

**Quarterly Operations Report  
Second Quarter 2019**

**Groundwater Treatment Plant  
GM-38 Area Groundwater Remediation  
Naval Weapons Industrial Reserve Plant  
Bethpage, New York**

**Contract No. N40085-16-D-2288  
Contract Task Order No. 0005**

October 2019

Prepared for:



Naval Facilities Engineering Command Mid-Atlantic  
9324 Virginia Avenue  
Norfolk, VA 23511

Prepared by:



**KOMAN Government Solutions, LLC  
180 Gordon Drive, Suite 110  
Exton, Pennsylvania 19341  
(610) 363-3000**

**Quarterly Operations Report  
Second Quarter 2019**

**Groundwater Treatment Plant  
GM-38 Area Groundwater Remediation  
Naval Weapons Industrial Reserve Plant  
Bethpage, New York**

**Contract No. N40085-16-D-2288  
Contract Task Order No. 0005**

**October 2019**

Prepared for:

Naval Facilities Engineering Command Mid-Atlantic  
9324 Virginia Avenue  
Norfolk, VA 23511



Patrick Schauble  
Program Manager

10/17/2019

Date

Robert G. Gregory  
Project Manager

10/17/2019

Date

## TABLE OF CONTENTS

|            |   |            |
|------------|---|------------|
| <b>1.0</b> | <b>INTRODUCTION.....</b>                        | <b>1-1</b> |
| 1.1        | Background.....                                 | 1-1        |
| 1.2        | GWTP Overview .....                             | 1-2        |
| <b>2.0</b> | <b>GWTP OPERATIONS AND MAINTENANCE.....</b>     | <b>2-1</b> |
| 2.1        | Routine Maintenance Activities .....            | 2-1        |
| 2.2        | Non-routine Maintenance / Site Activities ..... | 2-1        |
| <b>3.0</b> | <b>GWTP MONITORING.....</b>                     | <b>3-1</b> |
| 3.1        | Process Water Quality Monitoring .....          | 3-1        |
| 3.2        | Air Quality Monitoring.....                     | 3-1        |
| 3.3        | Groundwater Quality Monitoring.....             | 3-2        |
| 3.3.1      | Groundwater Quality Results .....               | 3-3        |
| 3.3.2      | Groundwater Concentration Trends .....          | 3-3        |
| <b>4.0</b> | <b>CONCLUSIONS AND RECOMMENDATIONS.....</b>     | <b>4-1</b> |
| <b>5.0</b> | <b>REFERENCES.....</b>                          | <b>5-1</b> |

### TABLES

|         |  |
|---------|--|
| TABLE 1 | Discharge Monitoring Results – Second Quarter 2019   |
| TABLE 2 | Air Sampling Results – Second Quarter 2019           |
| TABLE 3 | Stack Emissions – Second Quarter 2019                |
| TABLE 4 | Groundwater Level Measurements – Second Quarter 2019 |

### FIGURES

|           |  |
|-----------|--|
| FIGURE 1  | Site Map   |
| FIGURE 2  | Process Flow Diagram   |
| FIGURE 3  | GM-38 Area Site Map  |
| FIGURE 4  | Second Quarter 2019 Groundwater Analytical Map – Select VOC Concentrations |
| FIGURE 5  | Groundwater Concentrations Trends of Select VOCs – RW-1                    |
| FIGURE 6a | Groundwater Concentrations Trends of Select VOCs – RW-3                    |
| FIGURE 6b | Groundwater Concentrations Trends of PCE and cis-1,2-DCE – RW-3            |

## **APPENDICES**

APPENDIX A NYSDEC Effluent Limitations and Monitoring Requirements and April 2019 –  
June 2019 DMRs

APPENDIX B NYSDEC Air Discharge Limit Documentation

APPENDIX C Field Logs – Second Quarter 2019

## Acronyms and Abbreviations

|        |   |
|--------|---|
| AOP    | Advanced Oxidation Process  |
| ARAR   | Applicable or Relevant and Appropriate Requirement                  |
| AS     | air stripper  |
| ASE    | air stripper effluent   |
| BFE    | bag filter effluent   |
| bgs    | below ground surface  |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| DAR    | Division of Air Resources   |
| DCA    | dichloroethane  |
| DCE    | dichloroethene  |
| DMR    | Discharge Monitoring Report   |
| DO     | dissolved oxygen  |
| DoD    | Department of Defense   |
| DTW    | depth to water  |
| EB     | equipment rinsate blank   |
| ECL    | Environmental Conservation Law                                      |
| ELAP   | Environmental Laboratory Accreditation Program                      |
| GOCO   | Government Owned Contractor Operated                                |
| gpm    | gallon per minute   |
| GWTP   | groundwater treatment plant   |
| HMI    | human-machine interface   |
| IRP    | Installation Restoration Program                                    |
| KGS    | KOMAN Government Solutions, LLC                                     |
| lb     | pound   |
| LGAC   | liquid-phase granular activated carbon                              |
| MS/MSD | matrix spike/matrix spike duplicate                                 |
| NAVFAC | Naval Facilities Engineering Command Mid-Atlantic                   |
| Navy   | U.S. Department of the Navy   |
| NELAC  | National Environmental Accreditation Conference                     |
| NG     | Northrop Grumman  |
| NWIRP  | Naval Weapons Industrial Reserve Plant                              |
| NYSDEC | New York State Department of Environmental Conservation             |
| NYSDOH | New York State Department of Health                                 |

---

|       |  |
|-------|--|
| O&M   | Operation and Maintenance                    |
| ORP   | oxidation reduction potential                |
| OU    | operable unit                                |
| PCE   | tetrachloroethene                            |
| PLC   | programmable logic controller                |
| QA/QC | quality assurance / quality control          |
| ROD   | Record of Decision                           |
| RPD   | relative percent difference                  |
| SC    | standard conductivity                        |
| SCADA | Supervisory Control and Data Acquisition     |
| scfm  | standard cubic feet per minute               |
| SPDES | Storm Pollution Discharge Elimination System |
| TB    | trip blank                                   |
| TCE   | trichloroethene                              |
| TE    | treated effluent                             |
| TIC   | tentatively identified compound              |
| TSS   | total suspended solids                       |
| TtEC  | Tetra Tech EC, Inc.                          |
| USEPA | U.S. Environmental Protection Agency         |
| VC    | vinyl chloride                               |
| VGAC  | vapor-phase granular activated carbon        |
| VOC   | volatile organic compound                    |

## 1.0 INTRODUCTION

KOMAN Government Solutions, LLC (KGS) has prepared this Quarterly Operations Report for the GM-38 Area Groundwater Treatment Plant (GWTP) at the Naval Weapons Industrial Reserve Plant (NWIRP) in Bethpage, New York. This report has been prepared for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic, under Contract No. N40085-16-D-2288, Contract Task Order No. 0005. This Second Quarter 2019 Operations Report details activities that occurred from April to June 2019. Data was collected and operational activities were performed by KGS in accordance with the following documents:

- *Final Operation, Maintenance & Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation, Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by Tetra Tech EC, Inc. (TtEC) in 2010, hereafter referred to as the “O&M Manual.”
- *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant, GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by TtEC in 2010.

### 1.1 Background

NWIRP Bethpage is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City (**Figure 1**) and is currently listed by New York State Department of Environmental Conservation (NYSDEC) as an “inactive hazardous waste site” (#1-30-003B). In the late 1990s, the Navy's property totaled approximately 109.5 acres and was a Government Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. NWIRP Bethpage was bordered on the north, west, and south by property owned, or formerly owned, by NG that covered approximately 550 acres, and on the east by a residential neighborhood.

The GM-38 Area refers to a cluster of monitoring wells installed in the 1990s by NG. The GM-38 Area is approximately 8,500 feet south, southeast and hydraulically downgradient of NWIRP Bethpage. The GWTP is located within a utility easement with a street address of 100 Broadway, Bethpage, NY.

The “hot spot” cleanup remedy for the GM-38 Area groundwater was originally set forth in Record of Decision (ROD) documents for Operable Unit 2 (OU 2) Groundwater for the NG and NWIRP Sites (New York State Registry Site Numbers 1-30-003A & 1-30-003B, respectively) issued by NYSDEC Division of Environmental Remediation in March 2001 and for the NWIRP Bethpage Site by NAVFAC in April 2003 (Revision 1). The selected remedy was chosen in accordance with the New York State Environmental Conservation Law (ECL) and the Navy's Installation Restoration Program (IRP). It is also consistent with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601-9675.

## 1.2 GWTP Overview

Currently, groundwater is extracted from recovery wells RW-1 and RW-3 (pumping at RW-3 was suspended from July 2015 to June 2018 as described below) and treated in the GWTP. The treatment process consists of flow equalization, air stripping and vapor-phase carbon treatment, bag filtration, and liquid-phase carbon treatment. Though the GWTP was originally equipped with a pH adjustment system utilizing sodium hydroxide, it has since been determined that pH adjustment is not necessary, and the equipment has been taken off-line and sodium hydroxide sent off site for beneficial reuse. A process flow diagram is presented as **Figure 2**. The treated water is either re-injected into injection well IW-1 or discharged into the Nassau County Recharge Basin #495. Under CERCLA, the Navy is required to meet the effluent requirement in the NYSDEC's Storm Pollution Discharge Elimination System (SPDES) Equivalent Application as an Applicable or Relevant and Appropriate Requirement (ARAR).

The GWTP was designed to operate at an average flow rate of 1,100 gallons per minute (gpm) (800 gpm from RW-1 and 300 gpm from RW-3), as measured by the average discharge flow rate. It was determined that this flow rate would be necessary to effectively contain the higher concentration of contamination in the GM-38 Area groundwater. Volatile Organic Compounds (VOCs) in the influent groundwater consist of trichloroethene (TCE), tetrachloroethene (PCE), vinyl chloride (VC), cis-1,2-dichloroethene (cis-1,2-DCE), 1,2-dichloroethane (1,2-DCA), benzene, toluene, and total xylenes.

The air stripper (AS) is a structural aluminum tower that is packed with 3.5-inch diameter polypropylene Jaeger Tripack. Groundwater is pumped to the air stripper distribution port and sprayed over the column of Jaeger Tripack at a flow rate of approximately 1,100 gpm. Previously, 100 gpm of recirculated water was also rerouted through the AS, but as of October 2010, recirculation was no longer deemed necessary to the operation of the system. An induced draft countercurrent flow of air enters the air stripper below the base of the packing material at a rate of 8,000 standard cubic feet per minute (scfm). The large surface area of the packing material allows for a mass transfer of the VOCs from the groundwater into the air stream. The VOCs in the off-gas, except for VC, are removed via two 20,000-pound (lb) vapor phase granular activated carbon (VGAC) units (VGAC-1 and VGAC-2). VC is oxidized by a 20,000-lb vessel containing zeolite impregnated with potassium permanganate (VGAC-3) into potassium chloride and carbon dioxide. The potassium chloride remains in the pore structure of the zeolite substrate. The treated off-gas is discharged from the stack.

Water treated by the air stripper is subsequently processed through three 8,000-lb liquid phase granular activated carbon (LGAC) units in parallel prior to discharge in the recovery basin (or injection well, if necessary).

The GWTP is controlled by a programmable logic controller (PLC)-based digital and analog control system, with instrumentation that monitors pH, pressure, tank level, flow and differential pressure transmitters, water level in recovery wells, and motor operational status. The information in the PLC is made available to an operator via a human-machine interface (HMI) program. By using this program, the status of the GWTP can be displayed in real time and adjusted, if necessary, by the operator.



A 2014 evaluation of the GM-38 Area, conducted in order to better determine the capture zone of the recovery wells, recommended that use of recovery well RW-3 be discontinued (*Capture Zone Evaluation and Path Forward, GM-38 Area Groundwater Treatment Plant* [Tetra Tech 2014]). The report was sent to NYSDEC in March 2014 and recommended ceasing operation of recovery well RW-3 and increasing the pumping rate of recovery well RW-1. These system modifications would maintain the existing GWTP pumping rate of 1,000 to 1,100 gpm while maintaining the desired capture zone of the GWTP (Tetra Tech 2014). NYSDEC concurred with the implementation of this path forward and associated system modifications on 20 April 2015. On 1 July 2015, in accordance with the approved path forward, recovery well RW-3 was taken off-line. The flowrate of recovery well RW-1 was increased from approximately 800 gpm to approximately 1,000 gpm. Pumping at RW-3 was once again resumed in June 2018 to address persisting VOC concentrations at this well. Pumping rates were adjusted so that approximately 80% of the total groundwater extracted is from RW-1 with the remaining 20% extracted from RW-3.

## **2.0 GWTP OPERATIONS AND MAINTENANCE**

While designed to run completely automated, the GWTP requires regular visits by an operator to record and adjust operational parameters and to perform scheduled maintenance. The GWTP is equipped with telemetry that will alert an on-call operator in the event of a plant shutdown.

### **2.1 Routine Maintenance Activities**

Routine maintenance activities at the GWTP were performed during the operator's visits. These activities include general site inspections, collection of operational data (water and vapor flowrates, differential pressures across the AS, carbon units, bag filter units and blower discharge pressures, tank levels and totalizer readings), measurement of water levels in the recovery wells, adjustment of pump signal settings, collection of vapor and process water samples, changing out of bag filters, switching of lead/lag pump assignments, and preventive maintenance of system equipment.

In addition, the following maintenance tasks were also performed during the Second Quarter:

- On 8 May, the Operator backwashed LGAC #2, the plant was down for 1.2 hours.
- On 19 June, the Operator rotated and greased the pumps and motors.

### **2.2 Non-routine Maintenance / Site Activities**

The following non-routine activities occurred during the Second Quarter:

- On 31 March, the GWTP was down for 8.5 hours from a high sump alarm caused by a leaking pressure gauge inside the plant on influent pump 3A. The pressure gauge was replaced and the plant placed back on line on 1 April.
- On 12 April, Eagle Control was onsite to assess the plant sump level probe and provide an estimate for programming a new level probe into the Supervisory Control and Data Acquisition (SCADA) system.
- On 17 April, the system was down for approximately 6 hours due to a power outage.
- On 21 May, F&M was on site to troubleshoot the inoperative plant sump pump. The check valve was disassembled and the impeller was cleared of debris. The pump was operating properly after cleaning.

### 3.0 GWTP MONITORING

The intent of the GWTP is to remove contaminant mass and reduce elevated VOC levels to levels similar to those in the surrounding aquifer. It is anticipated that GWTP operation will minimize contaminant impacts on water supply wells and currently unaffected portions of the groundwater aquifer. The GWTP is not intended to remediate groundwater contamination in the local aquifer to non-detectable levels (TtEC 2010). Various process samples (water and vapor) are collected on a monthly basis to monitor GWTP efficiency and to ensure compliance with Federal and State effluent discharge and air emission requirements. In addition, groundwater samples are collected semi-annually to monitor water quality and determine the effectiveness of the remediation activities and monitor the hydraulic containment and capture of impacted groundwater by the recovery wells.

#### 3.1 Process Water Quality Monitoring

Processed groundwater is analyzed to comply with calculations submitted by the Navy and documented in the NYSDEC Water Division SPDES Equivalent Application for the effluent limitations and monitoring requirements. These results are also submitted to NYSDEC on a monthly basis in the form of a Discharge Monitoring Report (DMR). A copy of the current NYSDEC effluent limitations, monitoring constituents, and the reporting forms are included in **Appendix A**.

Monthly aqueous samples are collected from the active recovery well, RW-1, RW-3, and the treated effluent (TE) discharge line. In addition, various intermediary process system samples are collected monthly, consisting of air stripper effluent (ASE), bag filter effluent (BFE), and effluent of each of the three LGAC units (LC1, LC2, and LC3).

The analytical results of monthly process water samples collected during the Second Quarter are presented in **Table 1**. The data demonstrate that all permitted constituents were in compliance with regulatory requirements during the Second Quarter. **Table 1** also summarizes the average monthly flowrates in gallons per minute along with the total volume of water processed during each month of the Second Quarter. Monthly DMRs for the Second Quarter (April – June 2019) are included in **Appendix A**.

#### 3.2 Air Quality Monitoring

Treated off-gas discharged at the stack of the GWTP is subject to emissions limitations. Original discharge goals were derived from calculations submitted by the Navy and approved by the NYSDEC Division of Air Resources (DAR) in July 2009. In November 2011, the Navy submitted an evaluation proposing revised discharge goals, which NYSDEC approved in October 2013. A copy of this documentation is included as **Appendix B**.

While only sampling of the stack emissions is required for NYSDEC compliance, process vapor samples are also collected using 6-L summa canisters at various locations to monitor for breakthrough of the VGAC units. The analytical results of monthly influent and effluent vapor samples as well as midfluent samples (VC12 and VC13) collected during the Second Quarter are presented in **Table 2**. Air emissions calculations using the stack vapor concentrations along with discharge flowrates are presented in **Table 3**.

The calculations demonstrate that all constituents were within the regulatory requirements during the Second Quarter based on the calculated emission rates.

### 3.3 Groundwater Quality Monitoring

The groundwater monitoring well system at the GM-38 Groundwater Remediation Area consists of fourteen monitoring wells, three recovery wells (RW-1, RW-2, RW-3) and one injection well (IW-1). Groundwater level measurements were collected and are summarized in **Table 4**. Though RW-2 was installed in 2005, a pump was never installed in this well and the well is not operated as a recovery well due to concerns expressed by the Bethpage Water District. As mentioned above, pumping at RW-3 was suspended between July 2015 and June 2018. RW-3 was reactivated on 1 June 2018 to address persistent VOC concentrations at this location. Well locations are depicted on **Figure 3**.

Depth to water (DTW) measurements are collected from twelve of the monitoring wells on a quarterly basis. Prior to 2014, water quality samples were collected from eight of the monitoring wells on a quarterly basis; beginning in 2014, the sample collection frequency was reduced to semi-annually, with sample collection generally in the March and September time-frame. The monitoring network includes well clusters located near the recovery and injection wells as described below and as shown on **Figure 3**. In addition, two wells, GM-38D and GM-38D2, located at the corner of Arthur Avenue and Broadway, are monitored by others.

