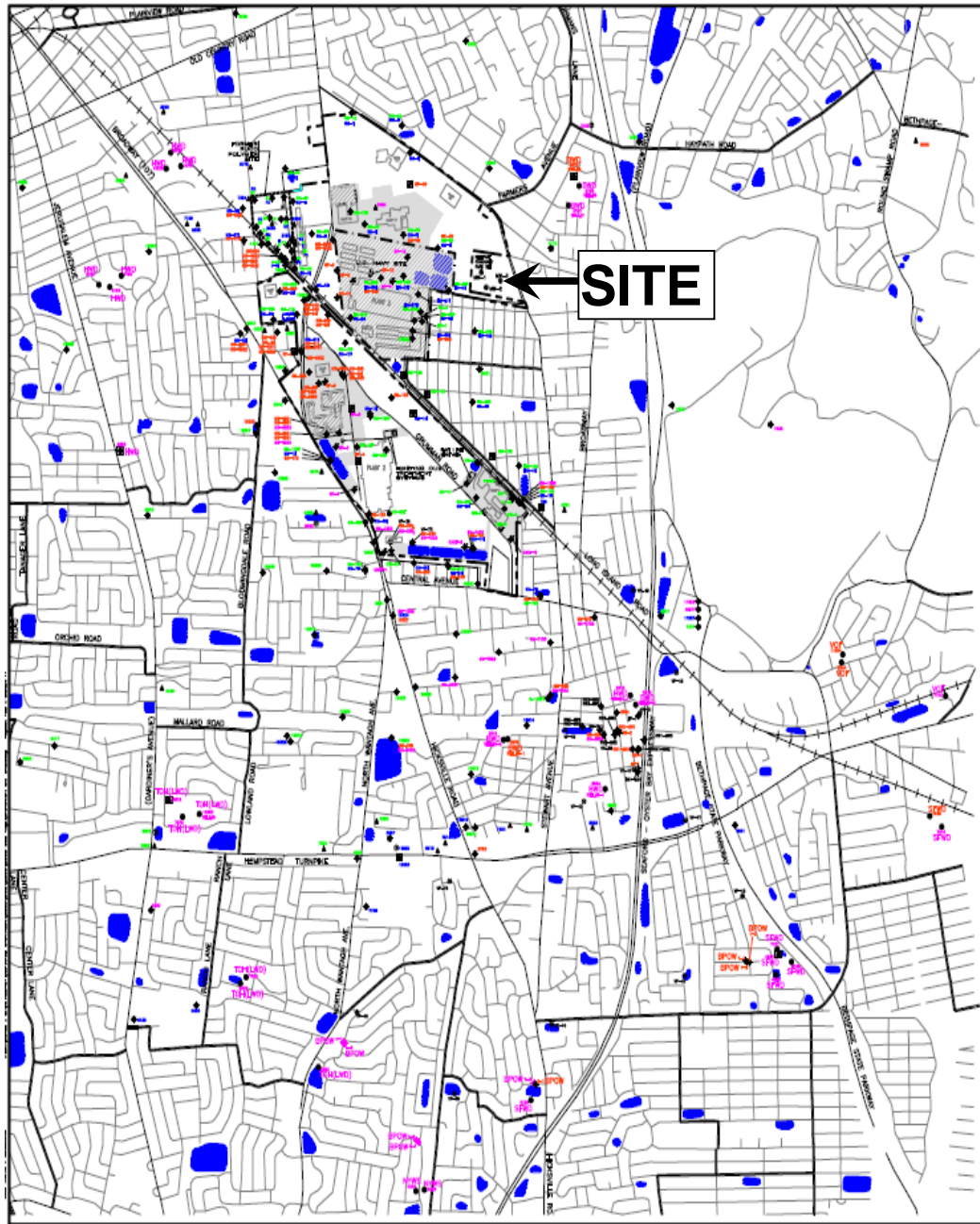
STATE OF NEW YORK
DEPARTMENT OF HEALTH

Why Are We Here Today?

- Northrop Grumman signed an Order on Consent (AOC) to investigate environmental conditions related to the Bethpage Community Park.
- The approved Remedial Investigation (RI) / Feasibility Study (FS) is currently being implemented, as follows:
 - RI field work has been completed in the Park and is continuing on adjacent Northrop Grumman property.
 - RI field work is ongoing in neighborhoods south of the Park
 - The RI Report for the Park is being prepared
- Northrop Grumman will implement two Interim Remedial Measures (IRMs) (soil gas and groundwater).
- The IRM Work Plan for soil gas has been approved by NYSDEC and the work is currently underway. The IRM Work Plan for groundwater is currently under development.
- The NYS-funded vapor intrusion study will be discussed.
- A chronology of work related to the Park will be provided today.
- Representatives of NYS are here to answer questions.

Parties Involved

- The NYS Department of Environmental Conservation (DEC), along with State and County Departments of Health (DOH) are the participating regulatory agencies.
- Northrop Grumman, the United States Navy, and the Town of Oyster Bay are the identified potentially responsible parties.
- This session focuses on work performed pursuant to the Northrop Grumman RI/FS Work Plan and the Soil Gas IRM Work Plan.



EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER RUCC POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUAMAN RESERVE SITE
- PROPERTY BOUNDARY OF U.S. NAVY SITE
- ▨ (DOTTED) NORTHROP GRUAMAN SPICED PROPERTY
- ▨ (SOLID) U.S. NAVY OWNED PROPERTY
- BASIN
- A INDUSTRIAL WELL
- B PUBLIC SUPPLY WELL
- C OBSERVATION MONITORING WELL
- D INFILTRATION WELL
- E UNKNOWN USE OF WELL
- F NORTHROP GRUAMAN OR NAVY PRODUCTION/MONITORING WELL ON OIL FIELD
- G EXISTING VERTICAL PROFILE BORING
- ABANDONED OR DESTROYED WELL
- H REVERSE FLOW MONITORING WELL (APPROXIMATE)
- I INFILTRATION WELL
- J SHALLOW WELLS
- K INTERMEDIATE WELLS
- L DEEP WELLS
- M DEEP 2 AND DEEP 3 WELLS
- SPWD SOUTH PARAMARCA WATER DISTRICT
- LWD LOSTON WATER DISTRICT
- NYWS NEW YORK WATER SERVICE
- MDA METRAC WATER DISTRICT
- TWN TOWN OF WESTPORT WATER DISTRICT
- MWD METSIBLIE WATER DISTRICT
- WVF VILLAGE OF PARAMARCA WATER DISTRICT
- VP VERTICAL PROFILE BORING

