



Groundwater Remediation Project

Naval Weapons Industrial Reserve Plant

Bethpage, NY

GM-38 Area

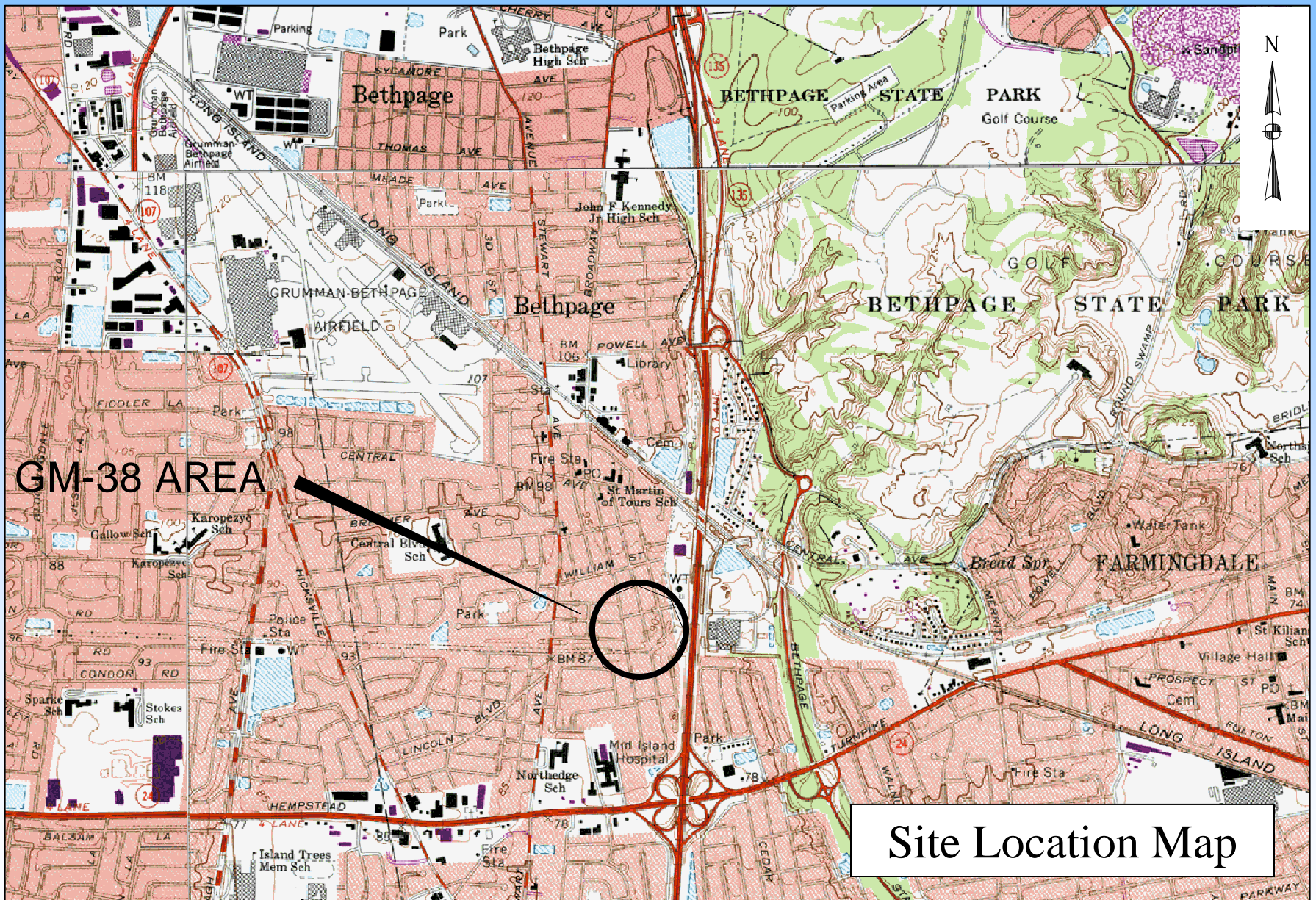
Restoration Advisory Board Meeting

June 7, 2006



TETRA TECH EC, INC.





GM-38 AREA

Site Location Map

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Groundwater Remediation Project

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Site History

- Chlorinated solvents detected in GW
- GW pump & treat system installed on Northrop Grumman property (Nov 1998)
- GM-38 Area delineated (June 2000-April 2002)
- Conceptual Plans to design and build GWTP in GM-38 Area for mass removal (February 2003)

Site History (cont'd)

- Community Workshop (September 2004)
- Pre-design investigation (November 2004)
- Draft Remedial Design (February 2005)
 - Reviewed by Navy and Third Party Consultant
- 90% Draft Final Design (November 2005)
 - Reviewed by same plus NYS DEC, TOB, and public
- Final Design (May 2006)

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Treatment System Design (cont'd)

- Mass Removal of Volatile Organic Compounds (VOC's) from groundwater
- Process Flow Rate = 1,100 gallons / minute
- Pumping from two recovery wells
- Primary treatment is Air Stripping
- Secondary treatment (polish) is Carbon Media
- Vapors from Air Stripping Treated w/ Carbon
- Inject treated water into four injection wells