Descriptions of monitoring well locations are as follows:

#### Recovery Well 1 (RW-1) Monitoring Wells

The RW-1 cluster consists of three monitoring wells screened between 395 and 435 feet below ground surface (bgs). RW1-MW1 is located approximately 140 feet northwest of RW-1 and RW1-MW2 is located approximately 50 feet north of RW-1. RW1-MW3 is located approximately 400 feet northeast of RW-1, on the eastern side of Seaford Oyster Bay Expressway. All three wells are hydraulically monitored while only RW1-MW1 and RW1-MW3 are also monitored for water quality.

#### Recovery Well 2 (RW-2) Monitoring Wells

The RW-2 cluster consists of three monitoring wells screened between 470 and 510 feet bgs. RW2-MW1 is located approximately 60 feet northwest of RW-2, RW2-MW2 is located approximately 20 feet west of RW-2, and RW2-MW3 is located approximately 100 feet west of RW-2. All three wells are hydraulically monitored while only RW2-MW1 is monitored for water quality.

#### Recovery Well 3 (RW-3) Monitoring Wells

The RW-3 cluster consists of four monitoring wells. RW3-MW2 and RW3-MW4 are screened between 475 and 495 feet bgs. RW3-MW1 and RW3-MW3 are screened between 330 and 350 feet bgs and 320 and 340 feet bgs, respectively. RW3-MW1 and RW3-MW2 are located approximately 500 feet west of the GM-38 cluster, at the intersection of Arthur Avenue and Leroy Avenue. RW3-MW3 and RW3-MW4 are located approximately 400 feet north of the intersection of Arthur Avenue and Broadway. All four wells are both hydraulically monitored and monitored for water quality.

### TP-01

TP-01 is screened between 450 and 470 feet bgs and is located approximately 25 feet north of the GWTP building, inside the fenced area. It is hydraulically monitored to observe the change in water levels due to the influence from the pumping rates at the neighboring public water supply well field near the hot spot area and is also monitored for water quality.

### Injection Well 1 (IW-1) Monitoring Well

There is one monitoring well associated with injection well IW-1. IW1-MW1 is screened between 20 and 150 feet bgs, is located approximately 20 feet south of IW-1 and is only hydraulically monitored on a quarterly basis.

## **3.3.1 Groundwater Quality Results**

Quarterly groundwater level measurements of the twelve monitoring wells were collected on 30 May 2019. Results are summarized in **Table 4**. A copy of the field log is included in **Appendix C**.

As mentioned above, groundwater samples are only collected semi-annually in the First and Third Quarters; no groundwater samples were collected from the monitoring wells during the Second Quarter 2019. Samples are collected monthly from recovery well RW-1 and RW-3, results of which are summarized in **Table 1**.

## **3.3.2 Groundwater Concentration Trends**

Groundwater analytical results of select VOCs (cis-1,2-DCE, PCE, TCE, and VC) for the recovery wells during the Second Quarter Monitoring Event are presented graphically as **Figure 4**. Additionally, concentration trends of select VOCs (cis-1,2-DCE, TCE, and PCE, as well as VC) for RW-1 and RW-3 are presented in **Figures 5** and **Figure 6a and 6b**, respectively and discussed below.

**Figure 5** presents concentrations measured at recovery well RW-1. Concentrations of TCE have decreased from initial concentrations in early 2010 (747 µg/L detected in April 2010), remaining below 300 µg/L since the latter half of 2012 and decreasing to a low of 63.1 µg/L in May 2019. Concentrations of cis-1,2-DCE have followed a similar trend, decreasing from a high of 160 µg/L in February 2010 to a low of 4.36 µg/L in March 2019, and remaining below 5.0 µg/ during the Second Quarter 2019. PCE concentrations have also exhibited decreasing trends over time, with concentrations decreasing from 180 µg/L in February 2010 to a low of 16.0 µg/L in May 2019. Concentrations of VC have decreased below initial concentrations in 2010. After reaching a maximum concentration of 61 µg/L in February 2010, VC concentrations have remained below 1.0 µg/L since June 2013. Vinyl chloride was not detected during the Second Quarter 2019.

**Figure 6a-6b** presents concentrations measured at recovery well RW-3. Concentrations of TCE have decreased from initial concentrations in February 2010 (660 µg/L), remaining below 300 µg/L from the latter half of 2012 through the Third Quarter 2015. RW-3 was taken off-line from 1 July 2015 until 1 June 2018, which may have contributed to the increased concentrations in 2016. However, since March 2016, TCE concentrations have decreased from 371 µg/L down to a low of 120 µg/L detected in March 2018 but have increased slightly to an average concentration of 151 µg/L during the Second Quarter 2019.

Concentrations of cis-1,2-DCE have consistently remained below 4.0 µg/L, and below 2.0 µg/L since September 2013, though the concentration increased slightly to 2.4 µg/L in March 2016, then decreased again below 2.0 µg/L since June 2018. PCE has only been detected infrequently at this location, with the most recent detection of 0.25 µg/L in June 2019. Vinyl chloride has not been detected during any monitoring event.

#### **4.0 CONCLUSIONS AND RECOMMENDATIONS**

The intent of the groundwater treatment system at GM-38 is to remove mass and reduce elevated VOC concentrations to levels similar to those in the surrounding aquifer, and in doing so minimize the impacts on downgradient water supply wells and currently unaffected portions of the aquifer. Based on the removal of VOCs by the GWTP and decreasing contaminant concentration trends observed in the recovery wells and several of the monitoring wells, progress toward these goals is apparent. Based on the concentrations in the groundwater wells, the GWTP should continue to be operated. The groundwater sampling frequency for the eight monitoring wells has been reduced to semi-annually in accordance with the O&M Manual. Water levels for the 12 monitoring wells will continue to be monitored on a quarterly basis.

## 5.0 REFERENCES

Tetra Tech, Inc. (Tetra Tech). 2014. *Capture Zone Evaluation and Path Forward, GM-38 Area Groundwater Treatment Plant, Naval Weapons Industrial Reserve Plant, Bethpage, New York*. March.

Tetra Tech EC, Inc. (TtEC). 2010. *Final Operation, Maintenance & Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation, Naval Weapons Industrial Reserve Plant, Bethpage, New York*. April.

Tetra Tech EC, Inc. (TtEC). 2010a. *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant, GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York*. September.



## **TABLES**

Table 1  
 GM-38 Area Groundwater Remediation  
 Groundwater Treatment Plant  
 Naval Weapons Industrial Reserve Plant - Bethpage, NY  
 Discharge Monitoring Results  
 Second Quarter 2019

| SPDES Parameters               | Daily Maximum Goal | Units   | April 2019         |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
|--------------------------------|--------------------|---------|--------------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------|---------------------------------|
|                                |                    |         | RW-1               | RW-3               | Combined Influent | Air Stripper Effluent (ASE) | Bag Filter Effluent (BFE) | Liquid Carbon 1 Effluent (LC1) | Liquid Carbon 2 Effluent (LC2) | Liquid Carbon 3 Effluent (LC3) | Treated Effluent (TE) | Treated Effluent (TE) Duplicate |
| Process Stream                 |                    |         |                    |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Well Depth                     |                    | ft      | 445                | 530                | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Screened Interval              |                    | ft      | 335-395<br>410-430 | 392-412<br>442-504 | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Sampling Date                  |                    |         | 4/3/19             |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Average Flowrate               | 1100               | GPM     | 637                | 169                | 806               | NR                          | 826                       | NR                             | NR                             | NR                             | 855                   | NR                              |
| Total Flow                     |                    | gallons | 28,015,378         | 7,432,355          | 35,447,734        | NR                          | 36,345,616                | NR                             | NR                             | NR                             | 37,628,461            | NR                              |
| pH                             | 5.5 - 8.5          | SU      | 5.14               | 5.32               | 5.18              | 6.26                        | 6.29                      | 6.33                           | 6.33                           | 6.34                           | 6.33                  | 6.34                            |
| Chloroform                     | 5                  | µg/L    | 0.335 J            | 0.289 J            | 0.33 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethane             | 5                  | µg/L    | 1.14 J             | 1.68 J             | 1.25 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,2-Dichloroethane             | 0.6                | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethene             | 5                  | µg/L    | 0.876 J            | 0.987 J            | 0.899 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| cis 1,2-Dichloroethene         | 5                  | µg/L    | 4.49 J             | 1.22 J             | 3.80 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| trans 1,2-Dichloroethene       | 5                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Tetrachloroethene              | 5                  | µg/L    | 20.8               | 0.229 J            | 16.49             | 0.232 J                     | 0.230 J                   | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,1-Trichloroethene          | 5                  | µg/L    | 0.576 J            | 0.547 J            | 0.570 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Trichloroethene                | 5                  | µg/L    | 77.3               | 168                | 96.3              | 1.63 J                      | 1.19 J                    | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,2-Trichlorotrifluoroethane | 5                  | µg/L    | ND (1.0)           | 0.718 J            | 0.15 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Vinyl Chloride                 | 2                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,4-Dioxane                    | --                 | µg/L    | 2.1                | 4.8                | 2.67              | NS                          | NS                        | NS                             | NS                             | NS                             | NS                    | NS                              |
| Mercury                        | 0.00025            | mg/L    | ND (0.00010)       | ND (0.00010)       | ND (0.00010)      | ND (0.00010)                | 0.0001 J                  | 0.0001 J                       | 0.00008 J                      | ND (0.00010)                   | ND (0.00010)          | ND (0.00010)                    |
| Total Suspended Solids (TSS)   | NA                 | mg/L    | ND (1.0)           | 1.5                | 0.3               | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |

**Table 1**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Discharge Monitoring Results**  
**Second Quarter 2019**

| SPDES Parameters               | Daily Maximum Goal | Units   | May 2019           |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
|--------------------------------|--------------------|---------|--------------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------|---------------------------------|
|                                |                    |         | RW-1               | RW-3               | Combined Influent | Air Stripper Effluent (ASE) | Bag Filter Effluent (BFE) | Liquid Carbon 1 Effluent (LC1) | Liquid Carbon 2 Effluent (LC2) | Liquid Carbon 3 Effluent (LC3) | Treated Effluent (TE) | Treated Effluent (TE) Duplicate |
| Process Stream                 |                    |         |                    |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Well Depth                     |                    | ft      | 445                | 530                | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Screened Interval              |                    | ft      | 335-395<br>410-430 | 392-412<br>442-504 | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Sampling Date                  |                    |         | 5/1/19             |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Average Flowrate               | 1100               | GPM     | 659                | 168                | 827               | NR                          | 818                       | NR                             | NR                             | NR                             | 877                   | NR                              |
| Total Flow                     |                    | gallons | 29,369,700         | 7,475,300          | 36,845,000        | NR                          | 36,440,500                | NR                             | NR                             | NR                             | 39,069,200            | NR                              |
| pH                             | 5.5 - 8.5          | SU      | 5.34               | 5.07               | 5.29              | 6.37                        | 6.39                      | 6.39                           | 6.39                           | 6.40                           | 6.39                  | 6.40                            |
| Chloroform                     | 5                  | µg/L    | 0.310 J            | 0.300 J            | 0.31 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethane             | 5                  | µg/L    | 1.45 J             | 2.12 J             | 1.59 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,2-Dichloroethane             | 0.6                | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethene             | 5                  | µg/L    | 0.880 J            | 1.11 J             | 0.927 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| cis 1,2-Dichloroethene         | 5                  | µg/L    | 4.89 J             | 1.21 J             | 4.14 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| trans 1,2-Dichloroethene       | 5                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Tetrachloroethene              | 5                  | µg/L    | 16.0               | 0.250 J            | 12.80             | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,1-Trichloroethene          | 5                  | µg/L    | 0.610 J            | 0.550 J            | 0.598 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Trichloroethene                | 5                  | µg/L    | 63.1               | 143                | 79.3              | 1.26 J                      | 1.01 J                    | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,2-Trichlorotrifluoroethane | 5                  | µg/L    | ND (1.0)           | 0.800 J            | 0.16 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Vinyl Chloride                 | 2                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,4-Dioxane                    | --                 | µg/L    | 2.1                | 4.5                | 2.59              | NS                          | NS                        | NS                             | NS                             | NS                             | 2.6                   | NS                              |
| Mercury                        | 0.00025            | mg/L    | ND (0.00010)       | ND (0.00010)       | ND (0.00010)      | ND (0.00010)                | ND (0.00010)              | ND (0.00010)                   | ND (0.00010)                   | ND (0.00010)                   | ND (0.00010)          | ND (0.00010)                    |
| Total Suspended Solids (TSS)   | NA                 | mg/L    | ND (1.0)           | 5.8                | 1.2               | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |

**Table 1**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Discharge Monitoring Results**  
**Second Quarter 2019**

| SPDES Parameters               | Daily Maximum Goal | Units   | June 2019          |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
|--------------------------------|--------------------|---------|--------------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------|---------------------------------|
|                                |                    |         | RW-1               | RW-3               | Combined Influent | Air Stripper Effluent (ASE) | Bag Filter Effluent (BFE) | Liquid Carbon 1 Effluent (LC1) | Liquid Carbon 2 Effluent (LC2) | Liquid Carbon 3 Effluent (LC3) | Treated Effluent (TE) | Treated Effluent (TE) Duplicate |
| Process Stream                 |                    |         |                    |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Well Depth                     |                    | ft      | 445                | 530                | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Screened Interval              |                    | ft      | 335-395<br>410-430 | 392-412<br>442-504 | NA                | NA                          | NA                        | NA                             | NA                             | NA                             | NA                    | NA                              |
| Sampling Date                  |                    |         | 6/3/19             |                    |                   |                             |                           |                                |                                |                                |                       |                                 |
| Average Flowrate               | 1100               | GPM     | 658                | 190                | 849               | NR                          | 833                       | NR                             | NR                             | NR                             | 888                   | NR                              |
| Total Flow                     |                    | gallons | 28,440,905         | 8,229,550          | 36,670,454        | NR                          | 36,002,680                | NR                             | NR                             | NR                             | 38,359,733            | NR                              |
| pH                             | 5.5 - 8.5          | SU      | 5.23               | 4.99               | 5.18              | 5.88                        | 5.91                      | 5.89                           | 5.89                           | 5.90                           | 5.92                  | 5.92                            |
| Chloroform                     | 5                  | µg/L    | 0.290 J            | 0.310 J            | 0.29 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethane             | 5                  | µg/L    | 1.40 J             | 2.09 J             | 1.55 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,2-Dichloroethane             | 0.6                | µg/L    | 0.220 J            | ND (1.0)           | 0.17 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1-Dichloroethene             | 5                  | µg/L    | 0.830 J            | 0.980 J            | 0.864 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| cis 1,2-Dichloroethene         | 5                  | µg/L    | 4.41 J             | 1.15 J             | 3.68 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| trans 1,2-Dichloroethene       | 5                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Tetrachloroethene              | 5                  | µg/L    | 17.8               | 0.250 J            | 13.86             | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,1-Trichloroethene          | 5                  | µg/L    | 0.550 J            | 0.510 J            | 0.541 J           | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Trichloroethene                | 5                  | µg/L    | 65.6               | 142                | 82.7              | 0.940 J                     | 1.00 J                    | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,1,2-Trichlorotrifluoroethane | 5                  | µg/L    | ND (1.0)           | 0.650 J            | 0.15 J            | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| Vinyl Chloride                 | 2                  | µg/L    | ND (1.0)           | ND (1.0)           | ND (1.0)          | ND (1.0)                    | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |
| 1,4-Dioxane                    | --                 | µg/L    | 1.7                | 4.1                | 2.24              | NS                          | NS                        | NS                             | NS                             | NS                             | NS                    | NS                              |
| Mercury                        | 0.00025            | mg/L    | ND (0.00010)       | ND (0.00010)       | ND (0.00010)      | ND (0.00010)                | ND (0.00010)              | ND (0.00010)                   | ND (0.00010)                   | ND (0.00010)                   | ND (0.00010)          | ND (0.00010)                    |
| Total Suspended Solids (TSS)   | NA                 | mg/L    | ND (1.0)           | 6.2                | 1.4               | 8.8                         | ND (1.0)                  | ND (1.0)                       | ND (1.0)                       | ND (1.0)                       | ND (1.0)              | ND (1.0)                        |

**Notes:**

J - Estimated result between laboratory method detection limit and reporting limit

NA - Not Applicable

ND - Not detected above laboratory method detection limit. Limit of detection (LOD) given in parentheses.