NOTES:

1. THIS FRAME DOES NOT INCLUDE ALL ACTIVE MONITORING AND OBSERVATION WELLS INSTALLED SINCE 1992.
2. THIS FRAME INCLUDES ALL SHALLOW WELLS INSTALLED IN FRAME 1+1 OF THE OUTLINE - 1000' BY 1000' PLUS SELECT ADDITIONAL MONITORING AND OBSERVATION WELLS.
3. THIS FRAME INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION REQUESTED BY ARCADIS IN SEPTEMBER 2001 LETTER.
4. THIS FRAME INCLUDES LOCATIONS OF VERTICAL PROFILE BORINGS INSTALLED BY THE US NAVY.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (BARSBILLE, METSIBLIE, WESTPORT, AND WESTPORT GRUAMAN), AND INFORMATION PROVIDED BY NORTHROP GRUAMAN.
6. NORTHROP GRUAMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN SEPTEMBER 2000.
7. LOCATION OF MONITORING WELLS INSTALLED BY OVRMA & INSTALLED AT PLANT 1 (I.E. 401-1 TO 401-4) ARE ESTIMATED FROM O&S SITE PLAN, PROVIDED ON FEBRUARY 14, 2002.
8. THIS FRAME INCLUDES LOCATIONS OF WELLS ASSOCIATED WITH THE OVRMA AREA INDUSTRIAL ACTON, PERFORMED BY THE NAVY.



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PROJECT NO.	REVISION	DATE

PROJECT TITLE
**NORTHROP GRUAMAN CORPORATION
 BETHPAGE, NEW YORK**

SHEET TITLE
**LOCATION OF NORTHROP GRUAMAN,
 U.S. NAVY & RUCC POLYMER SITES
 AND LOCATIONS OF WELLS**

ARCADIS

To: Kathryn Gombay
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PROJECT MANAGER	C. SAN GRUAMAN	DESIGNED BY	
LEAD DESIGNER	PHILIP	CHECKED BY	A. STEIN
DRAWING NUMBER	0001	DRAWN BY	A. SANJEEV
PROJECT NAME	NY001348	DWGNO. NAME	1