- NOTES:**
1. SANITARY SEWER MANHOLE LOCATIONS AND RM ELEVATIONS ARE AS PER L.K. MULLAN ASSOCIATES' FIELD DATA EXCEPT WHERE OTHERWISE NOTED. ALL LEGAL PIPE ALLEGES (WHERE SHOWN) ARE AS PER NASSAU COUNTY SANITARY SEWER RECORD PLANS.
 2. THE LOCATION OF OVERHEAD AND UNDERGROUND ELECTRIC LINES SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY NYS DPW.
 3. THE LOCATION OF GAS MAINS SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY NYS DPW.
 4. THE LOCATION OF WATER MAINS SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY THE BETHPAGE WATER DISTRICT.
 5. STORM SEWER DRAINAGE MANHOLE LOCATIONS, CATCH BASIN LOCATIONS AND RM ELEVATIONS ARE AS PER L.K. MULLAN ASSOCIATES' FIELD DATA EXCEPT WHERE OTHERWISE NOTED.
 6. THE LOCATION OF THE DRAINAGE (STORM SEWER) PIPES ON SONOMA STREET HAVE NOT BEEN ESTABLISHED. THERE IS NO DATA ON RECORD AT THE TOWN OF OYSTER BAY DEPARTMENT OF PUBLIC WORKS.
 7. MEASUREMENTS ARE IN ACCORDANCE WITH U.S. STANDARDS.
 8. COORDINATES AND BEARINGS SHOWN ARE IN LONG ISLAND ZONE OF THE NEW YORK STATE PLANE COORDINATE SYSTEM HAD 1983. ELEVATIONS REFER TO NAVD 1983.
 9. UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7206, SUBDIVISION 2, OF NEW YORK STATE EDUCATION LAW.
 10. ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S "EMBOSSER" SEAL OR "WAXED" SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES.
 11. CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LEGAL INSTRUMENT TO WHICH, AND TO THE ASSIGNEES OF THE LEGAL INSTRUMENT, CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
 12. RIGHTS-OF-WAY NOT SHOWN ARE NOT CERTIFIED.
 13. FOUR INJECTION WELLS POSTED 80 FEET APART ARE EACH PREDICTED TO HANDLE SUBSURFACE INJECTION FLOW RATES OF 275 GALLONS PER MINUTE (GPM) FOR A CUMULATIVE FLOW OF 1,100 GPM. NUMBER OF INJECTION WELLS AND SCHEDULING SCHEDULES UPON PROXIMATE MODEL RESULTS PRESENTED BY TERA TECH NUS, INC. IN THE "GROUNDWATER REMEDIATION ANALYSIS REPORT" DATED FEBRUARY 2003.
 14. LINES IDENTIFIED ON THIS DRAWING AS PART OF THIS PROJECT ILLUSTRATE APPROXIMATE AND DO NOT REPRESENT ACTUAL PIPE/PIPE SIZES OR TRENCH WIDTHS.
 15. TEMPORARY ACCESS ROAD ENTRANCE FROM BROADWAY AVE. SHALL INCLUDE 20 FT. CURB CUT FOR INSTALLATION OF CONCRETE DRAINWAY APRON (PERMIT REQUIRED).
 16. SANITARY LINE SHALL MAINTAIN 1-2% SLOPE FROM BUILDING TO THE DESIGNATED MANHOLE CONNECTION INTO MANHOLE 100. BE A MINIMUM OF 30" BELOW MANHOLE RM ELEVATION. SEWER CONNECTIONS PERMIT REQUIRED FROM NASSAU COUNTY AND NASSAU COUNTY DEPT. OF PUBLIC WORKS PRIOR TO WORK INITIATION.
 17. ELECTRICAL AND TELEPHONE TE-IN CONNECTIONS ARE AT POLE LPA (FORMALLY L.T.L.) #18.
 18. POTABLE WATER LINE TE-IN LOCATION SHALL BE ON THE EASTERN SIDE OF THE FUTURE PERMANENT ACCESS ROAD TO THE TREATMENT BUILDING. WATER METER 70" SHALL BE LOCATED ADJACENT TO THE ACCESS ROAD ENTRANCE AT SONOMA STREET. A RECOVERY ZONE DEVICE SHALL BE LOCATED COMPOSITE OF WATER PIT IN AN ADVISORY SHAFT. PLANS AND APPLICATIONS MUST BE APPROVED BY THE HEALTH DISTRICT AND NASSAU COUNTY DEPT. OF HEALTH PRIOR TO INSTALL.
 19. THE RM-2 EFFLUENT PIPING TRENCH SHALL ALSO CONTAIN A DOUBLE WALLED 12" DIA. (MAX) X 8" H. GALVNEV. HDPE PIPE FOR POTENTIAL FUTURE WELL CONNECTION AND A 10" DIA. HDPE PIPE FOR POTENTIAL FUTURE ALTERNATE DISCHARGE POINT. BOTH PIPES FOR POTENTIAL FUTURE USE SHALL BE BRAND FLANGED AND INSIDE A TERMINATION WALK.

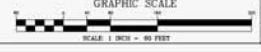
- LEGEND:**
- EXISTING GRADE-MAJOR CONTOUR
 - EXISTING GRADE-MAJOR CONTOUR
 - PROPOSED GRADE
 - TAX LOT LINE
 - OVERHEAD ELECTRIC WIRES
 - UNDERGROUND ELECTRIC WIRES
 - WATER MAIN
 - GAS MAIN
 - DRAINAGE LINES (STORM SEWER)
 - SANITARY SEWER MAIN
 - WOODED AREA
 - CHAIN-LINK OR BOARD FENCE
 - DIRT TRAIL
 - LINES OF CLEARING
 - SALT FENCE
 - NEW UNDERGROUND ELECTRIC WIRES
 - NEW WATER LINE
 - NEW SANITARY SEWER MAIN
 - HDPE PIPE AND ELECTRICAL CONDUIT
 - TAX LOT NUMBER
 - WATER VALVE
 - GAS VALVE
 - MONITORING WELL
 - RECOVERY WELL
 - INJECTION WELL
 - PULL BOX
 - LEAK DETECTION ACCESS POINT
 - EXISTING DECIDUOUS TREE
 - EXISTING CONIFEROUS TREE
 - WHITE PINE TREE LOCATION
 - SIGN
 - MANHOLE
 - GRAVEL
 - TEMPORARY ACCESS ROAD