NS - Not Sampled

gpm - gallons per minute

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

**Table 2**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Air Sampling Results**  
**Second Quarter 2019**

| DAR Parameters             | Discharge Goal <sup>(3)</sup> | Units             | April 2019      |       |        |             |                    |
|----------------------------|-------------------------------|-------------------|-----------------|-------|--------|-------------|--------------------|
|                            |                               |                   | Influent (VCI1) | VC12  | VC23   | Effluent    | Effluent Duplicate |
| Process Stream             |                               |                   |                 |       |        |             |                    |
| Sampling Date              |                               |                   | 4/3/19          |       |        |             |                    |
| Average Flowrate           |                               | CFM               | NR              | NR    | NR     | 9,397       | NR                 |
| Total Flow <sup>(1)</sup>  |                               | ft <sup>3</sup>   | NR              | NR    | NR     | 395,981,738 | NR                 |
| Total Flow <sup>(2)</sup>  |                               | m <sup>3</sup>    | NR              | NR    | NR     | 11,212,954  | NR                 |
| 1,2-Dichloroethane         | NA                            | µg/m <sup>3</sup> | 2.2 J           | 2.7 J | ND     | ND          | ND                 |
| cis 1,2-Dichloroethene     | ≤ 100,000 <sup>(4)</sup>      | µg/m <sup>3</sup> | 54              | 54    | 88     | 72          | 69                 |
| trans 1,2-Dichloroethene   |                               | µg/m <sup>3</sup> | ND              | ND    | 1.5 J  | ND          | ND                 |
| 1,2-Dichloroethene (total) | ≤ 100,000                     | µg/m <sup>3</sup> | 56              | 56    | 90     | 71          | 67                 |
| Toluene                    | NA                            | µg/m <sup>3</sup> | 0.36 J          | ND    | ND     | ND          | ND                 |
| Xylene                     | NA                            | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |
| 1,1,2-Trichloroethane      | NA                            | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |
| Trichloroethene            | ≤ 2600                        | µg/m <sup>3</sup> | 1100            | 1100  | 0.86 J | 0.62 J      | ND                 |
| Vinyl Chloride             | ≤ 560                         | µg/m <sup>3</sup> | 1.3 J           | ND    | 0.87 J | ND          | 0.66 J             |
| Tetrachloroethene          | ≤ 5100                        | µg/m <sup>3</sup> | 180             | 11    | ND     | ND          | ND                 |

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m<sup>3</sup> - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft<sup>3</sup>) = avg flowrate (cfm) \* operational time (min)

(2) Total Flow (m<sup>3</sup>) = total flow (ft<sup>3</sup>) \* (0.3048<sup>3</sup>)m<sup>3</sup>/ft<sup>3</sup>

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

**Table 2**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Air Sampling Results**  
**Second Quarter 2019**

| DAR Parameters             | Discharge Goal <sup>(3)</sup> | Units             | May 2019        |       |        |             |                    |  |
|----------------------------|-------------------------------|-------------------|-----------------|-------|--------|-------------|--------------------|--|
|                            |                               |                   | Influent (VCI1) | VC12  | VC23   | Effluent    | Effluent Duplicate |  |
| Process Stream             |                               |                   |                 |       |        |             |                    |  |
| Sampling Date              |                               |                   | 5/1/19          |       |        |             |                    |  |
| Average Flowrate           |                               | CFM               | NR              | NR    | NR     | 8,972       | NR                 |  |
| Total Flow <sup>(1)</sup>  |                               | ft <sup>3</sup>   | NR              | NR    | NR     | 399,909,108 | NR                 |  |
| Total Flow <sup>(2)</sup>  |                               | m <sup>3</sup>    | NR              | NR    | NR     | 11,324,165  | NR                 |  |
| 1,2-Dichloroethane         | NA                            | µg/m <sup>3</sup> | 1.9 J           | 2.9 J | ND     | ND          | ND                 |  |
| cis 1,2-Dichloroethene     | ≤ 100,000 <sup>(4)</sup>      | µg/m <sup>3</sup> | 48              | 52    | 99     | 79          | 83                 |  |
| trans 1,2-Dichloroethene   |                               | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |  |
| 1,2-Dichloroethene (total) | ≤ 100,000                     | µg/m <sup>3</sup> | 48              | 52    | 99     | 79          | 83                 |  |
| Toluene                    | NA                            | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |  |
| Xylene                     | NA                            | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |  |
| 1,1,2-Trichloroethane      | NA                            | µg/m <sup>3</sup> | ND              | ND    | ND     | ND          | ND                 |  |
| Trichloroethene            | ≤ 2600                        | µg/m <sup>3</sup> | 1100            | 1500  | 2.5 J  | 1.3 J       | ND                 |  |
| Vinyl Chloride             | ≤ 560                         | µg/m <sup>3</sup> | 1.1 J           | 1.0 J | 0.98 J | 0.95 J      | 0.80 J             |  |
| Tetrachloroethene          | ≤ 5100                        | µg/m <sup>3</sup> | 170             | 11    | ND     | ND          | ND                 |  |

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m<sup>3</sup> - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft<sup>3</sup>) = avg flowrate (cfm) \* operational time (min)

(2) Total Flow (m<sup>3</sup>) = total flow (ft<sup>3</sup>) \* (0.3048<sup>3</sup>)m<sup>3</sup>/ft<sup>3</sup>

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

**Table 2**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Air Sampling Results**  
**Second Quarter 2019**

| DAR Parameters             | Discharge Goal <sup>(3)</sup> | Units             | June 2019       |      |        |             |                    |
|----------------------------|-------------------------------|-------------------|-----------------|------|--------|-------------|--------------------|
|                            |                               |                   | Influent (VCI1) | VC12 | VC23   | Effluent    | Effluent Duplicate |
| Process Stream             |                               |                   |                 |      |        |             |                    |
| Sampling Date              |                               |                   | 6/3/19          |      |        |             |                    |
| Average Flowrate           |                               | CFM               | NR              | NR   | NR     | 8,631       | NR                 |
| Total Flow <sup>(1)</sup>  |                               | ft <sup>3</sup>   | NR              | NR   | NR     | 372,863,970 | NR                 |
| Total Flow <sup>(2)</sup>  |                               | m <sup>3</sup>    | NR              | NR   | NR     | 10,558,332  | NR                 |
| 1,2-Dichloroethane         | NA                            | µg/m <sup>3</sup> | 2.5 J           | ND   | ND     | ND          | ND                 |
| cis 1,2-Dichloroethene     | ≤ 100,000 <sup>(4)</sup>      | µg/m <sup>3</sup> | 52              | 50   | 91     | 79          | 75                 |
| trans 1,2-Dichloroethene   |                               | µg/m <sup>3</sup> | ND              | ND   | 2.0 J  | 2.1 J       | ND                 |
| 1,2-Dichloroethene (total) | ≤ 100,000                     | µg/m <sup>3</sup> | 52              | 50   | 93     | 81          | 75                 |
| Toluene                    | NA                            | µg/m <sup>3</sup> | 1.1 J           | ND   | ND     | ND          | ND                 |
| Xylene                     | NA                            | µg/m <sup>3</sup> | ND              | ND   | ND     | ND          | ND                 |
| 1,1,2-Trichloroethane      | NA                            | µg/m <sup>3</sup> | 2.8 J           | ND   | ND     | ND          | ND                 |
| Trichloroethene            | ≤ 2600                        | µg/m <sup>3</sup> | 1100            | 2000 | 0.88 J | 8.3         | 0.78 J             |
| Vinyl Chloride             | ≤ 560                         | µg/m <sup>3</sup> | 1.1 J           | 1 J  | 1.1 J  | 0.89 J      | 0.65 J             |
| Tetrachloroethene          | ≤ 5100                        | µg/m <sup>3</sup> | 180             | 10   | ND     | ND          | ND                 |

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m<sup>3</sup> - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft<sup>3</sup>) = avg flowrate (cfm) \* operational time (min)

(2) Total Flow (m<sup>3</sup>) = total flow (ft<sup>3</sup>) \* (0.3048<sup>3</sup>)m<sup>3</sup>/ft<sup>3</sup>

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

**Table 3**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Stack Emissions**  
**Second Quarter 2019**

| DAR Parameters        | Discharge Goal <sup>(1)</sup> | Units           | April 2019  | May 2019    | June 2019   |
|-----------------------|-------------------------------|-----------------|-------------|-------------|-------------|
| Sampling Date         |                               |                 | 4/3/19      | 5/1/19      | 6/3/19      |
| Average Flowrate      |                               | CFM             | 9,397       | 8,972       | 8,631       |
| Total Flow            |                               | ft <sup>3</sup> | 395,981,738 | 399,909,108 | 372,863,970 |
| Total Flow            |                               | m <sup>3</sup>  | 11,212,954  | 11,324,165  | 10,558,332  |
| Trichloroethene       | 0.09                          | lb/hr           | 0.00002     | 0.00004     | 0.00027     |
| Vinyl Chloride        | 0.02                          | lb/hr           | 0.00000     | 0.00003     | 0.00003     |
| 1,2 Dichloroethene    | 11                            | lb/hr           | 0.00244     | 0.00265     | 0.00262     |
| 1,2-Dichloroethane    | NA                            | lb/hr           | 0.00000     | 0.00000     | 0.00000     |
| Toluene               | NA                            | lb/hr           | 0.00000     | 0.00000     | 0.00000     |
| Total Xylene          | NA                            | lb/hr           | 0.00000     | 0.00000     | 0.00000     |
| 1,1,2-Trichloroethane | NA                            | lb/hr           | 0.00000     | 0.00000     | 0.00000     |
| Tetrachloroethene     | 0.18                          | lb/hr           | 0.00000     | 0.00000     | 0.00000     |

Notes:

NA - Not applicable

lb/hr - pounds per hour

DAR - Division of Air Resources

CFM - Cubic feet per minute

Stack Emissions (lb/hr) = average flowrate (cfm) \* (0.3048<sup>^3</sup>)m<sup>3</sup>/ft<sup>3</sup> \* conc.(ug/m<sup>3</sup>) \* 1 lb/453592370 ug \* 60 min/hr

(1) Discharge goal as concurred by NYSDEC's letter dated 31 October 2013.



**Table 4**  
**GM-38 Area Groundwater Remediation**  
**Groundwater Treatment Plant**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Level Measurements**  
**Second Quarter 2019**

| Monitoring Well ID | Date     | Well Elevation (ft amsl) | Total Depth (ft) | Screen Interval (ft) | Depth to Water (ft) | Groundwater Elevation (ft amsl) |
|--------------------|----------|--------------------------|------------------|----------------------|---------------------|---------------------------------|
| RW1-MW1            | 05/30/19 | 85.86                    | 435              | 395-435              | 38.42               | 47.44                           |
| RW1-MW2            | 05/30/19 | 87.35                    | 435              | 395-435              | 41.71               | 45.64                           |
| RW1-MW3            | 05/30/19 | 80.34                    | 435              | 395-435              | 38.42               | 41.92                           |
| RW2-MW1            | 05/30/19 | 90.75                    | 510              | 470-510              | 44.04               | 46.71                           |
| RW2-MW2            | 05/30/19 | 90.15                    | 510              | 470-510              | 42.47               | 47.68                           |
| RW2-MW3            | 05/30/19 | 89.75                    | 510              | 470-510              | 42.55               | 47.20                           |
| RW3-MW1            | 05/30/19 | 92.22                    | 350              | 330-350              | 40.19               | 52.03                           |
| RW3-MW2            | 05/30/19 | 91.98                    | 495              | 475-495              | 43.11               | 48.87                           |
| RW3-MW3            | 05/30/19 | 92.98                    | 340              | 320-340              | 42.41               | 50.57                           |
| RW3-MW4            | 05/30/19 | 92.92                    | 495              | 475-495              | 44.17               | 48.75                           |
| TP-01              | 05/30/19 | 85.91                    | 470              | 450-470              | 40.13               | 45.78                           |
| IW1-MW1            | 05/30/19 | 89.41                    | 150              | 20-150               | 37.48               | 51.93                           |
| GM38D              | NA       | 91.37                    | 340              | 320-340              | NA                  | NA                              |
| GM382D             | NA       | 91.57                    | 495              | 475-495              | NA                  | NA                              |

**Notes:**

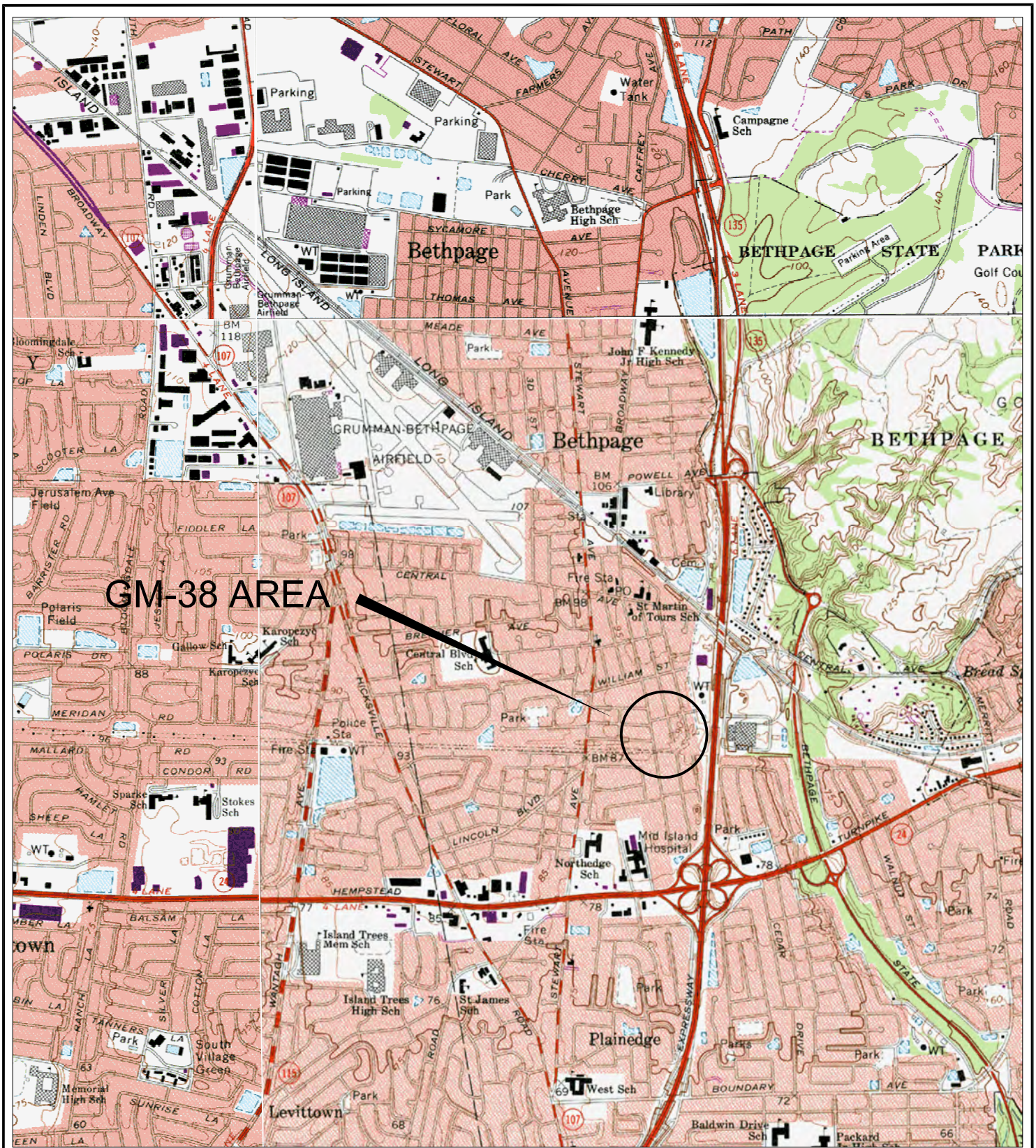
amsl - above mean sea level

ft - feet

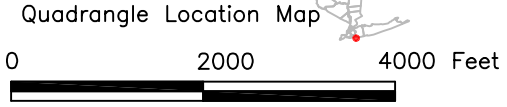
NA - Not Available

## **FIGURES**





**GM-38 AREA**



U.S. Navy RAC  
 Engineering Field Activity, Northeast  
 GM-38 Area (Offsite)  
 NWIRP Bethpage  
 Bethpage, NY

Figure 1  
 Site Location Map

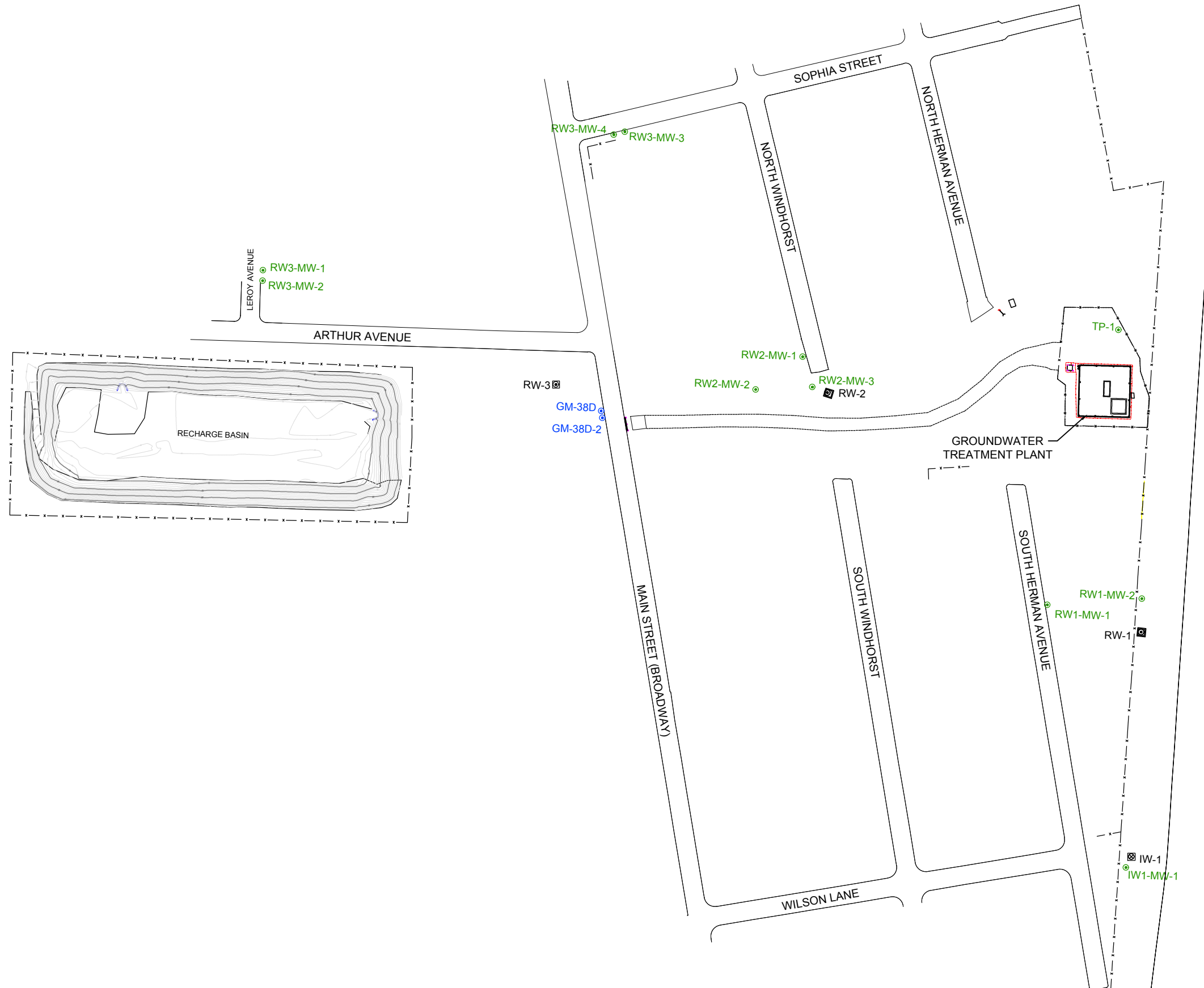
Source: U.S.G.S. Topographic Maps (7.5 Minute)  
 Amityville, Freeport, Hicksville, Huntington, NY Quadrangles