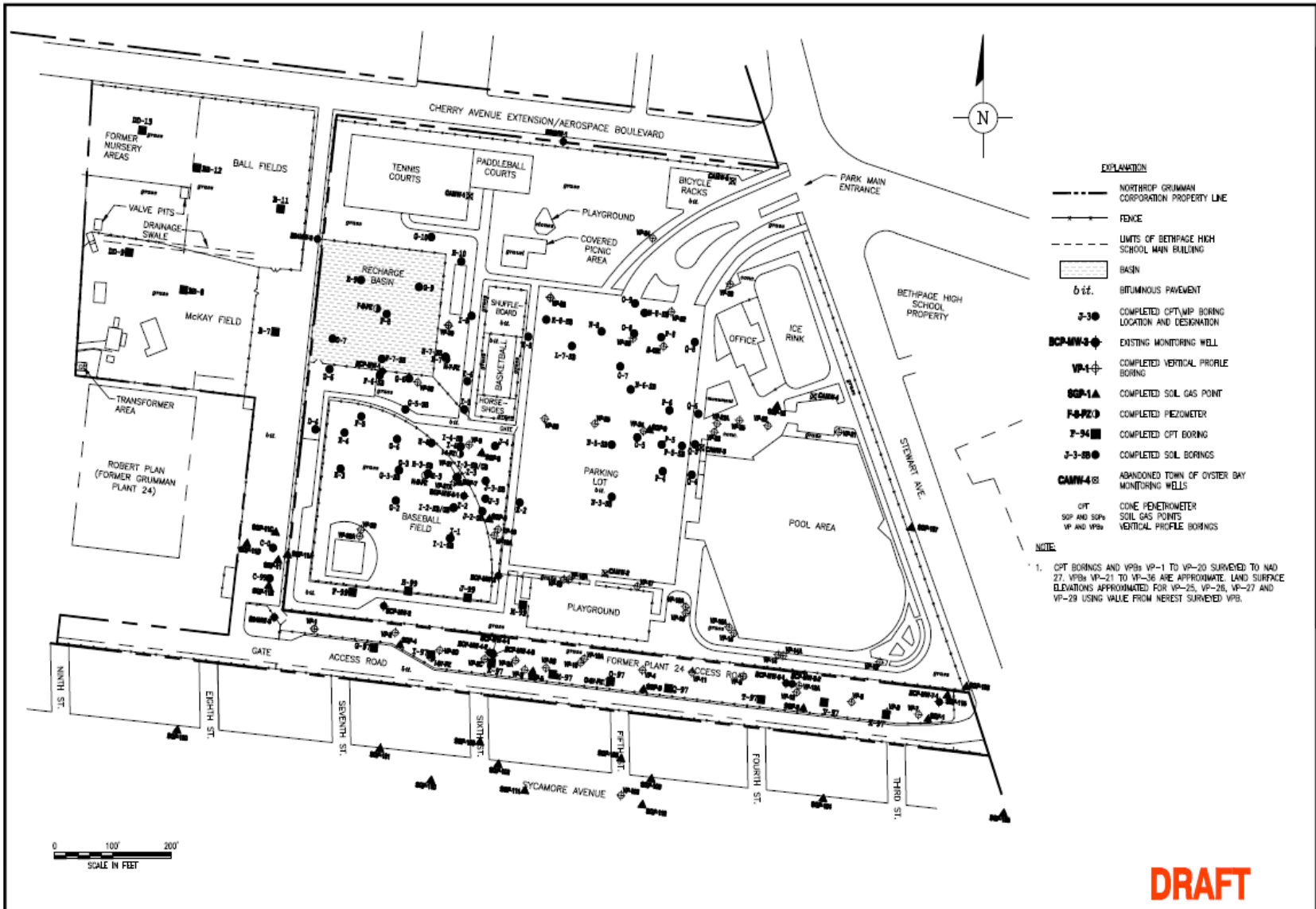
ALL COORDINATES REFERENCED TO NAD83/NAIP/USNG DATUM



Project Area – December 2004

Key Dates

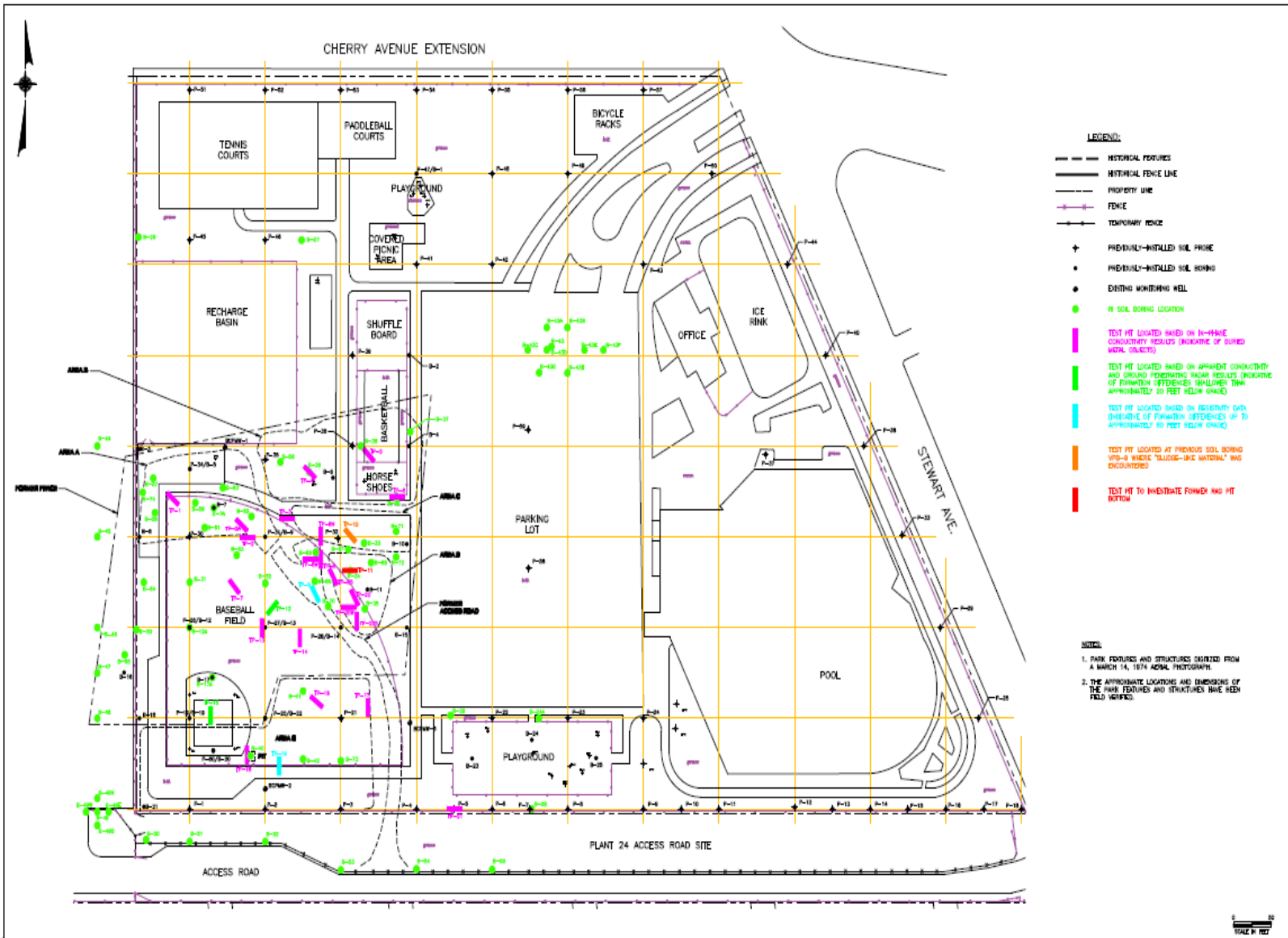
- 2004: NYSDEC designates Bethpage Park as Operable Unit 3 (OU3)
- July 2004 – June 2005: Phase 1 of the RI performed pre-Administrative Order on Consent (AOC)
- June 2005: OU3 AOC signed
- August 2005: Draft RI/FS Work Plan
- March 2006: Final RI/FS Work Plan
- April to December 2006: Phase 2 RI
- January 2007 to present: Phase 3 RI
- February 2007: Soil Gas IRM Work Plan



- EXPLANATION**
- NORTHROP GRUMMAN CORPORATION PROPERTY LINE
 - FENCE
 - LIMITS OF BETHPAGE HIGH SCHOOL MAIN BUILDING
 - ▭ BASIN
 - bit. BITUMINOUS PAVEMENT
 - 30 COMPLETED CPT/VP BORING LOCATION AND DESIGNATION
 - ◆ BCP-MW-4 EXISTING MONITORING WELL
 - ⊕ VP-1 COMPLETED VERTICAL PROFILE BORING
 - ▲ SGP-1A COMPLETED SOIL GAS POINT
 - F&PZ-1 COMPLETED PIEZOMETER
 - T-34 COMPLETED CPT BORING
 - J-3-25 COMPLETED SOIL BORINGS
 - ⊠ CAMW-4 ABANDONED TOWN OF OYSTER BAY MONITORING WELLS
 - CPT
 - SGP AND SGP
 - VP AND VP
- NOTE**
- CPT BORINGS AND VPS VP-1 TO VP-20 SURVEYED TO NAD 27. VPS VP-21 TO VP-36 ARE APPROXIMATE. LAND SURFACE ELEVATIONS APPROXIMATED FOR VP-25, VP-26, VP-27 AND VP-29 USING VALUE FROM NEAREST SURVEYED VPS.