REFERENCE:
 L.K. MULLAN ASSOCIATES, P.C.
 437 50 COUNTRY ROAD, BROOKHAVEN, NY
 TOPOGRAPHIC SUBJECT: NASSAU HEADQUARTERS INDUSTRIAL RESERVE PLANT,
 DN-38 AREA, FILE # 04033.000
 AUGUST 2, 2004

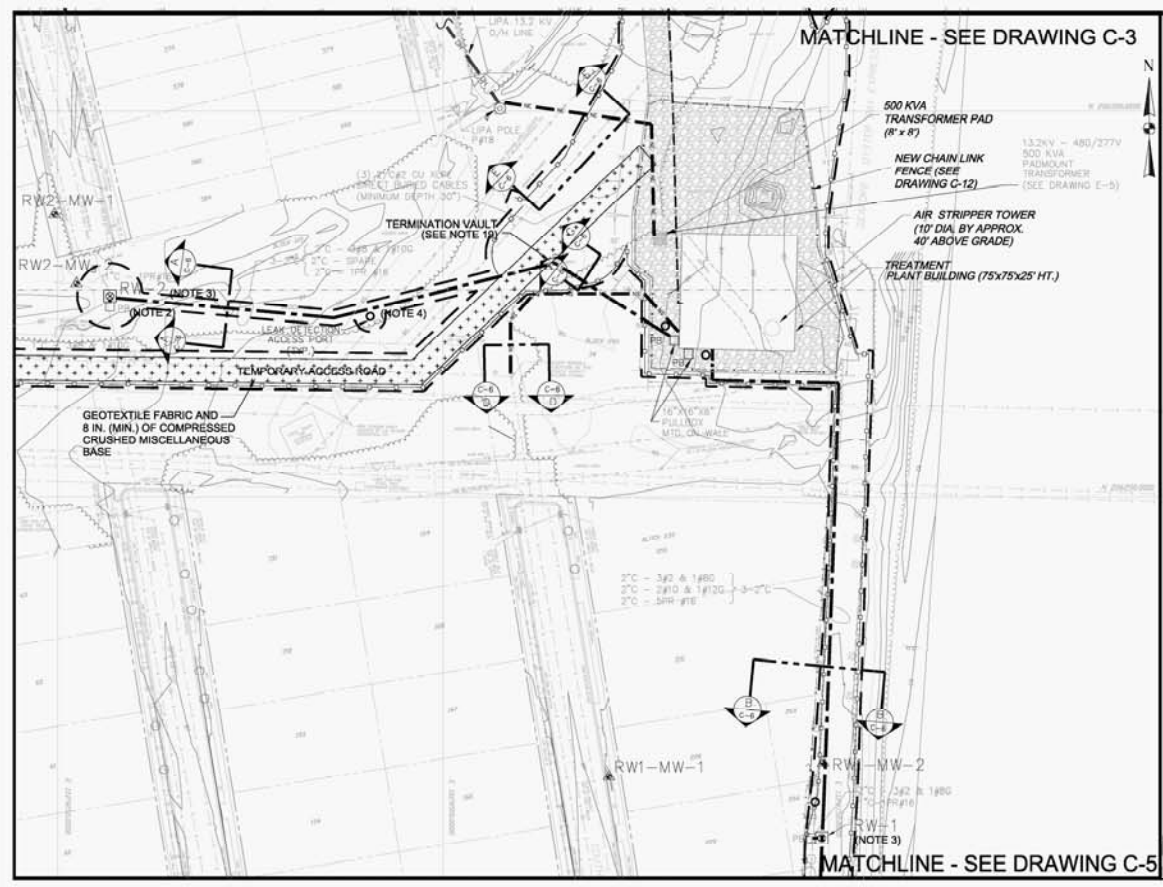
DATE	DESCRIPTION	BY	APP'D BY
08/24/04	ENGINEERING FIELD ACTIVITY - NORTH EAST DN-38 AREA CONDUIT/TREATMENT PLANT PIPING AND UTILITY SET LAYOUT	J. CHIU	J. CHIU
08/24/04			
08/24/04			
08/24/04			
08/24/04			
08/24/04			



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 Plot Size: 11.00 x 11.00
 Plot Title: 2021-057.dwg
 Plot Date: 08/24/2024 10:58:24 AM
 User: [redacted]



- NOTES**
- SEE NOTES ON DRAWING C-3.
 - FOR CONCRETE PULL BOX SEE DETAIL 1 ON DRAWING E-4.
 - FOR RECOVERY WELL CONSTRUCTION DETAILS, SEE DETAIL 1 ON DRAWING E-15.
 - FOR LEAK DETECTION ACCESS PORT DETAILS, SEE DETAIL 5 ON DRAWING E-12.

REFERENCE:
 L. K. MALKIN ASSOCIATES, P.C.
 437 5th COURTYARD ROAD, BRIDGEVILLE, PA
 15005-0406
 PH: 412.731.1000
 FAX: 412.731.1001
 AUGUST 2, 2024

- LEGEND:**
- - - - - EXISTING GRADE - MAJOR CONTOUR
 - - - - - EXISTING GRADE - MINOR CONTOUR
 - - - - - PROPOSED GRADE
 - - - - - TAX LOT LINE
 - - - - - DOWNSIDE ELECTRIC WIRES
 - - - - - UNDERGROUND ELECTRIC WIRES
 - - - - - WATER MAIN
 - - - - - GAS MAIN
 - - - - - DRAINAGE LINES (SHOW SINK)
 - - - - - SANITARY SEWER MAIN
 - - - - - WOODED AREA
 - - - - - CHAIN-LINK OR WOOD FENCE
 - - - - - SWFT TRAIL
 - - - - - LIMITS OF CLEARING
 - - - - - BELT FENCE
 - - - - - NEW UNDERGROUND ELECTRIC WIRES
 - - - - - NEW WATER LINE
 - - - - - NEW SANITARY SEWER MAIN
 - - - - - GOLF PIPE AND ELECTRICAL CONDUIT
 - - - - - TAX LOT NUMBER
 - - - - - WATER VALVE
 - - - - - GAS VALVE
 - - - - - MONITORING WELL
 - - - - - RECOVERY WELL
 - - - - - INJECTION WELL
 - - - - - PULL BOX
 - - - - - LEAK DETECTION ACCESS PORT
 - - - - - EXISTING DECIDUOUS TREE
 - - - - - EXISTING CONIFEROUS TREE
 - - - - - WHITE PINE TREE LOCATION
 - - - - - SIGN
 - - - - - MARKER
 - - - - - GRAVEL
 - - - - - TEMPORARY ACCESS ROAD
 - - - - - PUBLIC WATER SUPPLY WELL