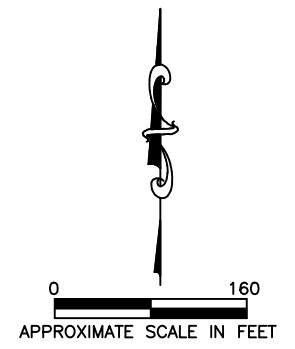


**Legend**

- Monitoring Well (Monitored by Navy)
- Monitoring Well (Monitored by Northrop Grumman)
- ⊠ Recovery Well
- ⊠ Injection Well



(SEAFORD-OYSTER BAY EXPRESSWAY - RTE 135)



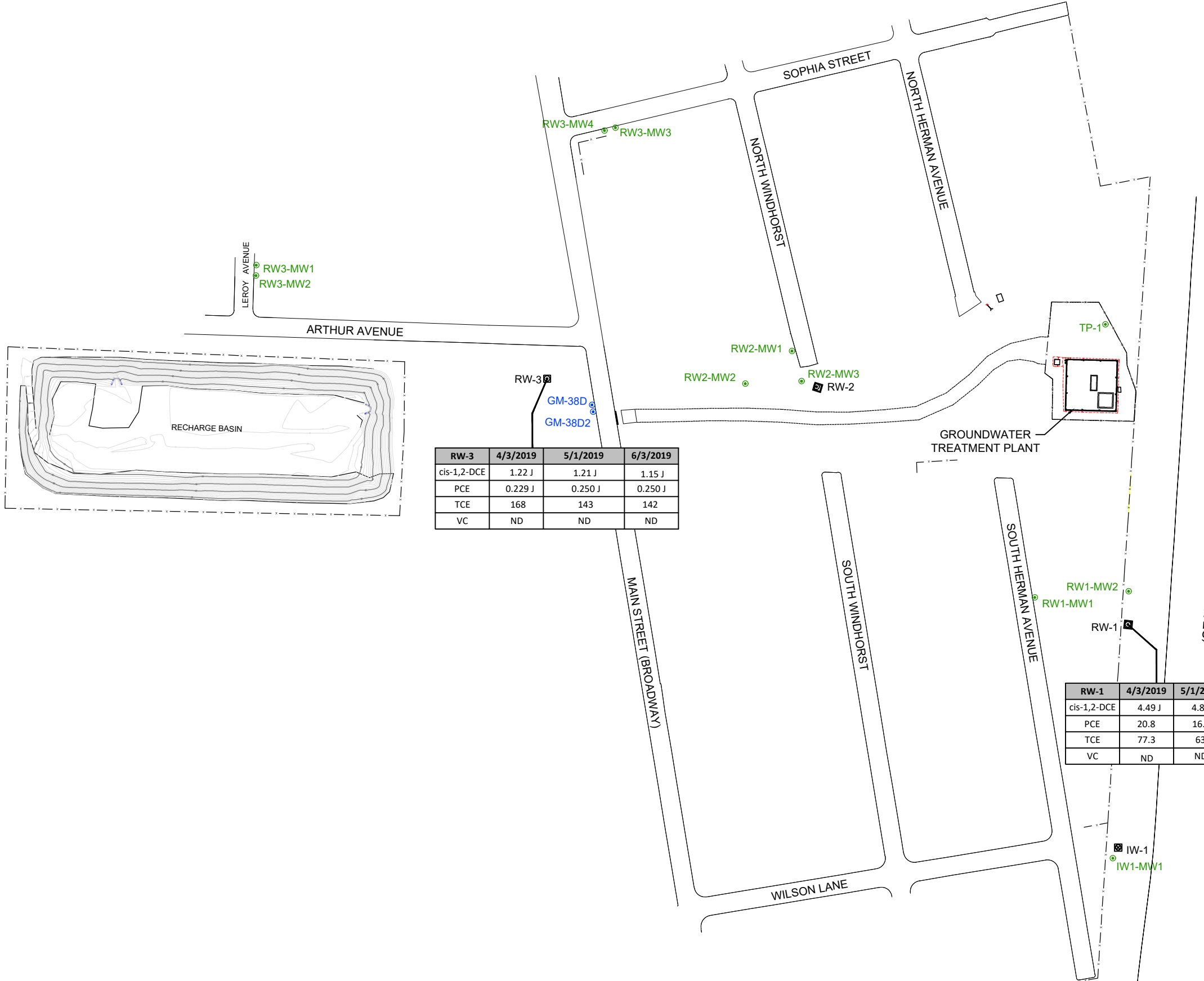
|   |            |        |  |
|---|------------|--------|--|
| <b>SITE MAP</b>   |            |        |  |
| <b>NWIRP BETHPAGE GM-38 AREA<br/>BETHPAGE, NEW YORK</b>                         |            |        |  |
| KOMAN Government Solutions, LLC<br>180 Gordon Drive, Suite 110, Exton, PA 19341 |            |        |  |
| SCALE   | DATE       | FIGURE |  |
| SEE BARSCALE  | 01/15/2018 | 3      |  |

**Legend**

- Monitoring Well (Monitored by Navy)
- Monitoring Well (Monitored by Northrop Grumman)
- ⊠ Recovery Well
- ⊞ Injection Well
- J Estimated value
- ND Not Detected above laboratory method detection limit
- NS Not Sampled
- DCE Dichloroethene
- PCE Tetrachloroethane
- TCE Trichloroethane
- VC Vinyl Chloride

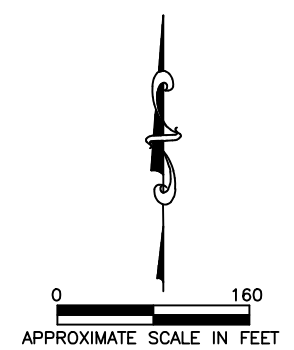
**Notes:**  
All concentrations reported in µg/L.

Monitoring wells are sampled on a semi-annual basis and were not sampled during the 2nd Quarter 2019. Recovery wells RW-1 and RW-3 are sampled on a monthly basis.



| RW-3        | 4/3/2019 | 5/1/2019 | 6/3/2019 |
|-------------|----------|----------|----------|
| cis-1,2-DCE | 1.22 J   | 1.21 J   | 1.15 J   |
| PCE         | 0.229 J  | 0.250 J  | 0.250 J  |
| TCE         | 168      | 143      | 142      |
| VC          | ND       | ND       | ND       |

| RW-1        | 4/3/2019 | 5/1/2019 | 6/3/2019 |
|-------------|----------|----------|----------|
| cis-1,2-DCE | 4.49 J   | 4.89 J   | 4.41 J   |
| PCE         | 20.8     | 16.0     | 17.8     |
| TCE         | 77.3     | 63.1     | 65.6     |
| VC          | ND       | ND       | ND       |



**2nd QUARTER 2019  
GROUNDWATER ANALYTICAL MAP  
SELECT VOC CONCENTRATIONS**

**NWIRP BETHPAGE GM-38 AREA  
BETHPAGE, NEW YORK**

KOMAN Government Solutions, LLC  
180 Gordon Dr., Suite 110, Exton, PA, 19341

|              |           |        |  |
|--------------|-----------|--------|--|
| SCALE        | DATE      | FIGURE |  |
| SEE BARSCALE | 6/20/2019 | 4      |  |

Figure 5  
GM-38 Area Groundwater Remediation  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Groundwater Concentration Trends of Select VOCs  
RW1

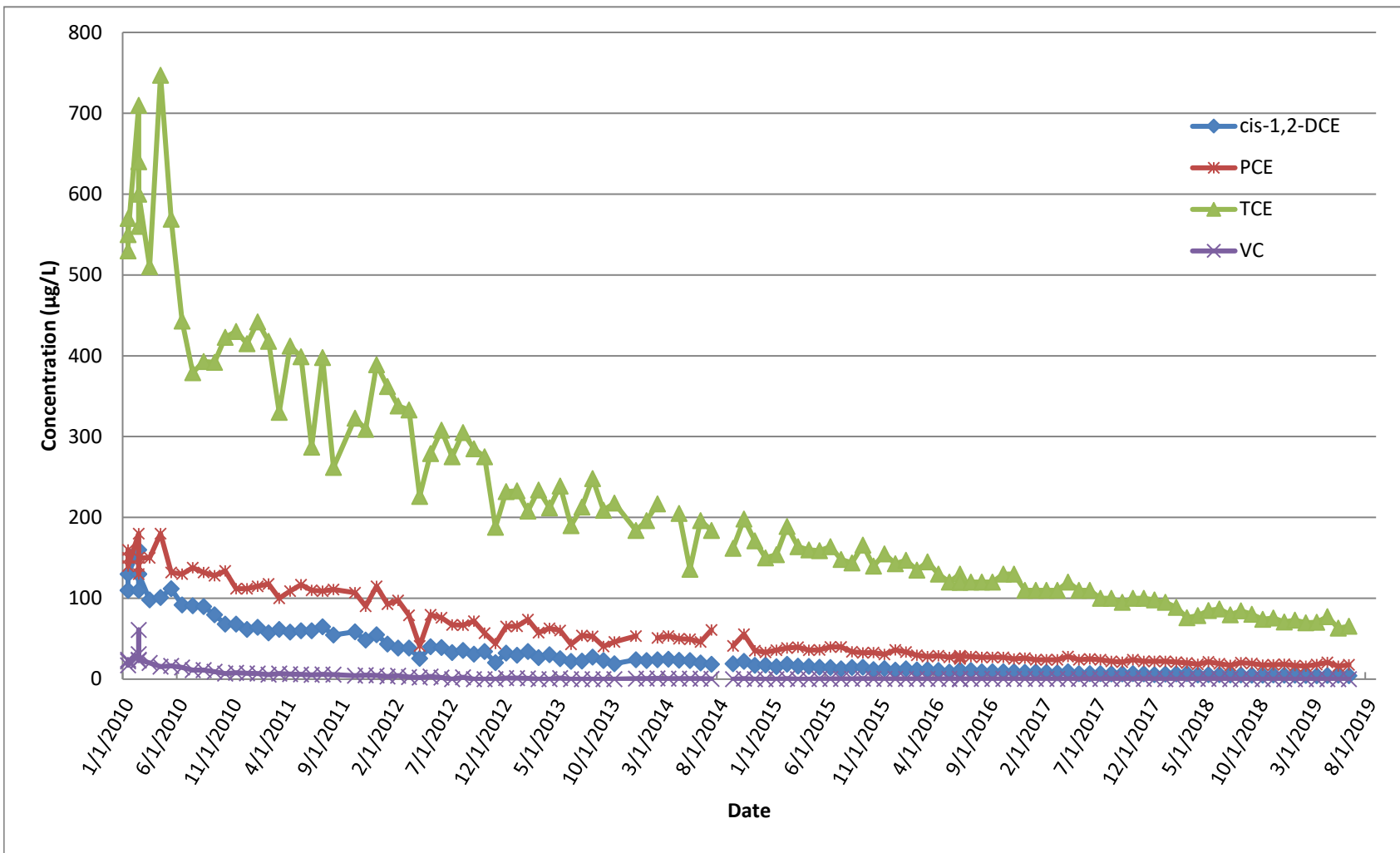
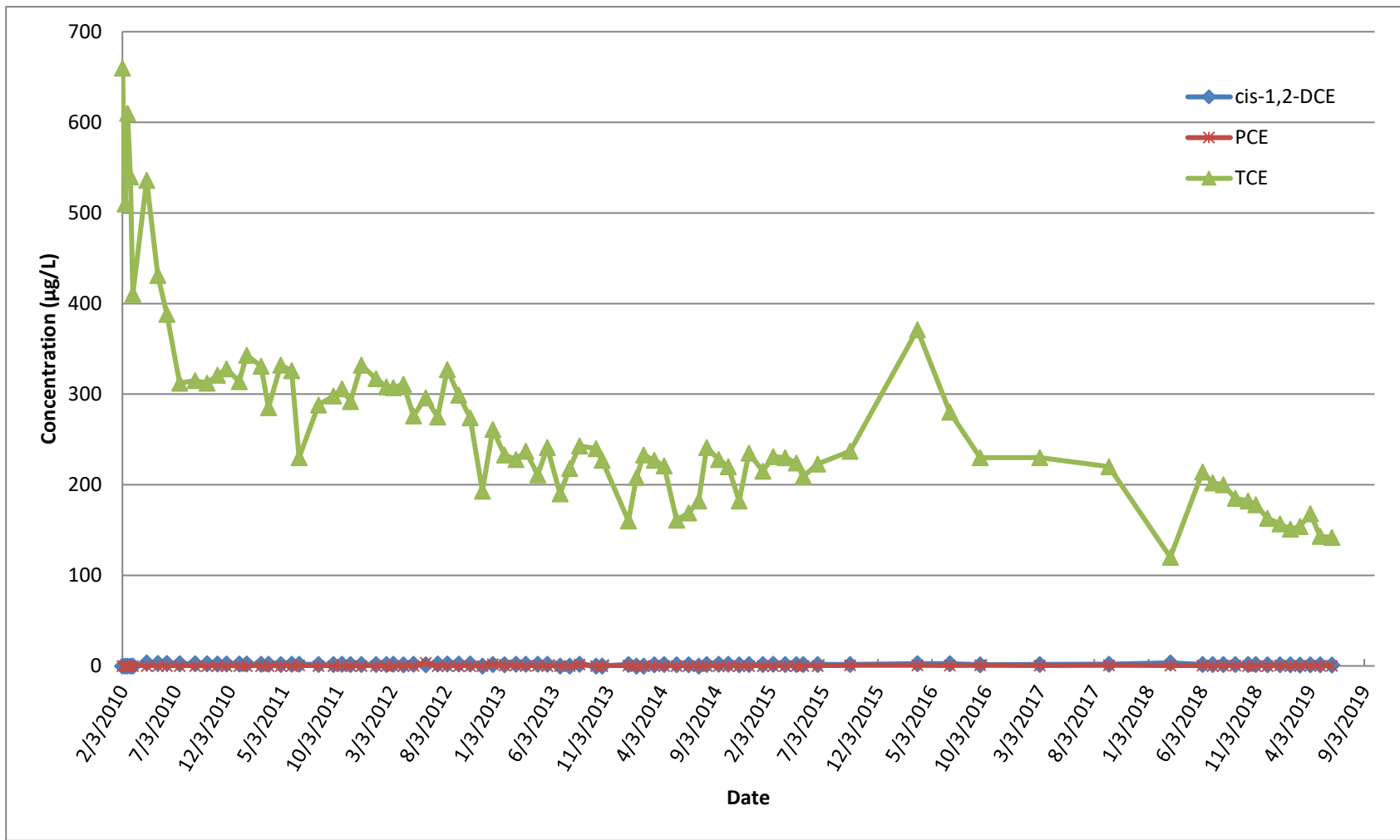
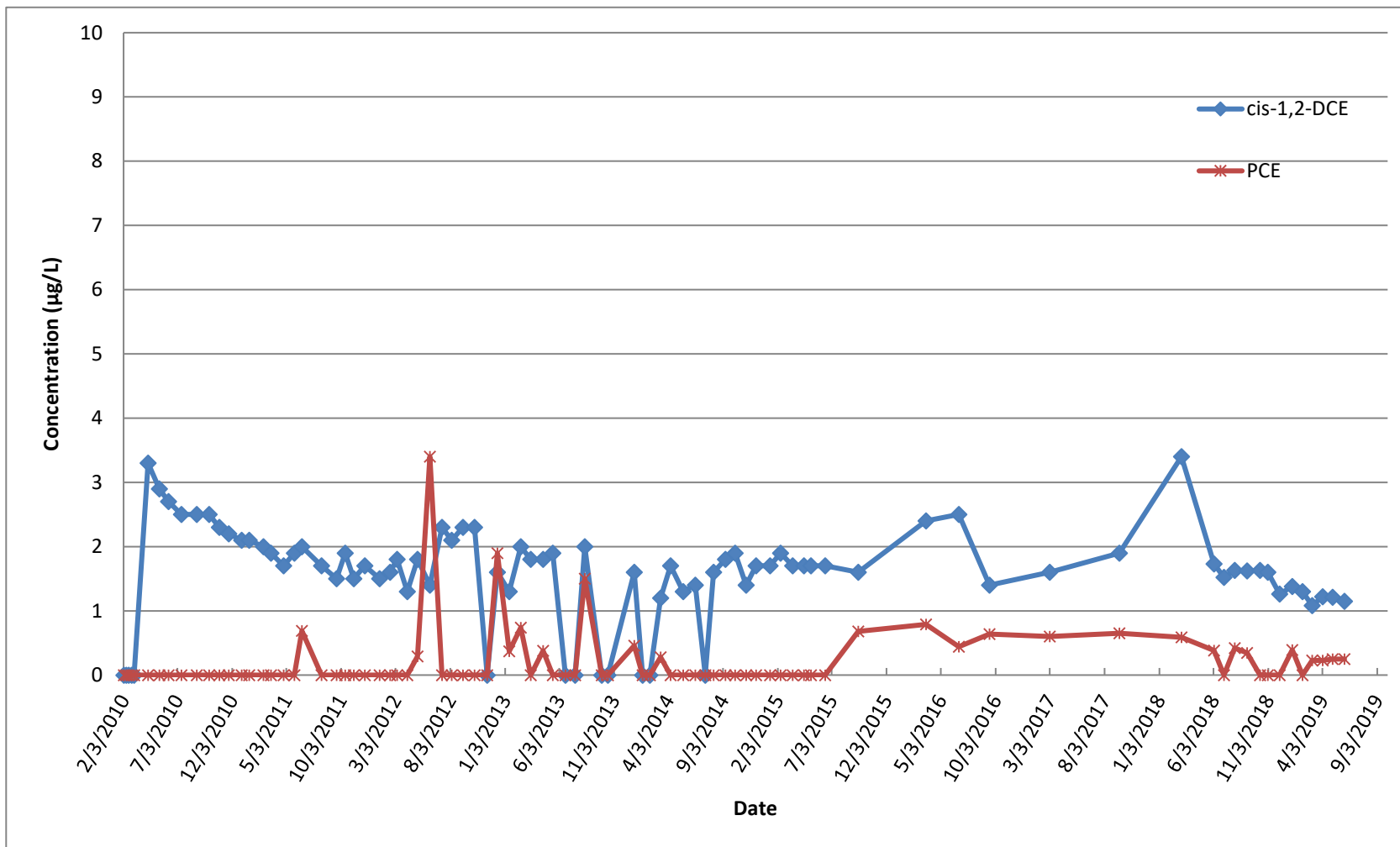


Figure 6a  
GM-38 Area Groundwater Remediation  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Groundwater Concentration Trends of Select VOCs  
RW3





**Figure 6b**  
**GM-38 Area Groundwater Remediation**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**RW3**



**APPENDIX A**

**NYSDEC EFFLUENT LIMITATIONS AND MONITORING  
REQUIREMENTS AND MONTHLY DMRS**

**APRIL 2019**



6 May 2019

Mr. Jason Pelton  
New York State Department of Environmental Conservation  
Division of Solid & Hazardous Materials  
625 Broadway  
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT  
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2  
APRIL 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 April to 30 April 2019 are presented in Attachment A. In the April reporting period, no significant downtime was recorded for the GM38.