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© 2007 ARCADIS OF NEW YORK, INC.									
	NO. ISSUED	DATE	REVISION DESCRIPTION	BY/CHK	SEAL				
					PROJECT TITLE OPERABLE UNIT 3 FORMER GRUMMAN SETTLING PONDS BETHPAGE, NEW YORK				
PROJECT MANAGER C. SAN GIOVANNI			DEPARTMENT MANAGER M. WOLFERT			LEAD DESIGN PROF. D. STERN		CHECKED BY D. STERN	
SHEET TITLE SITE PLAN SHOWING COMPLETED SAMPLE LOCATIONS					TASK/PHASE NUMBER 00002		DRAWN BY A. SANCHEZ		2
PROJECT NUMBER NY001464.1007					FIGURE				



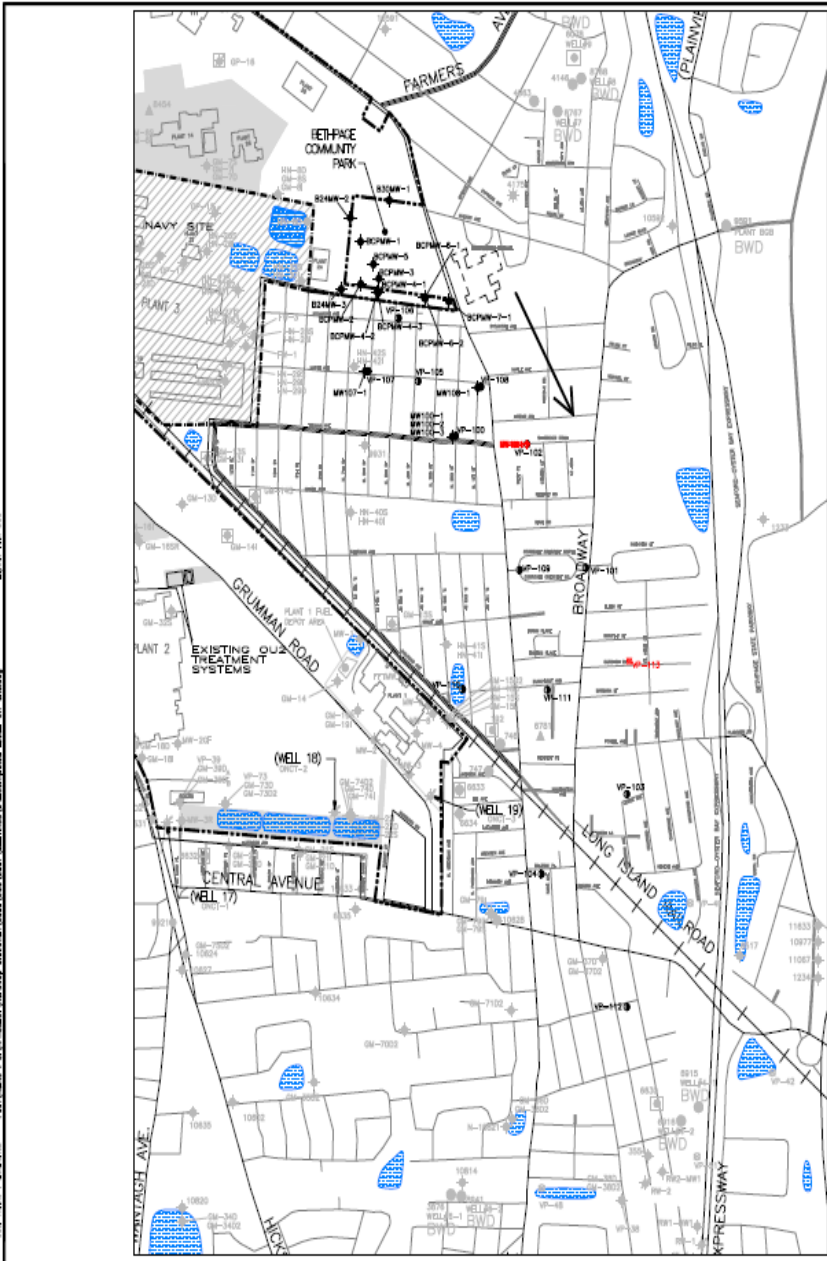
- LEGEND:**
- HISTORICAL FEATURES
 - HISTORICAL FENCE LINE
 - PROPERTY LINE
 - FENCE
 - TEMPORARY FENCE
 - + PREVIOUSLY-INSTALLED SOIL PRUNE
 - PREVIOUSLY-INSTALLED SOIL BORING
 - EXISTING MONITORING WELL
 - IN SOIL BORING LOCATION
 - TEST PIT LOCATED BASED ON IN-HOUSE CONDUCTIVITY RESULTS (INDICATIVE OF BURIED METAL OBJECTS)
 - TEST PIT LOCATED BASED ON APPARENT CONDUCTIVITY AND GROUND PENETRATING RADAR RESULTS (INDICATIVE OF FOUNDATION DIFFERENCES (SHALLOWER THAN APPROXIMATELY 20 FEET BELOW GROUND))
 - TEST PIT LOCATED BASED ON RESISTIVITY DATA (INDICATIVE OF FOUNDATION SETTLED UP TO APPROXIMATELY 40 FEET BELOW GROUND)
 - TEST PIT LOCATED AT PREVIOUS SOIL BORING VIB-3 SINCE "SLUDGE-LIKE MATERIAL" WAS ENCOUNTERED
 - TEST PIT TO INVESTIGATE FENCED HAD HIT BOTTOM

- NOTES:**
1. PARK FEATURES AND STRUCTURES DERIVED FROM A MARCH 14, 1974 AERIAL PHOTOGRAPH.
 2. THE APPROXIMATE LOCATIONS AND DIMENSIONS OF THE PARK FEATURES AND STRUCTURES HAVE BEEN FIELD VERIFIED.



REMEDIAL INVESTIGATION PROGRAM - PHASE 2A
SOIL BORING AND TEST PIT LOCATIONS

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- LEGEND**
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
 - PROPERTY BOUNDARY OF U.S. NAVY SITE
 - LONG ISLAND RAILROAD
 - INDICATES NORTHROP GRUMMAN OWNED PROPERTY
 - ▨ INDICATES U.S. NAVY OWNED PROPERTY (AS OF 2003)
 - BETHPAGE AERONAUTICAL CENTER
 - LIMITS OF BETHPAGE HIGH SCHOOL MAIN BUILDING
 - OBSERVATION, MONITORING WELL (GRAY - SHOWN FOR REFERENCE) (BLACK - PROPOSED TO BE SAMPLED IN PHASE 2 R)
 - MINUTEMAN WELL
 - PUBLIC SUPPLY WELL
 - IRRIGATION WELL
 - NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
 - ABANDONED PRODUCTION WELL
 - COMPLETED OUS VERTICAL PROFILE BORING
 - COMPLETED OUS VERTICAL PROFILE BORING
 - PROPOSED OUS VERTICAL PROFILE BORING
 - PROPOSED OUS CONTINGENCY VERTICAL PROFILE BORING
 - COMPLETED MONITORING WELLS
 - PROPOSED MONITORING WELLS
 - BETHPAGE WATER DISTRICT
 - VERTICAL PROFILE BORING
 - REMEDIAL INVESTIGATION
 - OPERABLE UNIT 2
 - OPERABLE UNIT 3
 - ← GENERAL AERIAL GROUNDWATER FLOW DIRECTION