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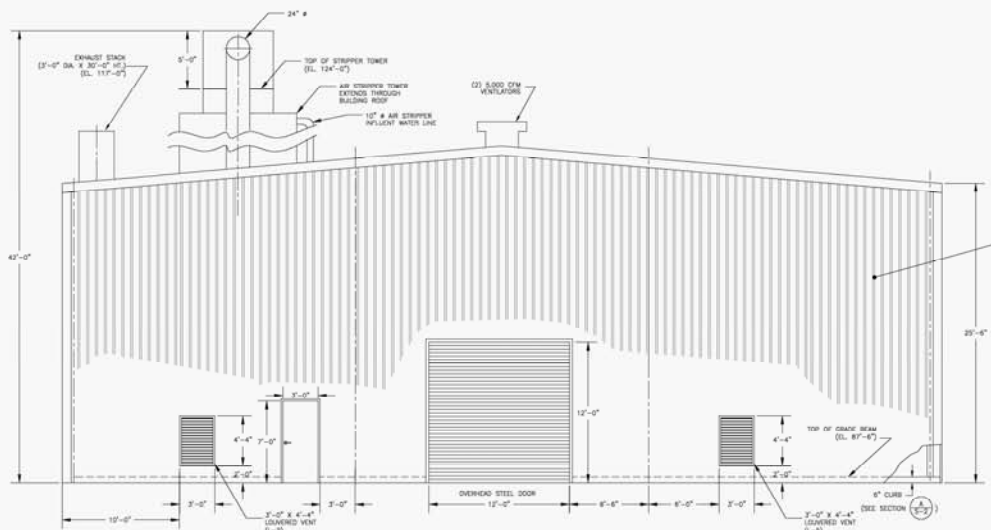
IF IT IS A VIOLATION OF THE NEW YORK STATE PROFESSIONAL SEAL ACT, THE SEAL SHOULD BE VOIDED UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER TO ALTER OR SIGN ON THIS DOCUMENT IN ANY MANNER.

DATE: 08/24/2024	TIME: 10:58:24 AM	USER: [redacted]
PROJECT: ENGINEERS FIELD ACTIVITY - NORTHEAST	DRAWING NO: 2021-057 (SHEET 2 OF 3)	DRAWING DATE: 08/24/2024
<p style="text-align: center;">ENGINEERS FIELD ACTIVITY - NORTHEAST</p> <p style="text-align: center;">DU-36 AREA</p> <p style="text-align: center;">RECOVERY PITS</p> <p style="text-align: center;">PIPING AND UTILITY ROUTE DETAIL (SHEET 2 OF 3)</p>		
SCALE: 1" = 50'	SHEET: C-4	TOTAL SHEETS: 3

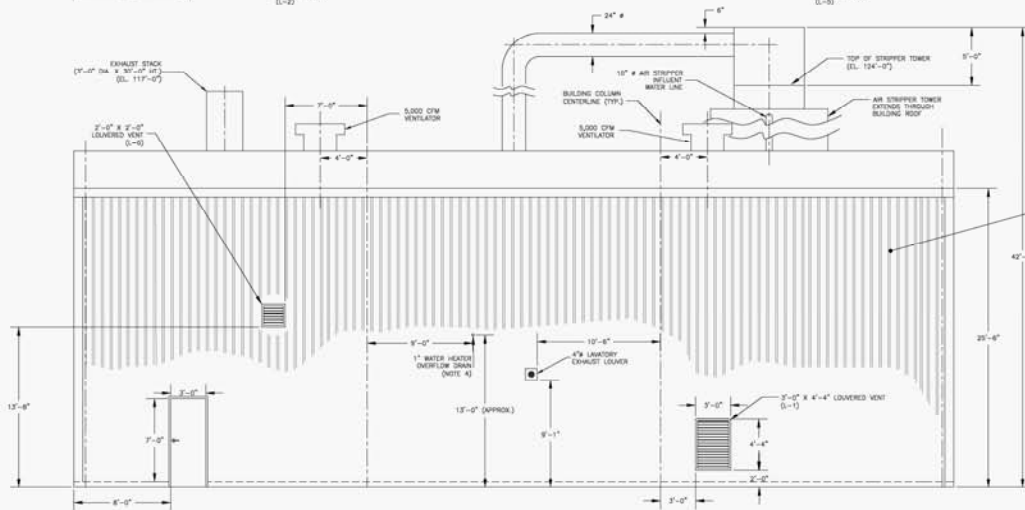
TETRA TECH, INC.