As indicated in Attachment A, all SPDES permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

***KOMAN Government Solutions, LLC***

Stephane Roy  
Project Manager

Attachment A: Groundwater and Air Sampling Results from April 2019

Cc: S. Edwards, NYSDEC  
D. Hesler, NYSDEC  
C. Haas, NYSDEC Region 1  
W. Parish, NYSDEC Region 1  
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer  
S. Karpinski, NYSDOH  
J. Lovejoy, NCDH  
L. Thantu, USEPA Region 2  
G. Ennis, Nassau County Department of Public Works  
S. Urban, Nassau County Department of Public Works  
T. Licata, Town of Oyster Bay  
M. Russo, Town of Oyster Bay  
L. Fly, NAVFAC Mid-Atlantic  
B. Murray, NAVFAC Mid-Atlantic RPM  
G. Pearman, NWIRP Bethpage  
GM-38 Copy

**ATTACHMENT A**  
**GROUNDWATER AND AIR SAMPLING RESULTS**  
**APRIL 2019**

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Discharge Monitoring Report  
April 2019**

| SPDES Parameters               |   |         | April 2019 <sup>(1)</sup> |                     |   |                  |
|--------------------------------|---|---------|---------------------------|---------------------|---|------------------|
| Process Stream                 | Daily Treated Effluent Maximum <sup>(1)</sup> | Units   | RW-1                      | RW-3 <sup>(2)</sup> | Combined Influent <sup>(3)</sup><br>(RW-1 + RW-3) | Treated Effluent |
| Well Depth                     | N/A   | ft      | 445                       | 530                 | N/A   | N/A              |
| Screened Interval              | N/A   | ft bgs  | 335-395<br>410-430        | 392-412<br>442-504  | N/A   | N/A              |
| Sampling Date                  | N/A   |         | 4/3/19                    |                     |   |                  |
| Effective Flowrate             | 1100  | GPM     | 637                       | 169                 | 806   | 855              |
| Total Flow                     | N/A   | gallons | 28,015,378                | 7,432,355           | 35,447,734  | 37,628,461       |
| pH                             | 5.5 - 8.5                                     | SU      | 5.14                      | 5.32                | 5.18  | 6.33             |
| Chloroform                     | 5   | µg/L    | 0.335 J                   | 0.289 J             | 0.33 J  | ND (1.0)         |
| 1,1-Dichloroethane             | 5   | µg/L    | 1.14 J                    | 1.68 J              | 1.25 J  | ND (1.0)         |
| 1,2-Dichloroethane             | 0.6   | µg/L    | ND (1.0)                  | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| 1,1-Dichloroethene             | 5   | µg/L    | 0.876 J                   | 0.987 J             | 0.899 J   | ND (1.0)         |
| cis 1,2-Dichloroethene         | 5   | µg/L    | 4.49 J                    | 1.22 J              | 3.80 J  | ND (1.0)         |
| trans 1,2-Dichloroethene       | 5   | µg/L    | ND (1.0)                  | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| Tetrachloroethene              | 5   | µg/L    | 20.8                      | 0.229 J             | 16.49   | ND (1.0)         |
| 1,1,1-Trichloroethane          | 5   | µg/L    | 0.576 J                   | 0.547 J             | 0.570 J   | ND (1.0)         |
| Trichloroethene                | 5   | µg/L    | 77.3                      | 168                 | 96.3  | ND (1.0)         |
| 1,1,2-Trichlorotrifluoroethane | 5   | µg/L    | ND (1.0)                  | 0.718 J             | 0.15 J  | ND (1.0)         |
| Vinyl Chloride                 | 2   | µg/L    | ND (1.0)                  | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| 1,4-Dioxane                    | --  | µg/L    | 2.1                       | 4.8                 | 2.67  | NS               |
| Mercury                        | 0.00025                                       | mg/L    | ND (0.00010)              | ND (0.00010)        | ND (0.00010)                                      | ND (0.00010)     |
| Total Suspended Solids (TSS)   | N/A   | mg/L    | ND (1.0)                  | 1.5                 | 0.3   | ND (1.0)         |

**Notes:**

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Air Sampling Results  
April 2019**

| DAR Parameters             |                   |                               | April 2019 |             |
|----------------------------|-------------------|-------------------------------|------------|-------------|
| Process Stream             | Units             | Discharge Goal <sup>(1)</sup> | Influent   | Effluent    |
| Sampling Date              |                   |                               | 4/3/19     |             |
| Average Flowrate           | CFM               | N/A                           | NR         | 9,397       |
| Total Flow                 | ft <sup>3</sup>   | N/A                           | NR         | 395,981,738 |
| Total Flow                 | m <sup>3</sup>    | N/A                           | NR         | 11,212,954  |
| 1,2-Dichloroethane         | µg/m <sup>3</sup> | N/A                           | 2.2 J      | ND          |
| cis 1,2-Dichloroethene     | µg/m <sup>3</sup> | ≤ 100,000 <sup>(2)</sup>      | 54         | 72          |
| trans 1,2-Dichloroethene   | µg/m <sup>3</sup> |                               | ND         | ND          |
| 1,2-Dichloroethene (total) | µg/m <sup>3</sup> | ≤ 100,000                     | 56         | 71          |
| Toluene                    | µg/m <sup>3</sup> | N/A                           | 0.36 J     | ND          |
| Total Xylene               | µg/m <sup>3</sup> | N/A                           | ND         | ND          |
| 1,1,2-Trichloroethane      | µg/m <sup>3</sup> | N/A                           | ND         | ND          |
| Trichloroethene            | µg/m <sup>3</sup> | ≤ 2600                        | 1100       | 0.62 J      |
| Vinyl Chloride             | µg/m <sup>3</sup> | ≤ 560                         | 1.3 J      | ND          |
| Tetrachloroethene          | µg/m <sup>3</sup> | ≤ 5100                        | 180        | ND          |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

J - Estimated result between laboratory method detection limit and reporting limit

N/A - Not Applicable

NR - Not recorded

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.



**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Controlled Stack Emissions  
April 2019**

| <b>DAR Parameters</b> | <b>Units</b>    | <b>Discharge Goal <sup>(1)</sup></b> | <b>April 2019</b> |
|-----------------------|-----------------|--------------------------------------|-------------------|
| Sampling Date         |                 |                                      | 4/3/19            |
| Average Flowrate      | CFM             | N/A                                  | 9,397             |
| Total Flow            | ft <sup>3</sup> | N/A                                  | 395,981,738       |
| Total Flow            | m <sup>3</sup>  | N/A                                  | 11,212,954        |
| Trichloroethene       | lb/hr           | ≤ 0.09                               | 0.00002           |
| Vinyl Chloride        | lb/hr           | ≤ 0.02                               | 0.00000           |
| 1,2 Dichloroethene    | lb/hr           | ≤ 11                                 | 0.00244           |
| 1,2-Dichloroethane    | lb/hr           | N/A                                  | 0.00000           |
| Toluene               | lb/hr           | N/A                                  | 0.00000           |
| Total Xylene          | lb/hr           | N/A                                  | 0.00000           |
| 1,1,2-Trichloroethane | lb/hr           | N/A                                  | 0.00000           |
| Tetrachloroethene     | lb/hr           | ≤ 0.18                               | 0.00000           |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

**MAY 2019**



6 June 2019

Mr. Jason Pelton  
New York State Department of Environmental Conservation  
Division of Solid & Hazardous Materials  
625 Broadway  
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT  
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2  
MAY 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 May to 31 May 2019 are presented in Attachment A. In the May reporting period, no significant downtime was recorded for the GM38.

As indicated in Attachment A, all SPDES permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

***KOMAN Government Solutions, LLC***

Stephane Roy  
Project Manager

Attachment A: Groundwater and Air Sampling Results from May 2019

Cc: S. Edwards, NYSDEC  
D. Hesler, NYSDEC  
C. Haas, NYSDEC Region 1  
W. Parish, NYSDEC Region 1  
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer  
S. Karpinski, NYSDOH  
J. Lovejoy, NCDH  
C. Stein, USEPA Region 2  
G. Ennis, Nassau County Department of Public Works  
S. Urban, Nassau County Department of Public Works  
T. Licata, Town of Oyster Bay  
M. Russo, Town of Oyster Bay  
L. Fly, NAVFAC Mid-Atlantic  
B. Murray, NAVFAC Mid-Atlantic RPM  
G. Pearman, NWIRP Bethpage  
GM-38 Copy

**ATTACHMENT A**  
**GROUNDWATER AND AIR SAMPLING RESULTS**  
**MAY 2019**

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Discharge Monitoring Report  
May 2019**

| SPDES Parameters               |   |         | May 2019 <sup>(1)</sup> |                     |   |                  |
|--------------------------------|---|---------|-------------------------|---------------------|---|------------------|
| Process Stream                 | Daily Treated Effluent Maximum <sup>(1)</sup> | Units   | RW-1                    | RW-3 <sup>(2)</sup> | Combined Influent <sup>(3)</sup><br>(RW-1 + RW-3) | Treated Effluent |
| Well Depth                     | N/A   | ft      | 445                     | 530                 | N/A   | N/A              |
| Screened Interval              | N/A   | ft bgs  | 335-395<br>410-430      | 392-412<br>442-504  | N/A   | N/A              |
| Sampling Date                  | N/A   |         | 5/1/19                  |                     |   |                  |
| Effective Flowrate             | 1100  | GPM     | 659                     | 168                 | 827   | 877              |
| Total Flow                     | N/A   | gallons | 29,369,700              | 7,475,300           | 36,845,000  | 39,069,200       |
| pH                             | 5.5 - 8.5                                     | SU      | 5.34                    | 5.07                | 5.29  | 6.39             |
| Chloroform                     | 5   | µg/L    | 0.310 J                 | 0.300 J             | 0.31 J  | ND (1.0)         |
| 1,1-Dichloroethane             | 5   | µg/L    | 1.45 J                  | 2.12 J              | 1.59 J  | ND (1.0)         |
| 1,2-Dichloroethane             | 0.6   | µg/L    | ND (1.0)                | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| 1,1-Dichloroethene             | 5   | µg/L    | 0.880 J                 | 1.11 J              | 0.927 J   | ND (1.0)         |
| cis 1,2-Dichloroethene         | 5   | µg/L    | 4.89 J                  | 1.21 J              | 4.14 J  | ND (1.0)         |
| trans 1,2-Dichloroethene       | 5   | µg/L    | ND (1.0)                | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| Tetrachloroethene              | 5   | µg/L    | 16.0                    | 0.250 J             | 12.80   | ND (1.0)         |
| 1,1,1-Trichloroethane          | 5   | µg/L    | 0.610 J                 | 0.550 J             | 0.598 J   | ND (1.0)         |
| Trichloroethene                | 5   | µg/L    | 63.1                    | 143                 | 79.3  | ND (1.0)         |
| 1,1,2-Trichlorotrifluoroethane | 5   | µg/L    | ND (1.0)                | 0.800 J             | 0.16 J  | ND (1.0)         |
| Vinyl Chloride                 | 2   | µg/L    | ND (1.0)                | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| 1,4-Dioxane                    | --  | µg/L    | 2.1                     | 4.5                 | 2.59  | 2.6              |
| Mercury                        | 0.00025                                       | mg/L    | ND (0.00010)            | ND (0.00010)        | ND (0.00010)                                      | ND (0.00010)     |
| Total Suspended Solids (TSS)   | N/A   | mg/L    | ND (1.0)                | 5.8                 | 1.2   | ND (1.0)         |

**Notes:**

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Air Sampling Results  
May 2019**

| DAR Parameters             |                   |                               | May 2019 |             |
|----------------------------|-------------------|-------------------------------|----------|-------------|
| Process Stream             | Units             | Discharge Goal <sup>(1)</sup> | Influent | Effluent    |
| Sampling Date              |                   |                               | 5/1/19   |             |
| Average Flowrate           | CFM               | N/A                           | NR       | 8,972       |
| Total Flow                 | ft <sup>3</sup>   | N/A                           | NR       | 399,909,108 |
| Total Flow                 | m <sup>3</sup>    | N/A                           | NR       | 11,324,165  |
| 1,2-Dichloroethane         | µg/m <sup>3</sup> | N/A                           | 1.9 J    | ND          |
| cis 1,2-Dichloroethene     | µg/m <sup>3</sup> | ≤ 100,000 <sup>(2)</sup>      | 48       | 79          |
| trans 1,2-Dichloroethene   | µg/m <sup>3</sup> |                               | ND       | ND          |
| 1,2-Dichloroethene (total) | µg/m <sup>3</sup> | ≤ 100,000                     | 48       | 79          |
| Toluene                    | µg/m <sup>3</sup> | N/A                           | ND       | ND          |
| Total Xylene               | µg/m <sup>3</sup> | N/A                           | ND       | ND          |
| 1,1,2-Trichloroethane      | µg/m <sup>3</sup> | N/A                           | ND       | ND          |
| Trichloroethene            | µg/m <sup>3</sup> | ≤ 2600                        | 1100     | 1.3 J       |
| Vinyl Chloride             | µg/m <sup>3</sup> | ≤ 560                         | 1.1 J    | 0.95 J      |
| Tetrachloroethene          | µg/m <sup>3</sup> | ≤ 5100                        | 170      | ND          |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

J - Estimated result between laboratory method detection limit and reporting limit

N/A - Not Applicable

NR - Not recorded

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Controlled Stack Emissions  
May 2019**

| <b>DAR Parameters</b> | <b>Units</b>    | <b>Discharge Goal <sup>(1)</sup></b> | <b>May 2019</b> |
|-----------------------|-----------------|--------------------------------------|-----------------|
| Sampling Date         |                 |                                      | 5/1/19          |
| Average Flowrate      | CFM             | N/A                                  | 8,972           |
| Total Flow            | ft <sup>3</sup> | N/A                                  | 399,909,108     |
| Total Flow            | m <sup>3</sup>  | N/A                                  | 11,324,165      |
| Trichloroethene       | lb/hr           | ≤ 0.09                               | 0.00004         |
| Vinyl Chloride        | lb/hr           | ≤ 0.02                               | 0.00003         |
| 1,2 Dichloroethene    | lb/hr           | ≤ 11                                 | 0.00265         |
| 1,2-Dichloroethane    | lb/hr           | N/A                                  | 0.00000         |
| Toluene               | lb/hr           | N/A                                  | 0.00000         |
| Total Xylene          | lb/hr           | N/A                                  | 0.00000         |
| 1,1,2-Trichloroethane | lb/hr           | N/A                                  | 0.00000         |
| Tetrachloroethene     | lb/hr           | ≤ 0.18                               | 0.00000         |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.



**JUNE 2019**



8 July 2019

Mr. Jason Pelton  
New York State Department of Environmental Conservation  
Division of Solid & Hazardous Materials  
625 Broadway  
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT  
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2  
JUNE 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 June to 30 June 2019 are presented in Attachment A. In the June reporting period, no significant downtime was recorded for the GM38.