- GENERAL NOTES:**
1. THIS PLAN INDICATES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION RECEIVED BY ARCADIS IN RESPONSE TO A SEPTEMBER 2001 LETTER TO WATER DISTRICTS.
 2. BORING LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (BOSTON, MIDDLESEX, FREDRICK AND ANNEVILLE QUADRANGLES) AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
 3. NORTHROP GRUMMAN PROPERTY BOUNDARIES BASED ON DATA PROVIDED IN JUNE 2002.
 4. LOCATIONS OF MONITORING WELLS INSTALLED BY DYWIDAG & SHANTALECCI (DWS) AT PLANT 1 (I.e., MW-1 TO MW-4) ARE APPROXIMATE BASED ON 04B SITE PLAN, PROVIDED ON DECEMBER 14, 2002.
 5. LOCATIONS OF MONITORING WELLS INSTALLED BY DYWIDAG & SHANTALECCI (DWS) AT BETHPAGE COMMUNITY PARK ARE APPROXIMATE BASED ON DATA PROVIDED BY 04B SITE PLAN, DATED DECEMBER 2002.



ALL COORDINATES REFERENCED TO NAD83 ARCADIS DATUM

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DATE	ISSUE	NO.
11/08/07	ISSUE FOR RFP	01
01/08/08	ISSUE FOR RFP	02

PROJECT TITLE

OPERABLE UNIT 3
NORTHROP GRUMMAN
SYSTEMS CORPORATION
BETHPAGE, NEW YORK

PROJECT FILE

SITE PLAN
SHOWING OFF-SITE
MONITORING WELLS AND
VERTICAL PROFILE BORINGS



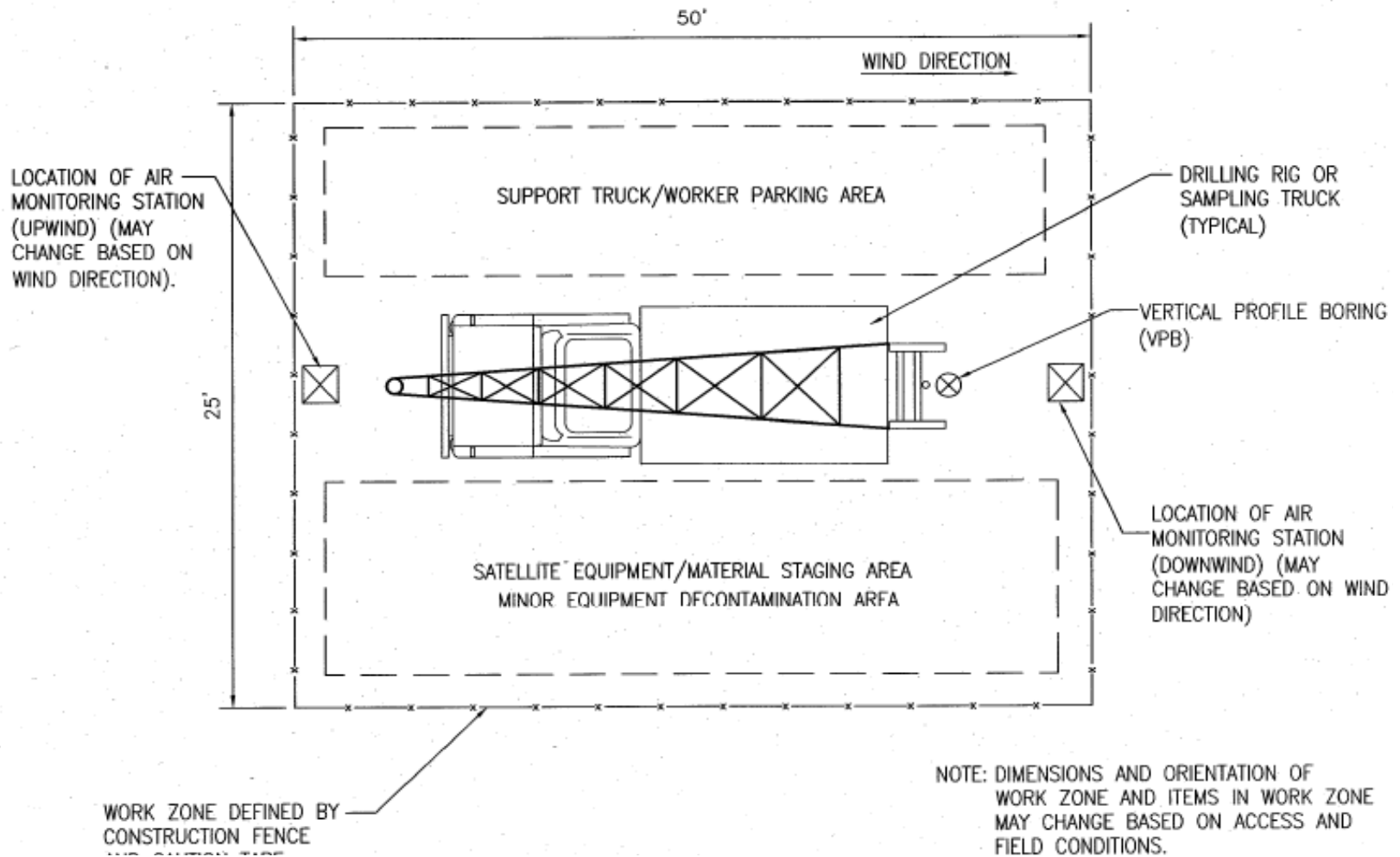
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PROJECT MANAGER	DATE/TIME MANAGER
C. SAN JOSEPH	M. KELLEY
LEAD DESIGN PROFESSIONAL	CHECKED BY
M. KELLEY	A. SANJEEV
PROJECT NUMBER	PROJECT
NY001464.1007	4