DATE: 08/24/2024	TIME: 10:58:24 AM	USER: [redacted]
<p style="text-align: center;">ENGINEERS FIELD ACTIVITY - NORTHEAST</p> <p style="text-align: center;">DU-36 AREA</p> <p style="text-align: center;">RECOVERY PITS</p> <p style="text-align: center;">PIPING AND UTILITY ROUTE DETAIL (SHEET 2 OF 3)</p>		
SCALE: 1" = 50'	SHEET: C-4	TOTAL SHEETS: 3





SECTION A NORTH ELEVATION
1/4" = 1'-0" (A-1)
TREATMENT PLANT BUILDING



SECTION B WEST ELEVATION
1/4" = 1'-0" (A-1)
TREATMENT PLANT BUILDING

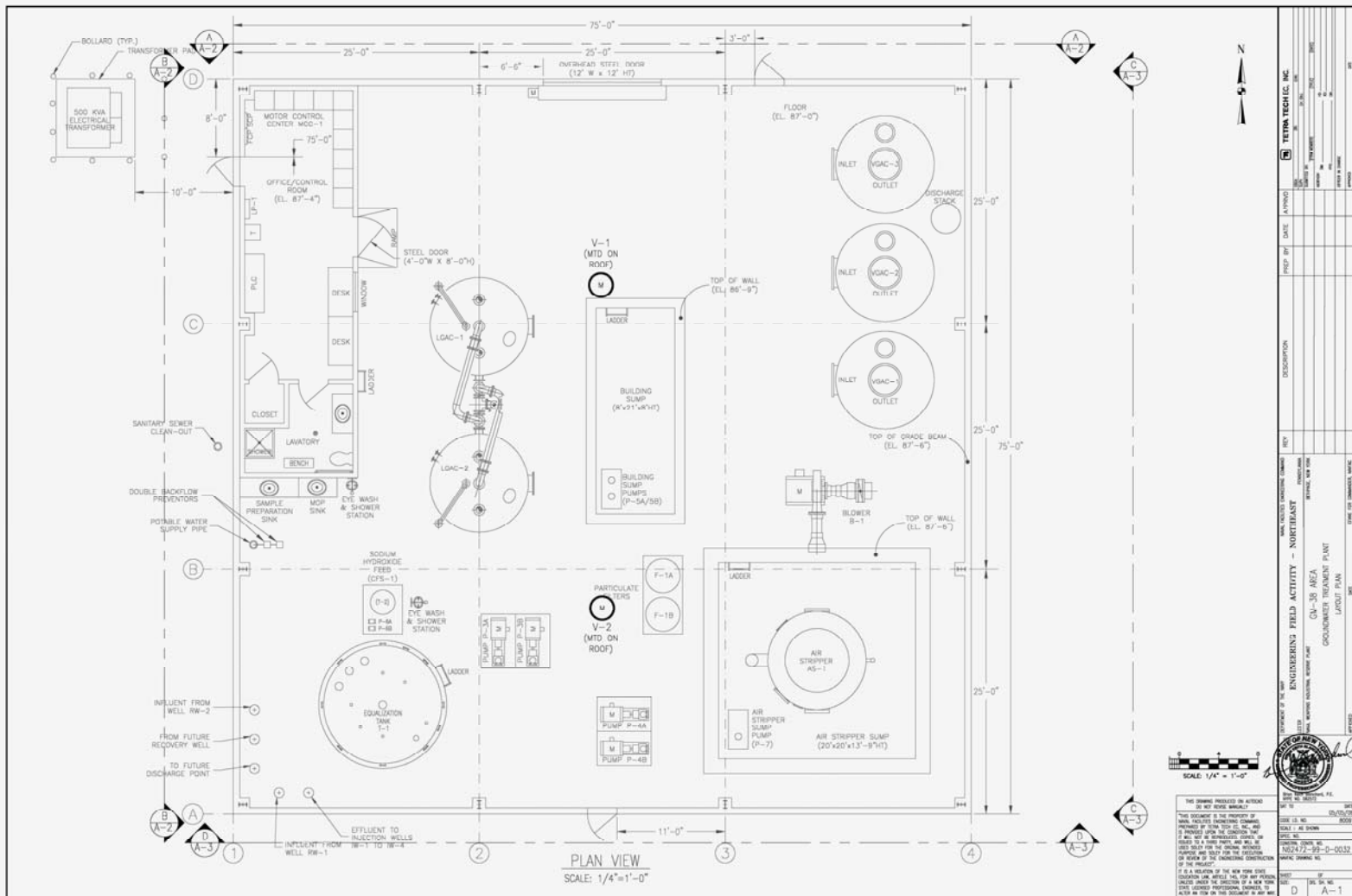
NOTES:

1. THE ROOF AND EXHAUST (DISCHARGE) STACKS SHALL BE FITTED WITH STAINLESS STEEL WEDGE AND WOOD SHIMMING. THE ROOFING SHALL BE EQUIPPED WITH A FLASH BAND WITH WATER FLOOD.
2. ALL LOWEST VENTS SHALL BE FITTED WITH STAINLESS STEEL WEDGES AND WOOD SHIMMING.
3. GUTTERS AND DOWNSPOUTS SHALL BE INSTALLED ALONG THE EAST AND WEST SIDES OF THE TREATMENT PLANT BUILDING. VENTILATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES. DOWN-SPOUT DISCHARGES SHALL BE EXTENDED APPROXIMATELY 2.5 FEET FROM THE BUILDING WALL.
4. WATER HEATER UNIT (SH-1) SHALL HAVE A DRAIN PAN WHICH DISCHARGES TO SEWER THROUGH A 1" BRASS PIPE DRAIN PIPE SHALL EXTEND THROUGH BUILDING WEF WALL AND BE IMMEDIATELY SPECIFIED DOWNWARD ON A 90° ELBOW.