As indicated in Attachment A, all SPDES permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

***KOMAN Government Solutions, LLC***

Stephane Roy  
Project Manager

Attachment A: Groundwater and Air Sampling Results from June 2019

Cc: S. Edwards, NYSDEC  
D. Hesler, NYSDEC  
C. Haas, NYSDEC Region 1  
W. Parish, NYSDEC Region 1  
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer  
S. Karpinski, NYSDOH  
J. Lovejoy, NCDH  
C. Stein, USEPA Region 2  
G. Ennis, Nassau County Department of Public Works  
S. Urban, Nassau County Department of Public Works  
T. Licata, Town of Oyster Bay  
M. Russo, Town of Oyster Bay  
L. Fly, NAVFAC Mid-Atlantic  
B. Murray, NAVFAC Mid-Atlantic RPM  
G. Pearman, NWIRP Bethpage  
GM-38 Copy

**ATTACHMENT A**  
**GROUNDWATER AND AIR SAMPLING RESULTS**  
**JUNE 2019**

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Discharge Monitoring Report  
June 2019**

| SPDES Parameters               |   |         | June 2019 <sup>(1)</sup> |                     |   |                  |
|--------------------------------|---|---------|--------------------------|---------------------|---|------------------|
| Process Stream                 | Daily Treated Effluent Maximum <sup>(1)</sup> | Units   | RW-1                     | RW-3 <sup>(2)</sup> | Combined Influent <sup>(3)</sup><br>(RW-1 + RW-3) | Treated Effluent |
| Well Depth                     | N/A   | ft      | 445                      | 530                 | N/A   | N/A              |
| Screened Interval              | N/A   | ft bgs  | 335-395<br>410-430       | 392-412<br>442-504  | N/A   | N/A              |
| Sampling Date                  | N/A   |         | 6/3/19                   |                     |   |                  |
| Effective Flowrate             | 1100  | GPM     | 658                      | 190                 | 849   | 888              |
| Total Flow                     | N/A   | gallons | 28,440,905               | 8,229,550           | 36,670,454  | 38,359,733       |
| pH                             | 5.5 - 8.5                                     | SU      | 5.23                     | 4.99                | 5.18  | 5.92             |
| Chloroform                     | 5   | µg/L    | 0.290 J                  | 0.310 J             | 0.29 J  | ND (1.0)         |
| 1,1-Dichloroethane             | 5   | µg/L    | 1.40 J                   | 2.09 J              | 1.55 J  | ND (1.0)         |
| 1,2-Dichloroethane             | 0.6   | µg/L    | 0.220 J                  | ND (1.0)            | 0.17 J  | ND (1.0)         |
| 1,1-Dichloroethene             | 5   | µg/L    | 0.830 J                  | 0.980 J             | 0.864 J   | ND (1.0)         |
| cis 1,2-Dichloroethene         | 5   | µg/L    | 4.41 J                   | 1.15 J              | 3.68 J  | ND (1.0)         |
| trans 1,2-Dichloroethene       | 5   | µg/L    | ND (1.0)                 | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| Tetrachloroethene              | 5   | µg/L    | 17.8                     | 0.250 J             | 13.86   | ND (1.0)         |
| 1,1,1-Trichloroethane          | 5   | µg/L    | 0.550 J                  | 0.510 J             | 0.541 J   | ND (1.0)         |
| Trichloroethene                | 5   | µg/L    | 65.6                     | 142                 | 82.7  | ND (1.0)         |
| 1,1,2-Trichlorotrifluoroethane | 5   | µg/L    | ND (1.0)                 | 0.650 J             | 0.15 J  | ND (1.0)         |
| Vinyl Chloride                 | 2   | µg/L    | ND (1.0)                 | ND (1.0)            | ND (1.0)  | ND (1.0)         |
| 1,4-Dioxane                    | --  | µg/L    | 1.7                      | 4.1                 | 2.2   | NS               |
| Mercury                        | 0.00025                                       | mg/L    | ND (0.00010)             | ND (0.00010)        | ND (0.00010)                                      | ND (0.00010)     |
| Total Suspended Solids (TSS)   | N/A   | mg/L    | ND (1.0)                 | 6.2                 | 1.4   | ND (1.0)         |

**Notes:**

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Air Sampling Results  
June 2019**

| DAR Parameters             |                   |                               | June 2019 |             |
|----------------------------|-------------------|-------------------------------|-----------|-------------|
| Process Stream             | Units             | Discharge Goal <sup>(1)</sup> | Influent  | Effluent    |
| Sampling Date              |                   |                               | 6/3/19    |             |
| Average Flowrate           | CFM               | N/A                           | NR        | 8,631       |
| Total Flow                 | ft <sup>3</sup>   | N/A                           | NR        | 372,863,970 |
| Total Flow                 | m <sup>3</sup>    | N/A                           | NR        | 10,558,332  |
| 1,2-Dichloroethane         | µg/m <sup>3</sup> | N/A                           | 2.5 J     | ND          |
| cis 1,2-Dichloroethene     | µg/m <sup>3</sup> | ≤ 100,000 <sup>(2)</sup>      | 52        | 79          |
| trans 1,2-Dichloroethene   | µg/m <sup>3</sup> |                               | ND        | 2.1 J       |
| 1,2-Dichloroethene (total) | µg/m <sup>3</sup> | ≤ 100,000                     | 52        | 81          |
| Toluene                    | µg/m <sup>3</sup> | N/A                           | 1.1 J     | ND          |
| Total Xylene               | µg/m <sup>3</sup> | N/A                           | ND        | ND          |
| 1,1,2-Trichloroethane      | µg/m <sup>3</sup> | N/A                           | 2.8 J     | ND          |
| Trichloroethene            | µg/m <sup>3</sup> | ≤ 2600                        | 1100      | 8.3         |
| Vinyl Chloride             | µg/m <sup>3</sup> | ≤ 560                         | 1.1 J     | 0.89 J      |
| Tetrachloroethene          | µg/m <sup>3</sup> | ≤ 5100                        | 180       | ND          |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

J - Estimated result between laboratory method detection limit and reporting limit

N/A - Not Applicable

NR - Not recorded

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.

**GM-38 Area Groundwater Remediation  
Groundwater Treatment Plant  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Controlled Stack Emissions  
June 2019**

| <b>DAR Parameters</b> | <b>Units</b>    | <b>Discharge Goal <sup>(1)</sup></b> | <b>June 2019</b> |
|-----------------------|-----------------|--------------------------------------|------------------|
| Sampling Date         |                 |                                      | 6/3/19           |
| Average Flowrate      | CFM             | N/A                                  | 8,631            |
| Total Flow            | ft <sup>3</sup> | N/A                                  | 372,863,970      |
| Total Flow            | m <sup>3</sup>  | N/A                                  | 10,558,332       |
| Trichloroethene       | lb/hr           | ≤ 0.09                               | 0.00027          |
| Vinyl Chloride        | lb/hr           | ≤ 0.02                               | 0.00003          |
| 1,2 Dichloroethene    | lb/hr           | ≤ 11                                 | 0.00262          |
| 1,2-Dichloroethane    | lb/hr           | N/A                                  | 0.00000          |
| Toluene               | lb/hr           | N/A                                  | 0.00000          |
| Total Xylene          | lb/hr           | N/A                                  | 0.00000          |
| 1,1,2-Trichloroethane | lb/hr           | N/A                                  | 0.00000          |
| Tetrachloroethene     | lb/hr           | ≤ 0.18                               | 0.00000          |

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

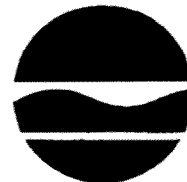
**APPENDIX B**

**NYSDEC AIR DISCHARGE LIMIT  
DOCUMENTATION**

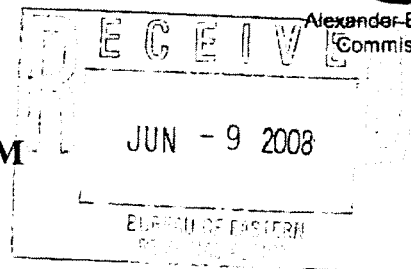


**New York State Department of Environmental Conservation  
Division of Water**

Bureau of Water Permits, 4<sup>th</sup> Floor  
625 Broadway, Albany, New York 12233-3505  
Phone: (518) 402-8111 • FAX: (518) 402-9029  
Website: www.dec.state.ny.us



Alexander B. Grannis  
Commissioner

**MEMORANDUM**

**TO:** Steven Scharf, DER

**FROM:** Jean Occidental, DOW, Bureau of Water Permits JO

**SUBJECT:** Naval Weapons Industrial Reserve Plant (NWIRP); DER Site # 1-01-001

**DRAINAGE BASIN:** na

**DATE:** June 6, 2008

In response to your request and the permittee's SPDES Permit Equivalent Application dated April 27, 2008, attached is the effluent criteria for the above noted groundwater remediation discharge.

The Division of Water does not have any regulatory authority over a discharge from a State, PRP, or Federal Superfund Site. The Division of Environmental Remediation will be responsible for ensuring compliance with the attached effluent criteria and approval of all engineering submissions. Additional Condition (1) identifies the contact to send all effluent results, engineering submissions, and modification requests. The Regional Water Engineer should be kept apprised of the status of these discharges and, in accordance with the attached criteria, receive a copy of the effluent results for informational purposes.

If you have any questions, please call me at (518) 402-8116.

**Attachment**

cc: (w/att) RWE, Region 1  
C. Webber  
BWP Permit Coordinator

Naval Weapons Industrial Reserve Plant

DER site # 1-01-001

Page 1 of 2

## EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning: April 1, 2009and lasting until: April 1, 2014

the discharges from the treatment facility to Groundwater shall be limited and monitored by the operator as specified below:

| Outfall and Parameters   | Limitations |            | Units | Minimum Monitoring Requirements |             |
|--|-------------|------------|-------|---------------------------------|-------------|
|  | Daily Avg.  | Daily Max. |       | Measurement Frequency           | Sample Type |
| Treated Groundwater Remediation Discharge from: Recovery Wells 1, 2, and 3 |             |            |       |                                 |             |
| Flow   | Monitor     | 1100       | GPM   | Continuous                      | Recorder    |
| pH (range)   | 5.5 - 8.5   |            | SU    | Weekly                          | Grab        |
| 1,1-Dichloroethane   | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| 1,2-Dichloroethane   | NA          | 0.6        | µg/l  | Monthly <sup>1</sup>            | Grab        |
| 1,1-Dichloroethene   | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| cis-1,2-Dichloroethene   | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| trans-1,2-Dichloroethene   | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| Tetrachloroethene  | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| 1,1,1-Trichloroethane  | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| Trichloroethene  | NA          | 5          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| Vinyl chloride   | NA          | 2          | µg/l  | Monthly <sup>1</sup>            | Grab        |
| Mercury  | NA          | 0.25       | µg/l  | Monthly <sup>1</sup>            | Grab        |

Footnotes:

- (1) The minimum measurement frequency shall be monthly following a period of 24 consecutive weekly sampling events showing no exceedances of the stated discharge limitations.

Naval Weapons Industrial Reserve Plant

DER site # 1-01-001

Page 1 of 2

Additional Conditions:

- (1) Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by the Department. The discharge rate may not exceed the effective or design treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to:

Steven Scharf  
Division of Environmental Remediation  
NYSDEC, 625 Broadway  
Albany, NY 12233-7015  
Phone: (518) 402-9620

With a copy sent to:

Regional Water Engineer  
NYSDEC - Region 1  
Building 40, SUNY Campus  
Stony Brook, New York 11790-2356  
Phone: (631) 444-0354

- (2) Only site generated wastewater is authorized for treatment and discharge.
- (3) Authorization to discharge is valid only for the period noted above but may be renewed if appropriate. A request for renewal must be received 6 months prior to the expiration date to allow for a review of monitoring data and reassessment of monitoring requirements.
- (4) Any use of corrosion/scale inhibitors, biocidal-type compounds, or other water treatment chemicals used in the treatment process must be approved by the department prior to use.
- (5) This discharge and administration of this discharge must comply with the substantive requirements of 6NYCRR Part 750.

# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau D

625 Broadway, 12th Floor, Albany, NY 12233-7013

P: (518) 402-9676 | F: (518) 402-9773

[www.dec.ny.gov](http://www.dec.ny.gov)

August 31, 2017

Ms. Lora Fly  
Remedial Project Manager  
Naval Facilities Engineering Command  
9324 Virginia Ave.  
Bldg. Z-144, Code OPTE3-6  
Norfolk, VA 23511

Re: SPDES Permit Equivalent Application,  
Naval Weapons Industrial Reserve  
Plant Site (NWIRP), Bethpage.  
NYSDEC Site No 130003B

Lora:

The Department of the Navy (Navy) has requested to renew the State Pollutant Discharge Elimination System (SPDES) effluent for the GM-38 groundwater extraction and treatment system. The New York State Department Environmental Conservation (NYSDEC) has reviewed this request and has established discharge limits for the GM-38 system. These discharge limits, and associated reporting requirements, are detailed in the attached memorandum from the NYSDEC Division of Water.

Thanks and please do not hesitate to contact me at (518) 402-9478 or [jason.pelton@dec.ny.gov](mailto:jason.pelton@dec.ny.gov) with any questions.

Sincerely,

Jason M. Pelton  
Project Manager  
Remedial Section B, Remedial Bureau D  
Division of Environmental Remediation

ec: B. Caldwell, EnSafe/Resolution Consultants  
S. Edwards, NYSDEC  
D. Hesler, NYSDEC  
C. Haas, NYSDEC Region 1  
W. Parish, NYSDEC Region 1  
S. Karpinski, NYSDOH  
J. DeFranco/J. Lovejoy, NCDOH  
L. Thantu, USEPA Region 2

# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water, Bureau of Permits

625 Broadway, Albany, New York 12233-3505

P: (518) 402-8111 | F: (518) 402-9029

www.dec.ny.gov

## MEMORANDUM

**TO:** Jason Pelton, DER  
**FROM:** Robert Wither, Chief, South Permits Section, DOW  
**SUBJECT:** Naval Weapons Industrial Reserve Plant, DER Site #1-30-003B  
**DATE:** August 18, 2017

In response to your request received July 13, 2017, attached please find effluent limitations and monitoring requirements for the above noted remediation discharge.

The DOW does not have any regulatory authority over a discharge from a State, PRP, or Federal Superfund Site. DER will be responsible for ensuring compliance with the attached effluent limitations and monitoring requirements, and approval of all engineering submissions. Footnote 1 identifies the appropriate DER contact as the place to send all effluent results, engineering submissions, and modification requests. The Regional Water Engineer should be kept apprised of the status of this discharge and, in accordance with the attached criteria, receive a copy of the effluent results for informational purposes.

If you have any questions, please call me at 518-402-8123.

Attachment (Effluent Limitations and Monitoring Requirements)

cc: Cathy Haas, RWE, Region 1

**EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

During the period beginning **September 1, 2017** and lasting until **August 31, 2027** the discharges from the wastewater treatment facility to groundwater, Class GA shall be limited and monitored by the operator as specified below:

| Outfall Number and Parameter                 | Discharge Limitations |           | Units | Minimum Monitoring Requirements |             |
|--|-----------------------|-----------|-------|---------------------------------|-------------|
|  | Monthly Avg.          | Daily Max |       | Measurement Frequency           | Sample Type |
| Outfall 001 - Treated Remediation Discharge: |                       |           |       |                                 |             |
| Flow   | Monitor               | 1100      | GPM   | Continuous                      | Recorder    |
| pH (range)                                   | 5.5 - 8.5             |           | SU    | Monthly                         | Grab        |
| 1,1-Dichloroethane                           | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| 1,2-Dichloroethane                           | NA                    | 0.6       | µg/l  | Monthly                         | Grab        |
| 1,1-Dichloroethene                           | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| cis-1,2-Dichloroethene                       | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| trans-1,2-Dichloroethene                     | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| Tetrachloroethene                            | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| 1,1,1-Trichloroethane                        | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| Trichloroethene                              | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| Vinyl Chloride                               | NA                    | 2         | µg/l  | Monthly                         | Grab        |
| Mercury                                      | NA                    | 0.25      | µg/l  | Monthly                         | Grab        |
| Chloroform                                   | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| Trichlorotrifluoroethane (Freon 113)         | NA                    | 5         | µg/l  | Monthly                         | Grab        |
| 1,4 Dioxane                                  | NA                    | Monitor   | µg/l  | Monthly                         | Grab        |

Additional Conditions:

1. The discharge rate may not exceed the effective or design treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to:

Jason Pelton  
Division of Environmental Remediation  
NYSDEC  
625 Broadway  
Albany, New York 12233- 7015  
518-402-9870

With a copy sent to:

Regional Water Engineer, Region 1  
NYSDEC  
SUNY @ Stony Brook  
50 Circle Road  
Stony Brook, NY 11790-3409

2. Only site generated wastewater is authorized for treatment and discharge.
3. Authorization to discharge is valid only for the period noted above but may be renewed if appropriate. A request for renewal must be received 6 months prior to the expiration date to allow for a review of monitoring data and reassessment of monitoring requirements.
4. Both concentration (mg/l or µg/l) and mass loadings (lbs/day) must be reported to the Department for all parameters except flow and pH.
5. Any use of corrosion/scale inhibitors, biocidal-type compounds, or other water treatment chemicals used in the treatment process must be approved by the department prior to use.
6. This discharge and administration of this discharge must comply with the substantive requirements of 6NYCRR Part 750.

**New York State Department of Environmental Conservation**  
**Division of Environmental Remediation**  
**Remedial Action Bureau A, 12<sup>th</sup> Floor**  
625 Broadway, Albany, New York 12233-7015  
Phone: (518) 402-9620 FAX: (518) 402-9022



Joseph Martens  
Commissioner

October 31, 2013

Lora Fly  
Remedial Program Manager  
NAVFAC Mid-Atlantic  
Northeast IPT  
9742 Maryland Avenue  
Norfolk, VA, 23511-3095

RE: Northrop Grumman, Naval Weapons Industrial Reserve Plant (NWIRP) and Grumman Steel Los Sites, NYSDEC Site No.'s I-30-003 A & B.

Dear Ms. Fly:

Tetra Tech NUS Inc., on behalf of the Department of the Navy NAVFAC Midlantic, has submitted an application to remove the GM 38 Area Groundwater Extraction and Treatment system impregnated Xeolite™ resin from the air discharge treatment system. Currently, the air treatment system uses a combined activated carbon with permanganate impregnated resin treatment train. The New York State Department of Environmental Conservation (NYSDEC) has reviewed the Department of the Navy application and concurs with the findings presented.