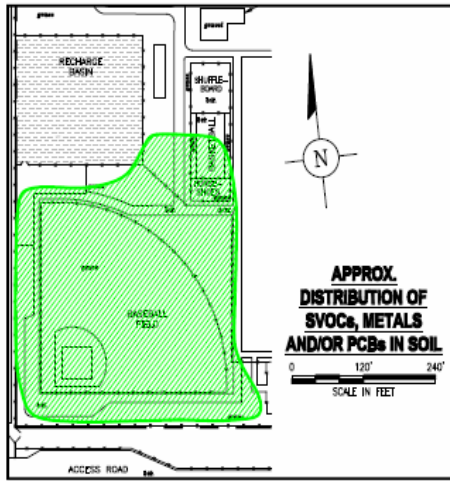
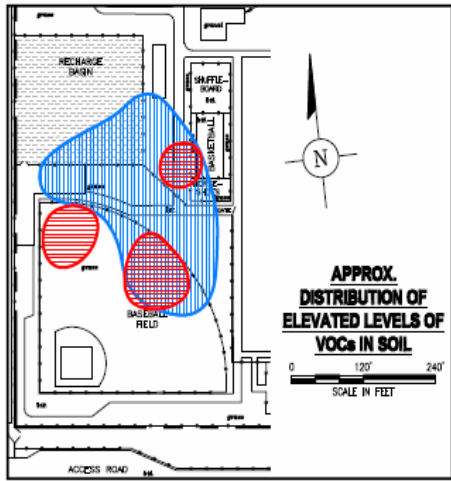
Summary of RI (On- and Off-Site)

Type of Work	Media Investigated	Number of Locations	Contaminants Tested
Soil Borings	Soil	354	VOC, SVOC, Metals, PCB
Surface Geophysics	Buried Features	Continuous Grid	NA
Test Pits	Soil	21	VOC, Metals, PCB
Cone Penetrometer/ Membrane Interface Borings	Soil, Perched Water	49	VOC
Piezometers	Perched Water	6	VOC, Metals
Vertical Profile Borings, Shallow	Groundwater, Limited Soil	63	VOC, SVOC, perchlorate
Vertical Profile Borings, Deep	Groundwater	8	VOC, perchlorate
Ambient Air Samples	Ambient Air	4	VOC
Soil Gas Points	Soil Gas	36	VOC
Monitoring Wells	Groundwater	12	TBD

Figure 5. Typical Off-Site RI Operations Footprint



SOUTHWESTERN PORTION OF BETHPAGE COMMUNITY PARK

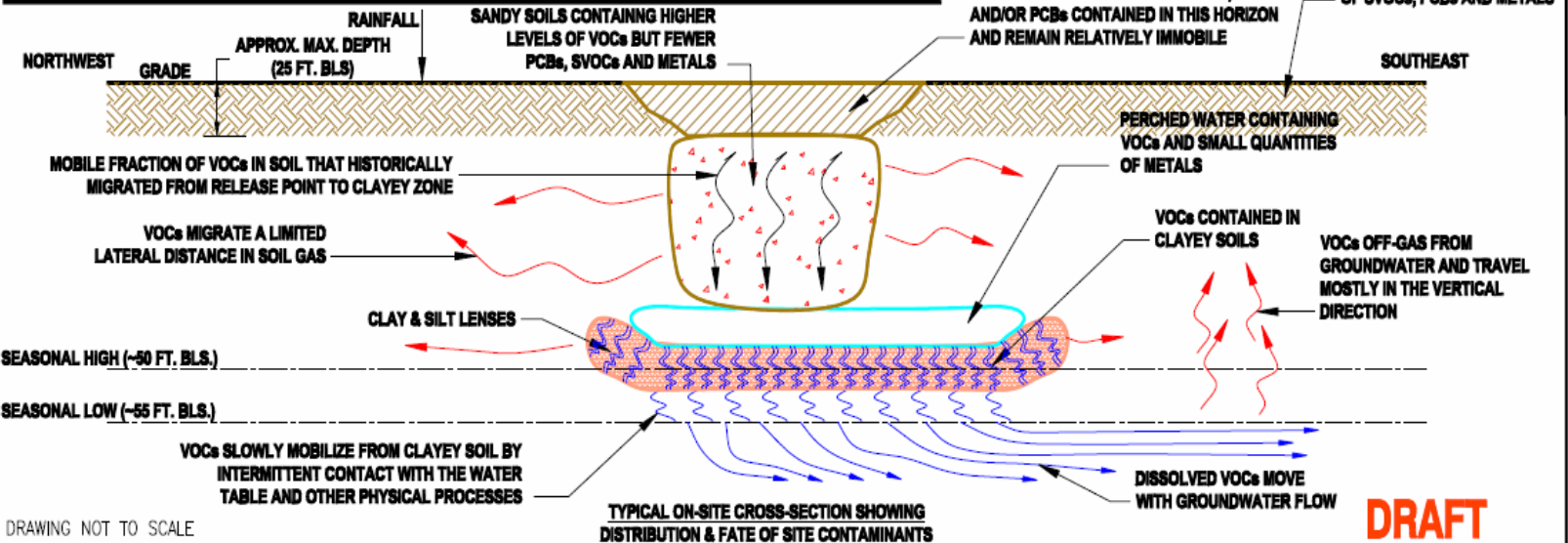


EXPLANATION

- NORTHROP GRUMMAN CORPORATION PROPERTY LINE
- FENCE
- BASIN
- 0.5" BITUMINOUS PAVEMENT
- VOCs NEAR LAND SURFACE (APPROX. 0-25 FT. BLS.)
- VOCs NEAR WATER TABLE IN CLAYEY ZONES (APPROX. 30-55 FT. BLS.)
- SVOCs, METALS AND PCBs DETECTED NEAR LAND SURFACE (APPROX. 0-25 FT. BLS.)

NOTES:

- THIS FIGURE IS QUALITATIVE IN NATURE AND IS NOT INTENDED TO CONVEY QUANTITATIVE INTERPRETATION OF SAMPLE RESULTS.
- ALL AREAS OF CONCERN IN PARK NOT SHOWN



NO.	ISSUED DATE	REVISION DESCRIPTION	BY/DO
1	6-27-07	NYSED: PUBLIC MEETING	DES

SEAL

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

PROJECT MANAGER
C. SAN GIOVANNI

DEPARTMENT MANAGER
M. WOLFERT

SHEET TITLE
CONCEPTUAL SITE MODEL

LEAD DESIGN PROF.