TETRA TECH, INC.		DATE: 12/15/2010
PROJECT: 09-038 AREA	DESIGNER: J. W. WOOD	SCALE: AS SHOWN
DRAWN BY: J. W. WOOD	CHECKED BY: J. W. WOOD	DATE OF COMMENTS: N/A
APPROVED BY: J. W. WOOD	DATE: 12/15/2010	PROJECT NO. 09-038 AREA
DESCRIPTION: ENGINEERING FIELD ACTIVITY - NORTH EAST	REV: 01	SHEET NO. 2
REVISION: NORTH EAST	REV: 02	TOTAL SHEETS: 2
REVISION: NORTH EAST	REV: 03	
REVISION: NORTH EAST	REV: 04	
REVISION: NORTH EAST	REV: 05	
REVISION: NORTH EAST	REV: 06	
REVISION: NORTH EAST	REV: 07	
REVISION: NORTH EAST	REV: 08	
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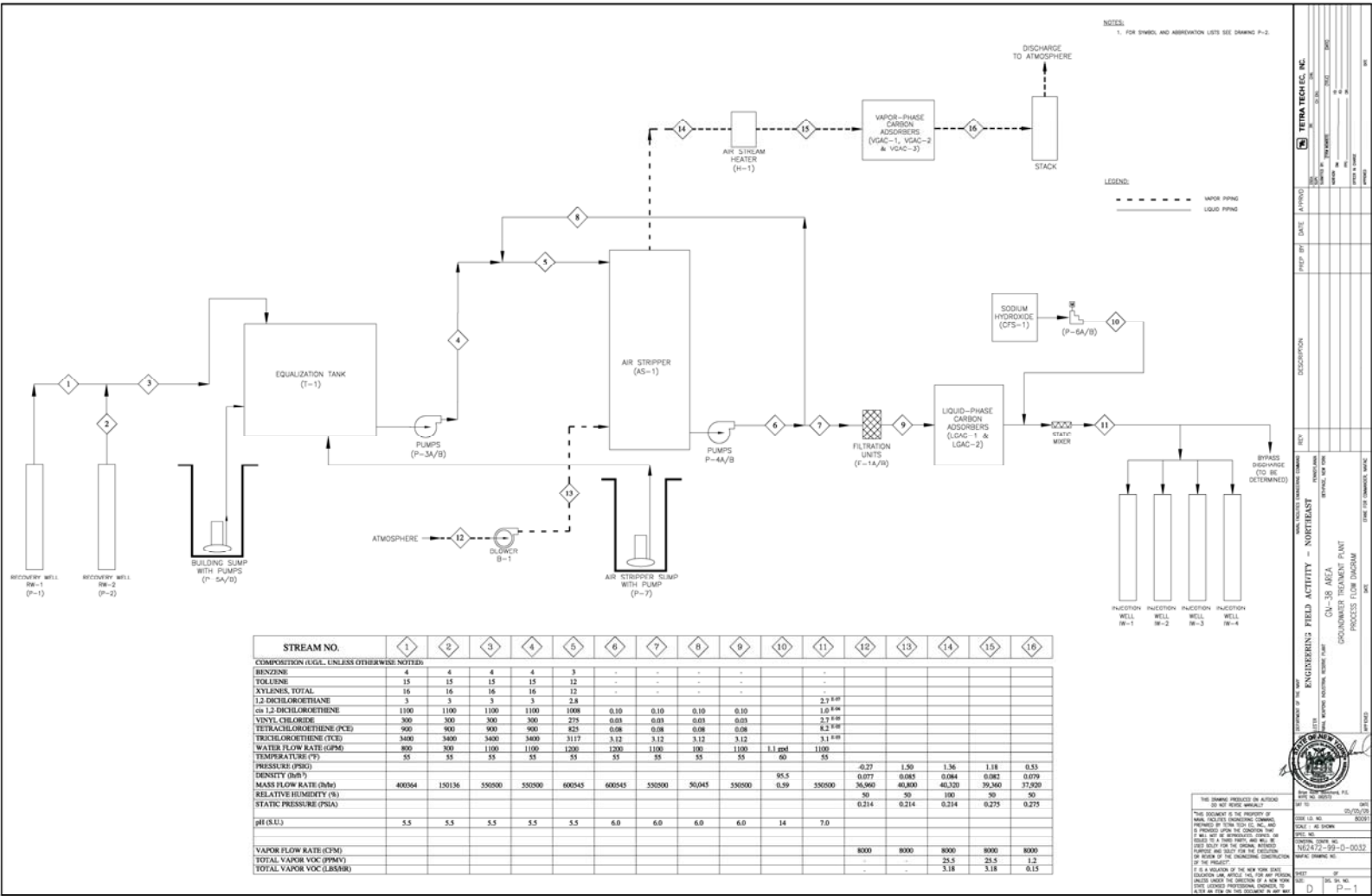


DATE	BY	APP'D	DESCRIPTION
10/10/10	J. J. J.		ENGINEERING FIELD ACTIVITY - NORTHBAY
10/10/10	J. J. J.		CU-35 AREA
10/10/10	J. J. J.		GROUNDWATER TREATMENT PLANT
10/10/10	J. J. J.		LAYOUT PLAN

NO. REV.	DATE	BY	APP'D	DESCRIPTION
1	10/10/10	J. J. J.		ISSUE FOR CONSTRUCTION

DATE	BY	APP'D	DESCRIPTION
10/10/10	J. J. J.		ENGINEERING FIELD ACTIVITY - NORTHBAY
10/10/10	J. J. J.		CU-35 AREA
10/10/10	J. J. J.		GROUNDWATER TREATMENT PLANT
10/10/10	J. J. J.		LAYOUT PLAN

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NOTES:
 1. FOR SYMBOL AND ABBREVIATION LISTS SEE DRAWING P-2.
LEGEND:
 - - - - - VAPOR PUMP
 _____ LIQUID PUMP