The routine monitoring, as detailed in Table 1, clearly indicates that vinyl chloride, one of the main contaminants of concern, has diminished to almost non-detect, and discharge concentrations have dropped to below the limit to require air treatment for the other contaminants as well. However, NAVFAC Midlantic is still proposing activated carbon to reduce the other discharge contaminant levels. Therefore, the NYSDEC hereby approves the proposed changes to the GM 38 Area air treatment. The Xeolite™ resin beds will remain in place should reactivation, based on routine monitoring, be required.

If you have any questions in the interim, please contact me at (518)402-9620.

Sincerely,

Steven M. Scharf, P.E.  
Project Engineer  
Remedial Action Bureau A  
Division of Environmental Remediation

EC: J. Swartwout  
S. Scharf  
W. Parish, Region 1  
S. Karpinski, NYSDOH  
E. Hannon, NGC  
D. Stern, Arcadis  
D. Brayack, TTNUS





NOR-01264

November 21, 2011

Mr. Stephen Scharf  
New York Department of Environmental Conservation  
Division of Environmental Remediation  
Bureau of Remedial Action A  
625 Broadway, 11<sup>th</sup> Floor  
Albany, New York 12233-7015

Reference: CLEAN Contract No. N62470-08-D-1001  
Contract Task Order WE06

Subject: Proposed Modification to Discharge Limits for Off Gas Volatile Organic Compounds (VOCs)  
for Air Stripping Tower  
GM-38 Offsite Groundwater Treatment Plant,  
NWIRP Bethpage, New York

Dear Mr. Scharf:

On behalf of the Navy, please find enclosed a copy of the subject document. This document presents an evaluation of current concentrations of off gas VOCs from the GM-38 groundwater treatment plant air-stripping tower (prior to treatment with granular activated carbon). Maximum emission rates were re-evaluated due to decreasing maximum concentrations of target VOCs in un-treated air stripper AS-1 off gas. In addition, breakthrough of target contaminants (e.g., cis-1,2-dichloroethene) is beginning to occur in the granular activated carbon bed. Maximum emission rates were re-evaluated to provide a determination if breakthrough of contaminants would trigger the need for a replacement of the granular activated carbon bed.

Existing Discharge Goals were established in the "Final Operation, Maintenance and Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation" prepared by Tetra Tech EC (April 2010). Existing goals were based on emission estimates for a 95% reduction (see Attachment A), instead of being based on the original DAR-1 analysis of air stripper off gas. Emission estimates were calculated using the air stripper design flow rate of 8,000 cubic feet per minute (cfm), and previous contaminant discharge rates in pounds per hour (lb/hr). Original emission estimates are provided in Attachment B.

Proposed Revised Discharge Goals were calculated using an average flow rate of 9,200 cfm, January to March 2011 VOC loading rates (taken from the Quarterly Operations Report First Quarter 2011 from ECOR Federal Services), and the Actual Annual % of Annual Guideline Concentrations (AGCs), taken from the revised DAR-1 Model Output. The revised DAR-1 Model Output is provided in Attachment C. Existing Discharge Goals and Proposed Revised Discharge Goals are compared in tabular format in the first page of the attachment. Proposed Revised Discharge Goals for trichloroethene (TCE) are the same as previous. The proposed limit for tetrachloroethene (PCE) is approximately 10 times the previous limit, and vinyl chloride is approximately 2 times the previous limit. Revised Discharge Goals for 1,2-dichloroethene (goals are the same for cis-1,2-dichloroethene) are 100 times greater than previously established limits. It is recommended that these revised limits replace previous discharge goals, and treatment of air stripper off gas by granular activated carbon is recommended to continue for TCE and PCE, with no treatment required for vinyl chloride and 1,2-dichloroethene.

If you have any questions please contact Ms. Lora Fly, NAVFAC Mid-LANT, at (757) 341-2012.

Sincerely,



David D. Brayack, P.E.  
Project Manager

Enclosure: (1) Proposed Modification to Discharge Limits for Off Gas Volatile Organic Compounds  
(VOCs) for Air Stripping Tower  
GM-38 Offsite Groundwater Treatment Plant

Distribution:

Mid-Lant, Lora Fly  
NYSDEC (Albany), Henry Wilkie  
NYSDOH (Troy), Steve Karpinski  
NAVAIR, Richard Smith  
USEPA, Carol Stein  
NGC, Kent Smith  
Tetra Tech NUS, Dave Brayack  
ECOR Solutions, Al Taormina  
Administrative Record  
Public Repository  
Project File

Tetra Tech NUS, Inc.

5700 Lake Wright Drive, Suite 309, Norfolk, VA 23502  
Tel 757.461.3768 Fax 757.461.4148 www.ttnus.com

**TABLE 1**  
**COMPARISON OF EXISTING DISCHARGE GOALS WITH ACTUAL EMISSIONS AND PROPOSED DISCHARGE GOALS**  
**AIR STRIPPING TOWER GM-38 OFFSITE GROUNDWATER TREATMENT PLANT**  
**NWIRP BETHPAGE, NEW YORK**

| Chemical                   | Existing Discharge Goal   |   | Actual January to March 2011 Values<br>(Pre-Off Gas Treatment)        |  | Proposed Revised Discharge Goals<br>based on DAR-1 Analysis |  |
|----------------------------|---|---|---|--|---|--|
|                            | Existing Discharge Loading Rate<br>(pounds (lbs)/hour) <sup>(1)</sup> | Equivalent Existing Discharge Goals (µg/m <sup>3</sup> ) <sup>(2)</sup> | Actual Jan-Mar 2011 Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup> | Actual VOC Loading Pre-Off Gas Treatment (lbs/hour) <sup>(4)</sup> | Proposed Discharge Loading Rate (lbs/hour) <sup>(5)</sup>   | Equivalent Proposed Discharge Goal (µg/m <sup>3</sup> ) <sup>(5)</sup> |
| TCE                        | 0.09  | 2,600   | 10,000  | 0.345  | 0.09  | 2,600  |
| PCE                        | 0.02  | 580   | 6,800   | 0.234  | 0.18  | 5,100  |
| Vinyl Chloride             | 0.01  | 290   | 76  | 0.003  | 0.02  | 560  |
| 1,2-Dichloroethene (total) | 0.03  | 870   | 750   | 0.026  | 11  | greater than 100,000   |

**Notes:**

<sup>(1)</sup>Existing Discharge Goals are based on the design flow rate of 8,000 cfm. Existing Discharge Goals were taken from the Final Operations and Maintenance Plan for GM-38 Area Groundwater Remediation from Tetra Tech EC. Existing goals were based on emission estimates for a 95% reduction, and not the previous DAR-1 Analysis. Attachment B (provided at the end of this package) provides the original emission estimates.

<sup>(2)</sup>Existing Discharge Goals were calculated using the actual flow rate of 9,200 cfm and the existing discharge loading rate in pounds per hour (lb/hr).

<sup>(3)</sup>Values were taken from the Quarterly Operations Report First Quarter 2011 from ECOR Federal Services. Values were the maximum effluent concentration in off gas from air stripper stack AS-1 prior to treatment with vapor phase granular activated carbon (GAC), for the months of January, February and March 2011.

<sup>(4)</sup>Actual VOC Loading was calculated using an average flow rate of 9,200 cfm and the January-March 2011 concentrations. Existing off gas treatment consists of two stage vapor phase GAC followed by potassium permanganate zeolite media to provide additional treatment for vinyl chloride.

<sup>(5)</sup>Values were calculated using an average flow rate of 9,200 cfm, and the Actual Annual % of the AGCs from the 2011 DAR-1 Model Output to achieve air quality requirements.

**ATTACHMENT A**  
**2008 AIR PERMIT SUBMITTAL**

# New York State Department of Environmental Conservation Air Permit Application



| DEC ID |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| -      |  |  |  |  |  |  |  |  |  |

| APPLICATION ID |  |  |  |  |  |  |   |  |  |
|----------------|--|--|--|--|--|--|---|--|--|
| -              |  |  |  |  |  |  | / |  |  |

| OFFICE USE ONLY |  |  |  |  |  |  |  |  |  |
|-----------------|--|--|--|--|--|--|--|--|--|
|                 |  |  |  |  |  |  |  |  |  |

## Section I - Certification

| Title V Certification  |                         |
|--|-------------------------|
| I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information [required pursuant to 6 NYCRR 201-6.3(d)] I believe the information is, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. |                         |
| Responsible Official   | Title                   |
| Signature  | Date ____ / ____ / ____ |

| State Facility Certification  |                         |
|---|-------------------------|
| I certify that this facility will be operated in conformance with all provisions of existing regulations. |                         |
| Responsible Official  | Title                   |
| Signature   | Date ____ / ____ / ____ |

## Section II - Identification Information

|   |   |   |  |                                  |                              |                                       |
|---|---|---|--|----------------------------------|------------------------------|---------------------------------------|
| Title V Facility Permit <u>N/A</u>  | <input type="checkbox"/> New                | <input type="checkbox"/> Significant Modification | <input type="checkbox"/> Administrative Amendment                                  | State Facility Permit <u>N/A</u> | <input type="checkbox"/> New | <input type="checkbox"/> Modification |
| <input type="checkbox"/> Renewal  | <input type="checkbox"/> Minor Modification | General Permit Title: _____                       |  | General Permit Title: _____      |                              |                                       |
| <input checked="" type="checkbox"/> Application involves construction of new facility |   |   | <input type="checkbox"/> Application involves construction of new emission unit(s) |                                  |                              |                                       |

| Owner/Firm  |                 |   |  |
|---|-----------------|---|--|
| Name <u>US Navy/NAVFAC Midlant</u>  |                 |   |  |
| Street Address <u>9742 Maryland Ave, Bldg Z-144</u>   |                 |   |  |
| City <u>Norfolk</u>   | State <u>VA</u> | Country <u>US</u>   | Zip <u>23511-3095</u>                          |
| Owner Classification <input checked="" type="checkbox"/> Federal  |                 | <input type="checkbox"/> State <input type="checkbox"/> Municipal |  |
| <input type="checkbox"/> Corporation/Partnership  |                 | <input type="checkbox"/> Individual                               |  |
| Taxpayer ID<br>[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]  |                 |   |  |
| Facility  |                 |   | <input type="checkbox"/> Confidential          |
| Name <u>Naval Weapons Industrial Reserve Plant (NWIRP) GM-38 Area</u>   |                 |   |  |
| Location Address <u>Bethpage</u>  |                 |   |  |
| <input type="checkbox"/> City / <input checked="" type="checkbox"/> Town / <input type="checkbox"/> Village <u>Oyster Bay, New York</u> |                 |   | Zip <u>11714</u>                               |
| Project Description   |                 |   | <input type="checkbox"/> Continuation Sheet(s) |
| <u>Air stripping of groundwater to remove VOCs</u>  |                 |   |  |

| Owner/Firm Contact Mailing Address                  |                 |                          |                       |
|---|-----------------|--------------------------|-----------------------|
| Name (Last, First, Middle Initial) <u>Fly, Lora</u> |                 | Phone No. (757)444-0781  |                       |
| Affiliation <u>Department of the Navy</u>           |                 | Title <u>Remedial PM</u> |                       |
| Street Address <u>9742 Maryland Ave. Bldg Z-144</u> |                 | Fax No. ( )              |                       |
| City <u>Norfolk</u>                                 | State <u>VA</u> | Country <u>US</u>        | Zip <u>23511-3095</u> |
| Facility Contact Mailing Address                    |                 |                          |                       |
| Name (Last, First, Middle Initial) <u>Same</u>      |                 | Phone No. ( )            |                       |
| Affiliation   |                 | Title                    |                       |
| Street Address                                      |                 | Fax No. ( )              |                       |
| City  | State           | Country                  | Zip                   |

New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section III - Facility Information**

| Classification                    |                                      |  |                                     |  |                                  |
|-----------------------------------|--------------------------------------|--|-------------------------------------|--|----------------------------------|
| <input type="checkbox"/> Hospital | <input type="checkbox"/> Residential | <input type="checkbox"/> Educational/Institutional | <input type="checkbox"/> Commercial | <input checked="" type="checkbox"/> Industrial | <input type="checkbox"/> Utility |

| Affected States (Title V Only) N/A     |  |                                       |                                       |                    |  |
|--|--|---------------------------------------|---------------------------------------|--------------------|--|
| <input type="checkbox"/> Vermont       | <input type="checkbox"/> Massachusetts | <input type="checkbox"/> Rhode Island | <input type="checkbox"/> Pennsylvania | Tribal Land: _____ |  |
| <input type="checkbox"/> New Hampshire | <input type="checkbox"/> Connecticut   | <input type="checkbox"/> New Jersey   | <input type="checkbox"/> Ohio         | Tribal Land: _____ |  |

| SIC Codes |  |  |  |  |  |  |  |  |  |
|-----------|--|--|--|--|--|--|--|--|--|
| 9999      |  |  |  |  |  |  |  |  |  |
|           |  |  |  |  |  |  |  |  |  |

| Facility Description  |  | <input type="checkbox"/> Continuation Sheet(s) |
|---|--|--|
| Groundwater Remediation by Air Stripping followed by Vapor-Phase GAC for emission control |  |  |
|   |  |  |
|   |  |  |

| Compliance Statements (Title V Only) N/A   |  |
|--|--|
| <p>I certify that as of the date of this application the facility is in compliance with all applicable requirements: <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at this facility that are operating <u>in compliance</u> with all applicable requirements complete the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those units referenced in the compliance plan portion of Section IV of this application.</li> <li><input type="checkbox"/> For all emission units, subject to any applicable requirements that will become effective during the term of the permit, this facility will meet all such requirements on a timely basis.</li> <li><input type="checkbox"/> Compliance certification reports will be submitted at least once a year. Each report will certify compliance status with respect to each requirement, and the method used to determine the status.</li> </ul> |  |

| Facility Applicable Federal Requirements N/A |        |                              |          |         |              |           |               |        |            | <input type="checkbox"/> Continuation Sheet(s) |
|--|--------|------------------------------|----------|---------|--------------|-----------|---------------|--------|------------|--|
| Title  | Type   | Part                         | Sub Part | Section | Sub Division | Paragraph | Sub Paragraph | Clause | Sub Clause |  |
|  | CERCLA | all substantive requirements |          |         |              |           |               |        |            |  |
|  |        |                              |          |         |              |           |               |        |            |  |
|  |        |                              |          |         |              |           |               |        |            |  |

| Facility State Only Requirements |      |      |          |         |              |           |               |        |            | <input type="checkbox"/> Continuation Sheet(s) |
|----------------------------------|------|------|----------|---------|--------------|-----------|---------------|--------|------------|--|
| Title                            | Type | Part | Sub Part | Section | Sub Division | Paragraph | Sub Paragraph | Clause | Sub Clause |  |
|                                  |      |      |          |         |              |           |               |        |            |  |
|                                  |      |      |          |         |              |           |               |        |            |  |
|                                  |      |      |          |         |              |           |               |        |            |  |



New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information**

|   |   |   |   |   |   |   |   |  |  |  |
|---|---|---|---|---|---|---|---|--|--|--|
| <b>Emission Unit Description</b>  |   |   |   |   |   |   |   |  |  | <input type="checkbox"/> Continuation Sheet(s) |
| EMISSION UNIT   | 0 | - | 0 | 0 | E | U | 1 |  |  |  |
| Air Stripper AS-1 for groundwater remediation, provided with activated carbon for emission control.   |   |   |   |   |   |   |   |  |  |  |
| The emission point is stack 00ST-1. The 2-stage VGAC is followed by a 3rd vessel containing a potassium permanganate zeolite media for increased VC capacity. |   |   |   |   |   |   |   |  |  |  |

|                 |                 |  |             |            |  |
|-----------------|-----------------|--|-------------|------------|--|
| <b>Building</b> |                 |  |             |            | <input type="checkbox"/> Continuation Sheet(s) |
| Building        | Building Name   |  | Length (ft) | Width (ft) | Orientation                                    |
| BLDG-1          | Treatment Plant |  | 75          | 75         | 0  |
|                 |                 |  |             |            |  |
|                 |                 |  |             |            |  |

|                       |                  |                             |                      |                 |                                |                 |  |
|-----------------------|------------------|-----------------------------|----------------------|-----------------|--------------------------------|-----------------|--|
| <b>Emission Point</b> |                  |                             |                      |                 |                                |                 | <input type="checkbox"/> Continuation Sheet(s) |
| EMISSION PT.          | 00ST1            |                             |                      |                 |                                |                 |  |
| Ground Elev. (ft)     | Height (ft)      | Height Above Structure (ft) | Inside Diameter (in) | Exit Temp. (°F) | Cross Section                  |                 |  |
| 90                    | 40               | 15                          | 36                   | 80              | Length (in)                    | Width (in)      |  |
| Exit Velocity (FPS)   | Exit Flow (ACFM) | NYTM (E) (KM)               | NYTM (N) (KM)        | Building        | Distance to Property Line (ft) | Date of Removal |  |
| 19                    | 8020             |                             |                      | BLDG-1          | 50                             |                 |  |
| EMISSION PT.          |                  |                             |                      |                 |                                |                 |  |
| Ground Elev. (ft)     | Height (ft)      | Height Above Structure (ft) | Inside Diameter (in) | Exit Temp. (°F) | Cross Section                  |                 |  |
|                       |                  |                             |                      |                 | Length (in)                    | Width (in)      |  |
| Exit Velocity (FPS)   | Exit Flow (ACFM) | NYTM (E) (KM)               | NYTM (N) (KM)        | Building        | Distance to Property Line (ft) | Date of Removal |  |
|                       |                  |                             |                      |                 |                                |                 |  |

|                                |                       |                      |                   |                 |              |                      |  |
|--------------------------------|-----------------------|----------------------|-------------------|-----------------|--------------|----------------------|--|
| <b>Emission Source/Control</b> |                       |                      |                   |                 |              |                      | <input type="checkbox"/> Continuation Sheet(s) |
| Emission Source                |                       | Date of Construction | Date of Operation | Date of Removal | Control Type |                      | Manufacturer's Name/Model No.                  |
| ID                             | Type                  |                      |                   |                 | Code         | Description          |  |
| AS-1                           | I                     |                      |                   |                 | 048          | Granular Act. Carbon | Air Stripping Column                           |
| Design Capacity                | Design Capacity Units |                      |                   | Waste Feed      |              | Waste Type           |  |
|                                | Code                  | Description          |                   | Code            | Description  | Code                 | Description                                    |
|                                |                       |                      |                   |                 |              |                      |  |
| Emission Source                |                       | Date of Construction | Date of Operation | Date of Removal | Control Type |                      | Manufacturer's Name/Model No.                  |
| ID                             | Type                  |                      |                   |                 | Code         | Description          |  |
|                                |                       |                      |                   |                 |              |                      |  |
| Design Capacity                | Design Capacity Units |                      |                   | Waste Feed      |              | Waste Type           |  |
|                                | Code                  | Description          |                   | Code            | Description  | Code                 | Description                                    |
|                                |                       |                      |                   |                 |              |                      |  |