TASK/PHASE NUMBER
00002

PROJECT NUMBER
NY001464.1007

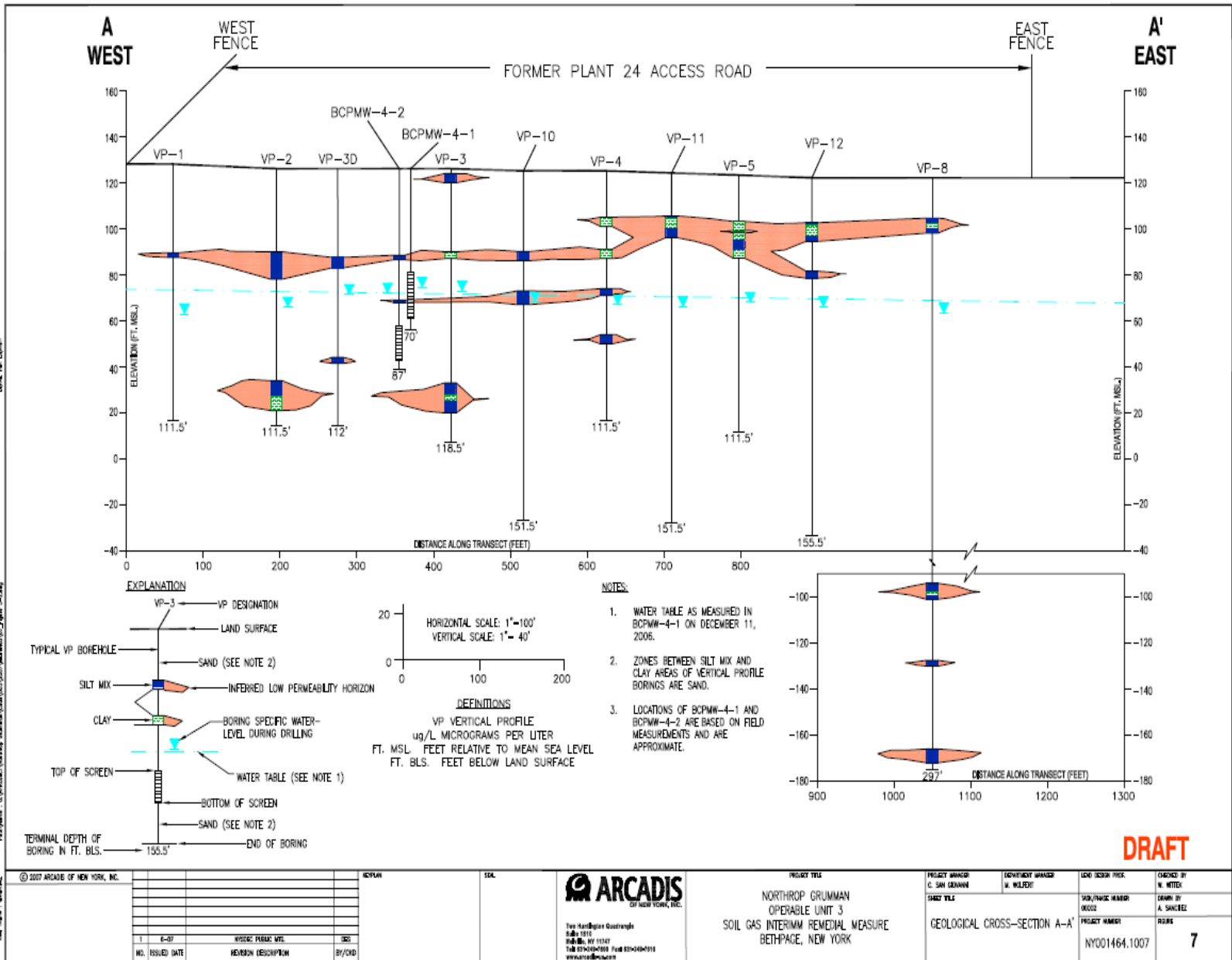
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M. RENOL

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A. SANCHEZ

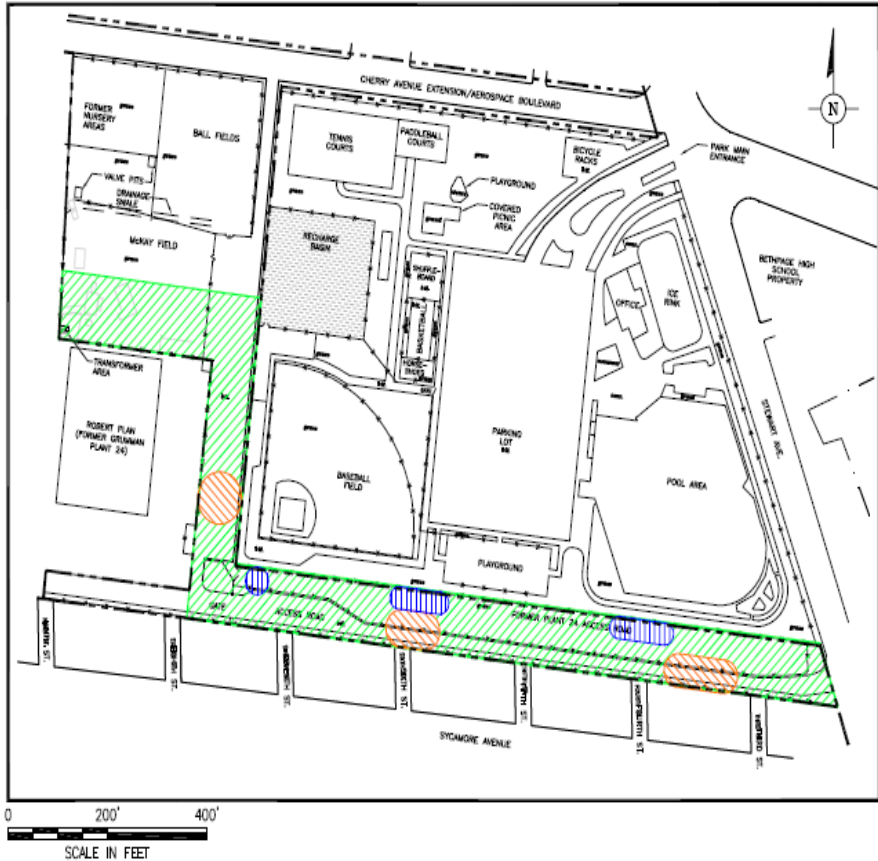
FIGURE
6

Soil Gas Interim Remedial Measure

- Objective:
 - Prevent off-site migration of VOCs in soil gas
- System components:
 - Depressurization/Monitoring Wells
 - Below-Grade Piping
 - Equipment Building (Blower/Electrical Systems)
 - Emissions Control (Vapor Treatment)