STREAM NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COMPOSITION (UG/L, UNLESS OTHERWISE NOTED)																
BENZENE	4	4	4	4	3	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	15	15	15	15	12	-	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL	16	16	16	16	12	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE	3	3	3	3	2.8	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-DICHLOROETHENE	1100	1100	1100	1100	1000	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
VINYL CHLORIDE	300	300	300	300	275	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
TETRACHLOROETHENE (PCE)	900	900	900	900	825	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
TRICHLOROETHENE (TCE)	3000	3000	3000	3000	2175	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12
WATER FLOW RATE (GPM)	800	300	1100	1100	1200	1200	100	100	100	1100	1100	1100	1100	1100	1100	1100
TEMPERATURE (°F)	55	55	55	55	55	55	55	55	55	55	60	55	55	55	55	55
PRESSURE (PSIG)												0.27	1.50	1.36	1.18	0.53
DENSITY (lb/ft ³)												0.077	0.083	0.084	0.082	0.079
MASS FLOW RATE (lbm)	400064	150136	550000	550000	600545	600545	550000	50045	550000	95.5	350000	36,560	40,300	40,320	39,360	37,920
RELATIVE HUMIDITY (%)												90	90	100	90	90
STATIC PRESSURE (PSIA)												0.214	0.214	0.214	0.275	0.275
pH (SLU)		5.5	5.5	5.5	5.5	6.0	6.0	6.0	6.0	14	7.0					
VAPOR FLOW RATE (CGM)												8000	8000	8000	8000	8000
TOTAL VAPOR VOC (PPMV)												25.3	25.5	25.5	1.2	
TOTAL VAPOR VOC (LB/HR)														3.18	3.18	0.15

ENGINEERING FIELD ACTIVITY - NORTHEAST
 CIVIL ENGINEER
 PROCESS FLOW DIAGRAM

DATE: 11/27/08
 DRAWN BY: [Redacted]
 CHECKED BY: [Redacted]
 APPR'D BY: [Redacted]

PROJECT NO.: [Redacted]
 SHEET NO.: [Redacted] OF [Redacted]

TETA TECH, INC.
 1000 ROUTE 100, SUITE 100
 GAITHERSBURG, MD 20878
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 WWW.TETA-TECH.COM

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 OUT THE WRITTEN PERMISSION OF TETA
 TECH, INC.

DATE: 11/27/08
 SCALE: AS SHOWN
 SHEET NO.: [Redacted]
 PROJECT NO.: [Redacted]
 SHEET NO.: [Redacted] OF [Redacted]

TETA TECH, INC.
 1000 ROUTE 100, SUITE 100
 GAITHERSBURG, MD 20878
 TEL: 410-278-2700
 FAX: 410-278-2701
 WWW.TETA-TECH.COM

DATE: 11/27/08
 SCALE: AS SHOWN
 SHEET NO.: [Redacted] OF [Redacted]



Esthetic Considerations

- Excavated soil used to construct berm
- Maintain as many existing trees as possible
- 100 new trees to be planted
- Building exterior to be a natural color
- Exterior building lights are motion activated
- No audible exterior alarms
- Chain link fence with privacy screening

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Well Installations

- Currently installed (Nov 2004 - May 2005)
 - 2 Recovery Wells
 - 1 Injection Well
 - 6 Monitoring Wells
- To be installed during construction
 - 3 Injection Wells
 - 4 Monitoring Wells

Groundwater Remediation Project

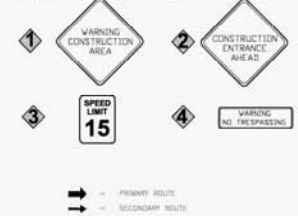
- Site History
- Treatment System Design
- Well Installations
- **Construction**
- Operation & Maintenance

Construction

- Project Signage and Traffic Controls
- Erosion and Sediment Controls
- Access Roads (permanent and temporary)
- Install Building Footers and Foundation
- Trenching to Recovery and Injection Wells
- Utility Tie-in Connections (electric, phone, water, and sanitary sewer)
- Building Floor



- NOTES:**
1. SANITARY SEWER MAIN(S) LOCATIONS AND RIM ELEVATIONS ARE AS PER L.K. WALKER ASSOCIATES FIELD DATA EXCEPT WHERE OTHERWISE NOTED. ALL SEWER AND SANITARY SERVICE SHOWN ARE AS PER NASSAU COUNTY SANITARY SEWER REGIONS PLANS.
 2. THE LOCATION OF OVERHEAD AND UNDERGROUND ELECTRIC LINES SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY LIPA UNLESS OTHERWISE NOTED.
 3. THE LOCATION OF GAS MAINS SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY NYCP&E.
 4. THE LOCATION OF WATER MAINS SHOWN ON THIS MAP ARE AS PER UTILITY MAPS PROVIDED BY THE RECHARGE WATER DISTRICT.
 5. SEWER SEWER DRAINAGE MAIN(S) LOCATIONS, EXCEPT MAIN LOCATIONS AND RIM ELEVATIONS ARE AS PER L.K. WALKER ASSOCIATES FIELD DATA EXCEPT WHERE OTHERWISE NOTED.
 6. THE LOCATION OF THE DRAINAGE STORM SEWER PIPES ON SOPHA STREET HAVE NOT BEEN EXAMINED. THESE ARE SHOWN ON RECORDS AT THE TURN OF SYSTEM BY DEPARTMENT OF PUBLIC WORKS.
 7. MEASUREMENTS ARE IN ACCORDANCE WITH U.S. STANDARDS.
 8. COORDINATES AND BOUNDARIES SHOWN ARE IN LEGAL BOUNDARIES OF THE NEW YORK STATE PLANE COORDINATE SYSTEM NAD 83. ELEVATIONS REFER TO NAVD 83.
 9. UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 2204, SUBDIVISION 2, OF NEW YORK STATE EDUCATION LAW.
 10. CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, ENGINEERING, ARCHITECT AND LENDING INSTITUTION LISTED HEREON, AND TO THE AGENTS OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
 11. RIGHTS-OF-WAY NOT SHOWN ARE NOT CERTIFIED.
 12. LIMITS IDENTIFIED ON THIS DRAWING AS PART OF THIS PROJECT ILLUSTRATE APPROXIMATE AND DO NOT REPRESENT ACTUAL PROPERTY LINES OR TRENCH WIDTHS.
 13. TEMPORARY ACCESS ROAD ENTRANCES FROM BRADWAY AVE. SHALL INCLUDE 30 FT. CURB CUT FOR INSTALLATION OF CONCRETE DRIVEWAY APPROVAL.



- LEGEND:**
- — — — — EXISTING GRADE-MAJOR CONTOUR
 - — — — — EXISTING GRADE-MAJOR CONTOUR
 - — — — — PROPOSED GRADE
 - — — — — TAX LOT LINE
 - — — — — OVERHEAD ELECTRIC WIRES
 - — — — — UNDERGROUND ELECTRIC WIRES
 - — — — — WATER MAIN
 - — — — — GAS MAIN
 - — — — — DRAINAGE LINES (STORM SEWER)
 - — — — — SANITARY SEWER MAIN
 - — — — — WOODED AREA
 - — — — — CHAIN-LINK OR BOARD FENCE
 - — — — — SILT FENCE
 - — — — — LIMITS OF CLEARING
 - — — — — NEW UNDERGROUND ELECTRIC WIRES
 - — — — — NEW WATER LINE
 - — — — — NEW SANITARY SEWER MAIN
 - — — — — HOPE PIPE AND ELECTRICAL CONDUIT
 - — — — — TAX LOT NUMBER
 - — — — — WATER VALVE
 - — — — — GAS VALVE
 - — — — — MONITORING WELL
 - — — — — RECOVERY WELL
 - — — — — INJECTION WELL
 - — — — — PULL BOX
 - — — — — LEAK DETECTION ACCESS POINT
 - — — — — EXISTING DECIDUOUS TREE
 - — — — — EXISTING CONIFEROUS TREE
 - — — — — MULTI-RING TREE LOCATION
 - — — — — SIGN
 - ★ 6916 - PUBLIC WATER SUPPLY WELL
 - — — — — MANHOLE
 - — — — — CHIMNEY
 - — — — — TEMPORARY ACCESS ROAD



DATE: 8/1/2004		DRAWN BY: J. WALKER		CHECKED BY: J. WALKER		APPROVED BY: J. WALKER	
PROJECT: ENGINEERING FIELD ACTIVITY - NORTH/EAST		SHEET: 04-18 AREA		SCALE: AS SHOWN		DATE: 8/1/2004	
DESCRIPTION: GROUNDWATER TREATMENT PLANT		PROJECT NO: 04-18-01-0012		SHEET NO: 11		TOTAL SHEETS: 11	
DRAWN BY: J. WALKER		CHECKED BY: J. WALKER		APPROVED BY: J. WALKER		DATE: 8/1/2004	
PROJECT NO: 04-18-01-0012		SHEET NO: 11		TOTAL SHEETS: 11		DATE: 8/1/2004	

THIS DRAWING PREPARED OR ADDED TO IS NOT BEING REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145 OF THE PROVISIONS, SECTION 2204 OF THE EDUCATION LAW, TO ALTER OR ADD TO THIS DOCUMENT IN ANY MANNER.

Construction (cont'd)

- Set Large Equipment with Crane
- Erect Building Building
- Interior Piping and Electric
- Install Fire Alarm and Security Systems
- Install and Test Instrumentation
- Test and Balance All Systems
- Site Restoration

Groundwater Remediation Project

- Site History
- Treatment System Design
- Well Installations
- Construction
- Operation & Maintenance

Operation & Maintenance

- Operate 24 hours per day
- Trained personnel visits
 - 3 days per week during initial 6 months
 - Additional visits as needed

Safety Considerations

- Double-walled extraction piping and access ports
- GWTP sloped floor to sump – contain spills
- Liquid-phase carbon units – Total VOC polish
- Backflow preventor on influent potable water line
- Instrumentation
 - Monitor key operating parameters
 - Redundant controls to ensure safe operation
 - Automatic system shut-down signals
 - Requires manual restart
 - Telemonitoring system

Telemonitoring

- Remote system monitoring via PC
- Alarm conditions communicated to designated personnel via autodialer
- Troubleshooting operational issues before arriving at the site

Future Operating Considerations

- Piping to termination vaults
 - One vault for additional recovery well
 - One vault for future discharge location
- Current GWTP flow will be 1100 gpm
 - Maximum capacity = 1375 gpm (+25%)
- GWTP can treat future development water
 - Water piped/transported to GWTP sump

Operation, Maintenance and Monitoring Plan

- Establishes method of operating & tracking progress of GWTP
- Sampling frequency (system & wells)
- Modify GW model with analytical results
 - Decrease in Total VOC over time
- Emergency response and troubleshooting

Operation, Maintenance and Monitoring Plan (cont'd)

- Components:
 - Regulatory requirements
 - Plant Safety
 - GWTP control and monitoring system
 - GW collection and treatment systems
 - Vapor and ancillary treatment systems
 - Preventative maintenance
 - Exit strategy based on GW modeling

Operation, Maintenance and Monitoring Plan (cont'd)

- Appendices:
 - Final list of equip., instrumentation & valves
 - Recommended spare parts list
 - Maintenance schedule
 - GWTP start-up procedure
 - Record drawings (surveys, process, PLC, etc.)

Project Status

- Obtain real estate access agreements from three property owners – TOB, NYS DOT, and Long Island Railroad
- Obtain all necessary permits
- Competitive bidding for all subcontracted work and equipment
- Notice to Proceed from NYS DEC
- Mobilize and start construction

Anticipated Schedule

Milestones	Date
Project Planning	On-going
Mobilization & Start of Construction	Summer 2006
End of Construction	Summer 2007
Plant Start-Up and Shakedown	Summer - Fall 2007
Start of Operation & Maintenance	Fall 2007

Wrap-up

Questions?