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						NORTHROP GRUMMAN OPERABLE UNIT 3 SOIL GAS INTERIM REMEDIAL MEASURE BETHPAGE, NEW YORK	C. SAN GIOVANNI	M. WILFERT		W. NITEX
						SHEET TITLE GEOLOGICAL CROSS-SECTION A-A'			DRAWN BY A. SANCHEZ	
									PROJECT NUMBER NY001464.1007	
									REVISION 7	

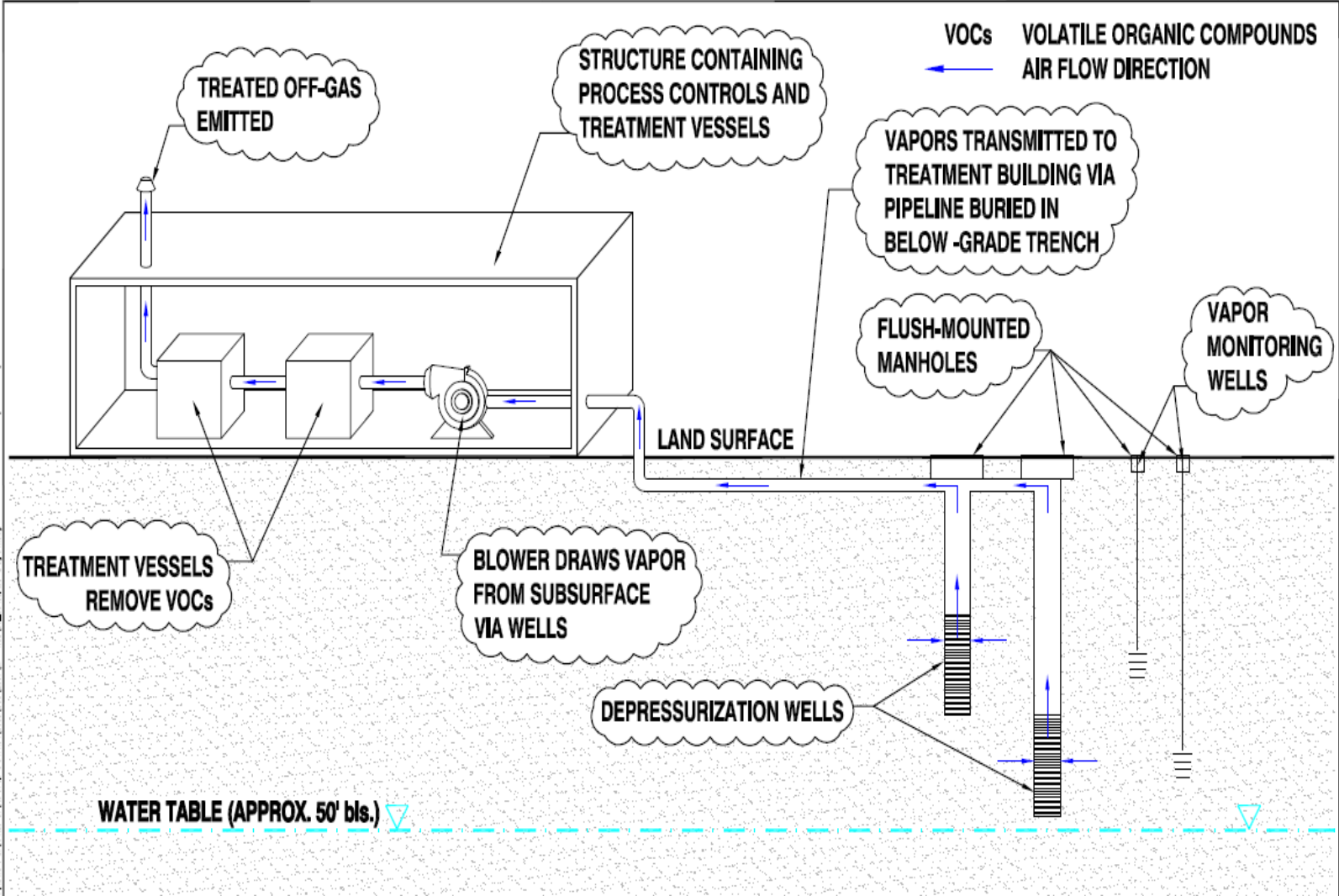


EXPLANATION:

- NORTHROP GRUMMAN PROPERTY LINE
- x-x- FENCE
- - - - - LIMITS OF BETHPAGE HIGH SCHOOL MAIN BUILDING
- 0.6" BITUMINOUS PAVEMENT
- [Green hatched box] PROPOSED LOCATION OF GROUNDWATER & SOIL GAS INTERIM REMEDIAL MEASURE SYSTEMS
- [Orange hatched box] SOIL GAS PILOT STUDY LOCATION
- [Blue hatched box] GROUNDWATER BENCH SCALE/TREATABILITY STUDY SAMPLE COLLECTION LOCATION

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1	E-07	NYSDC PERMITS UNIT	DATE			<p>PROJECT TITLE</p> <p>PROPOSED LOCATION OF INTERIM REMEDIAL MEASURE SYSTEMS</p>	<p>NO. / DATE</p> <p>NO. / DATE</p>	<p>PROJECT NUMBER</p> <p>NY001464.1007</p>	<p>DRAWN BY</p> <p>A. SANCHEZ</p>



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NO.	ISSUED DATE	REVISION DESCRIPTION	BY/CHKD						
1	6-07	HYDRO PUMPING WELLS	SDS						

Groundwater Interim Remedial Measure

- Objectives:
 - Minimize off-site migration of VOCs in groundwater
 - Create/enhance VOC-free water-table lens south of Park
- Options Under Consideration:
 - Groundwater Pump & Treat
 - Enhanced Biodegradation
 - Reactive Barrier
 - Chemical Oxidation

Estimated Project Schedule

- On-Site
 - RI Field Work: Completed
 - Soil Gas IRM Startup: October 2007
 - RI Report: October 2007
 - Feasibility Study: December 2007
 - Groundwater IRM Startup: October 2008
- Off-Site
 - RI Field Work: First Quarter 2008
 - RI Report: June 2008
 - Feasibility Study: September 2008
- Additional Public Meetings: To Be Determined

Contact Information

In case of project questions or concerns, please contact the NYSDEC:

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Project Manager

NYSDEC

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William Fonda

Citizen Participation Specialist

NYSDEC

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Ms. Jacqueline Nealon

New York State Department of Health

Main Office: (518) 402-7870

E-mail: Jen02@health.state.ny.us

Contact Information

If you wish to contact Northrop Grumman directly, please contact:

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