New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information (continued)**

|  |  |                    |             |                        |             |                |  |         |  |  |  |
|--|--|--------------------|-------------|------------------------|-------------|----------------|--|---------|--|--|--|
| Process Information  |  |                    |             |                        |             |                |  |         |  | <input type="checkbox"/> Continuation Sheet(s) |  |
| EMISSION UNIT 0 - 00 E U 1   |  |                    |             |                        |             |                |  | PROCESS |  | PR 1   |  |
| Description  |  |                    |             |                        |             |                |  |         |  |  |  |
| The remedial system is air stripping, using a packed column at a groundwater flow rate of 1,100 gpm (plus 100 gpm recycle, for a total of 1,200 gpm). Vapor phase treatment includes the use of 3 vessels, a 2-stage GAC unit, followed by a 3rd vessel containing a potassium permanganate impregnated zeolite for increased VC capacity. Prior to entering the vapor-phase GAC adsorption system, the humidity of the air stripper exhaust is reduced to approximately 50 percent or less to optimize the efficiency of the vapor-phase GAC. |  |                    |             |                        |             |                |  |         |  |  |  |
| Air Stripper AS-1: Existing. Type: Vertical, Cylindrical Construction: Aluminum  |  |                    |             |                        |             |                |  |         |  |  |  |
| Packing: 25-foot Jaeger Tripack. Dimensions: 10.0 ft. Dia x 47 ft. H   |  |                    |             |                        |             |                |  |         |  |  |  |
| Source Classification Code (SCC)   |  | Total Thruput      |             | Thruput Quantity Units |             |                |  |         |  |  |  |
|  |  | Quantity/Hr        | Quantity/Yr | Code                   | Description |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
| <input type="checkbox"/> Confidential<br><input checked="" type="checkbox"/> Operating at Maximum Capacity<br><input type="checkbox"/> Activity with Insignificant Emissions   |  | Operating Schedule |             | Building               |             | Floor/Location |  |         |  |  |  |
|  |  | Hrs/Day            | Days/Yr     |                        |             |                |  |         |  |  |  |
|  |  | 24                 | 365         | BLDG-1                 |             | Main           |  |         |  |  |  |
| Emission Source/Control Identifier(s)  |  |                    |             |                        |             |                |  |         |  |  |  |
| AS-1   |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
| EMISSION UNIT -  |  |                    |             |                        |             |                |  | PROCESS |  |  |  |
| Description  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
| Source Classification Code (SCC)   |  | Total Thruput      |             | Thruput Quantity Units |             |                |  |         |  |  |  |
|  |  | Quantity/Hr        | Quantity/Yr | Code                   | Description |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
| <input type="checkbox"/> Confidential<br><input type="checkbox"/> Operating at Maximum Capacity<br><input type="checkbox"/> Activity with Insignificant Emissions  |  | Operating Schedule |             | Building               |             | Floor/Location |  |         |  |  |  |
|  |  | Hrs/Day            | Days/Yr     |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
| Emission Source/Control Identifier(s)  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |
|  |  |                    |             |                        |             |                |  |         |  |  |  |

New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information (continued)**

| Emission Unit | Emission Point | Process | Emission Source | Emission Unit Applicable Federal Requirements |      |      |          |         |              |        |            |        |            | <input type="checkbox"/> Continuation Sheet(s) |  |
|---------------|----------------|---------|-----------------|---|------|------|----------|---------|--------------|--------|------------|--------|------------|--|--|
|               |                |         |                 | Title   | Type | Part | Sub Part | Section | Sub Division | Parag. | Sub Parag. | Clause | Sub Clause |  |  |
| -             |                |         |                 |   |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |   |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |   |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |   |      |      |          |         |              |        |            |        |            |  |  |

| Emission Unit | Emission Point | Process | Emission Source | Emission Unit State Only Requirements |      |      |          |         |              |        |            |        |            | <input type="checkbox"/> Continuation Sheet(s) |  |
|---------------|----------------|---------|-----------------|---------------------------------------|------|------|----------|---------|--------------|--------|------------|--------|------------|--|--|
|               |                |         |                 | Title                                 | Type | Part | Sub Part | Section | Sub Division | Parag. | Sub Parag. | Clause | Sub Clause |  |  |
| -             |                |         |                 |                                       |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |                                       |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |                                       |      |      |          |         |              |        |            |        |            |  |  |
| -             |                |         |                 |                                       |      |      |          |         |              |        |            |        |            |  |  |

| Emission Unit Compliance Certification  |                |                             |                            |  |              |                        |                       |                                  |            |  | <input type="checkbox"/> Continuation Sheet(s) |
|---|----------------|-----------------------------|----------------------------|--|--------------|------------------------|-----------------------|----------------------------------|------------|--|--|
| <b>Rule Citation</b>  |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
| Title   | Type           | Part                        | Sub Part                   | Section  | Sub Division | Paragraph              | Sub Paragraph         | Clause                           | Sub Clause |  |  |
| 6   | NYCRR          | 212                         |                            |  |              |                        |                       |                                  |            |  |  |
| <input checked="" type="checkbox"/> Applicable Federal Requirement  |                |                             |                            | <input type="checkbox"/> State Only Requirement  |              |                        |                       | <input type="checkbox"/> Capping |            |  |  |
| Emission Unit   | Emission Point | Process                     | Emission Source            | CAS No.  |              |                        | Contaminant Name      |                                  |            |  |  |
| 0-00EU1   | 00ST1          | PR1                         | AS-1                       | 00079 - 01 - 6   |              |                        | Trichloroethylene     |                                  |            |  |  |
| <b>Monitoring Information</b>   |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
| <input type="checkbox"/> Continuous Emission Monitoring   |                |                             |                            | <input type="checkbox"/> Monitoring of Process or Control Device Parameters as Surrogate |              |                        |                       |                                  |            |  |  |
| <input checked="" type="checkbox"/> Intermittent Emission Testing   |                |                             |                            | <input type="checkbox"/> Work Practice Involving Specific Operations                     |              |                        |                       |                                  |            |  |  |
| <input type="checkbox"/> Ambient Air Monitoring   |                |                             |                            | <input type="checkbox"/> Record Keeping/Maintenance Procedures                           |              |                        |                       |                                  |            |  |  |
| <b>Description</b>  |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
| Monthly grab samples analyzed for VOCs from the vapor phase treatment system influent, effluent and two intermediate locations. |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
|   |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
| Work Practice   |                | Process Material            |                            |  |              |                        | Reference Test Method |                                  |            |  |  |
| Type  | Code           | Description                 |                            |  |              |                        |                       |                                  |            |  |  |
|   |                |                             |                            |  |              |                        |                       |                                  |            |  |  |
| Parameter   |                | Manufacturer Name/Model No. |                            |  |              |                        |                       |                                  |            |  |  |
| Code  | Description    |                             |                            |  |              |                        |                       |                                  |            |  |  |
| 23  | Concentration  |                             |                            |  |              |                        |                       |                                  |            |  |  |
| Limit   |                |                             | Limit Units                |  |              |                        |                       |                                  |            |  |  |
| Upper   | Lower          | Code                        | Description                |  |              |                        |                       |                                  |            |  |  |
| 3,125   |                | 255                         | micrograms per cubic meter |  |              |                        |                       |                                  |            |  |  |
| Averaging Method  |                |                             | Monitoring Frequency       |  |              | Reporting Requirements |                       |                                  |            |  |  |
| Code  | Description    | Code                        | Description                | Code   | Description  |                        |                       |                                  |            |  |  |
| 01  | Instantaneous  | 05                          | Monthly                    | 10   | Upon Request |                        |                       |                                  |            |  |  |

New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information (continued)**

|  |                      |                  |                |                    |              |                 |               |  |            |   |
|--|----------------------|------------------|----------------|--------------------|--------------|-----------------|---------------|--|------------|---|
| Determination of Non-Applicability (Title V Only) N/A <input type="checkbox"/> Continuation Sheet(s) |                      |                  |                |                    |              |                 |               |  |            |   |
| Rule Citation  |                      |                  |                |                    |              |                 |               |  |            |   |
| Title  | Type                 | Part             | Sub Part       | Section            | Sub Division | Paragraph       | Sub Paragraph | Clause   | Sub Clause |   |
| Emission Unit  |                      | Emission Point   |                | Process            |              | Emission Source |               | <input type="checkbox"/> Applicable Federal Requirement<br><input type="checkbox"/> State Only Requirement |            |   |
| Description  |                      |                  |                |                    |              |                 |               |  |            |   |
|  |                      |                  |                |                    |              |                 |               |  |            |   |
|  |                      |                  |                |                    |              |                 |               |  |            |   |
| Rule Citation  |                      |                  |                |                    |              |                 |               |  |            |   |
| Title  | Type                 | Part             | Sub Part       | Section            | Sub Division | Paragraph       | Sub Paragraph | Clause   | Sub Clause |   |
| Emission Unit  |                      | Emission Point   |                | Process            |              | Emission Source |               | <input type="checkbox"/> Applicable Federal Requirement<br><input type="checkbox"/> State Only Requirement |            |   |
| Description  |                      |                  |                |                    |              |                 |               |  |            |   |
|  |                      |                  |                |                    |              |                 |               |  |            |   |
|  |                      |                  |                |                    |              |                 |               |  |            |   |
| Process Emissions Summary <input type="checkbox"/> Continuation Sheet(s)                             |                      |                  |                |                    |              |                 |               |  |            |   |
| EMISSION UNIT  | 0 - 0 0 E U 1        |                  |                |                    |              |                 | PROCESS       | P  | R          | 1 |
| CAS No.  | Contaminant Name     |                  |                | % Thruput          | % Capture    | % Control       | ERP (lbs/hr)  | ERP How Determined   |            |   |
| 0079 - 01 - 6  | Trichloroethylene    |                  |                |                    |              | 95              | 1.87          | 02   |            |   |
| PTE  |                      |                  | Standard Units | PTE How Determined |              | Actual          |               |  |            |   |
| (lbs/hr)   | (lbs/yr)             | (standard units) |                |                    |              | (lbs/hr)        | (lbs/yr)      |  |            |   |
| 0.09   | 99                   |                  |                | 02                 |              |                 |               |  |            |   |
| EMISSION UNIT  | 0 - 0 0 E U 1        |                  |                |                    |              |                 | PROCESS       | P  | R          | 1 |
| CAS No.  | Contaminant Name     |                  |                | % Thruput          | % Capture    | % Control       | ERP (lbs/hr)  | ERP How Determined   |            |   |
| 00075 - 01 - 4   | Vinyl Chloride       |                  |                |                    |              | 95              | 0.17          | 03   |            |   |
| PTE  |                      |                  | Standard Units | PTE How Determined |              | Actual          |               |  |            |   |
| (lbs/hr)   | (lbs/yr)             | (standard units) |                |                    |              | (lbs/hr)        | (lbs/yr)      |  |            |   |
| 0.01   | 3.7                  |                  |                | 02                 |              |                 |               |  |            |   |
| EMISSION UNIT  | 0 - 0 0 E U 1        |                  |                |                    |              |                 | PROCESS       | P  | R          | 1 |
| CAS No.  | Contaminant Name     |                  |                | % Thruput          | % Capture    | % Control       | ERP (lbs/hr)  | ERP How Determined   |            |   |
| 000540 - 59 - 0  | 1,2-Dichloroethylene |                  |                |                    |              | 95              | 0.6           | 02   |            |   |
| PTE  |                      |                  | Standard Units | PTE How Determined |              | Actual          |               |  |            |   |
| (lbs/hr)   | (lbs/yr)             | (standard units) |                |                    |              | (lbs/hr)        | (lbs/yr)      |  |            |   |
| 0.03   | 7.3                  |                  |                | 02                 |              |                 |               |  |            |   |

New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information (continued)**

| EMISSION UNIT  |                           | Emission Unit Emissions Summary |          |          |   | <input type="checkbox"/> Continuation Sheet(s) |
|----------------|---------------------------|---------------------------------|----------|----------|---|--|
| 0              | -                         | 0                               | 0        | E        | U | 1  |
| CAS No.        |                           | Contaminant Name                |          |          |   |  |
| 00107- 06 - 2  |                           | 1,2-Dichloroethane              |          |          |   |  |
| ERP (lbs/yr)   | PTE Emissions             |                                 | Actual   |          |   |  |
|                | (lbs/hr)                  | (lbs/yr)                        | (lbs/hr) | (lbs/yr) |   |  |
| 13.4           | Below Reporting Threshold |                                 | BRT      |          |   |  |
| CAS No.        |                           | Contaminant Name                |          |          |   |  |
| 00108 - 88 - 3 |                           | Toluene                         |          |          |   |  |
| ERP (lbs/yr)   | PTE Emissions             |                                 | Actual   |          |   |  |
|                | (lbs/hr)                  | (lbs/yr)                        | (lbs/hr) | (lbs/yr) |   |  |
| 72.7           | BRT                       |                                 | BRT      |          |   |  |
| CAS No.        |                           | Contaminant Name                |          |          |   |  |
| 01330- 20 - 7  |                           | Xylene                          |          |          |   |  |
| ERP (lbs/yr)   | PTE Emissions             |                                 | Actual   |          |   |  |
|                | (lbs/hr)                  | (lbs/yr)                        | (lbs/hr) | (lbs/yr) |   |  |
| 77.1           | BRT                       |                                 | BRT      |          |   |  |
| CAS No.        |                           | Contaminant Name                |          |          |   |  |
| -              |                           | 1,1,2-Trichloroethane           |          |          |   |  |
| ERP (lbs/yr)   | PTE Emissions             |                                 | Actual   |          |   |  |
|                | (lbs/hr)                  | (lbs/yr)                        | (lbs/hr) | (lbs/yr) |   |  |
|                | BRT                       |                                 | BRT      |          |   |  |

| Compliance Plan   |         |                 |  |      |      |          |         |              |        |            |        |                | <input type="checkbox"/> Continuation Sheet(s) |
|---|---------|-----------------|--|------|------|----------|---------|--------------|--------|------------|--------|----------------|--|
| For any emission units which are <u>not in compliance</u> at the time of permit application, the applicant shall complete the following |         |                 |  |      |      |          |         |              |        |            |        |                |  |
| Consent Order   |         |                 | Certified progress reports are to be submitted every 6 months beginning ____ / ____ / ____ |      |      |          |         |              |        |            |        |                |  |
| Emission Unit   | Process | Emission Source | Applicable Federal Requirement   |      |      |          |         |              |        |            |        |                |  |
|   |         |                 | Title  | Type | Part | Sub Part | Section | Sub Division | Parag. | Sub Parag. | Clause | Sub Clause     |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
| Remedial Measure / Intermediate Milestones  |         |                 |  |      |      |          |         |              |        |            | R/I    | Date Scheduled |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |
|   |         |                 |  |      |      |          |         |              |        |            |        |                |  |

New York State Department of Environmental Conservation  
Air Permit Application



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

**Section IV - Emission Unit Information (continued)**

|  |  |                  |  |  |  |  |        |        |  |
|--|--|------------------|--|--|--|--|--------|--------|--|
| Request for Emission Reduction Credits   |  |                  |  |  |  | <input type="checkbox"/> Continuation Sheet(s) |        |        |  |
| EMISSION UNIT -  |  |                  |  |  |  |  |        |        |  |
| Emission Reduction Description   |  |                  |  |  |  |  |        |        |  |
| Contaminant Emission Reduction Data  |  |                  |  |  |  |  |        |        |  |
| Baseline Period ____ / ____ / ____ to ____ / ____ / ____   |  |                  |  |  |  | Reduction                                      |        |        |  |
|  |  |                  |  |  |  | Date   | Method |        |  |
|  |  |                  |  |  |  | ____ / ____ / ____                             |        |        |  |
| CAS No.  |  | Contaminant Name |  |  |  | ERC (lbs/yr)                                   |        |        |  |
|  |  |                  |  |  |  | Netting  |        | Offset |  |
| -  |  |                  |  |  |  |  |        |        |  |
| -  |  |                  |  |  |  |  |        |        |  |
| -  |  |                  |  |  |  |  |        |        |  |
| Facility to Use Future Reduction   |  |                  |  |  |  |  |        |        |  |
| Name   |  |                  |  |  |  | APPLICATION ID                                 |        |        |  |
|  |  |                  |  |  |  | - / - / - / - / - / - / - / - / - / -          |        |        |  |
| Location Address   |  |                  |  |  |  |  |        |        |  |
| <input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village |  |                  |  |  |  | State  |        | Zip    |  |

|  |         |                  |  |  |              |  |        |     |  |
|--|---------|------------------|--|--|--------------|--|--------|-----|--|
| Use of Emission Reduction Credits  |         |                  |  |  |              | <input type="checkbox"/> Continuation Sheet(s) |        |     |  |
| EMISSION UNIT -  |         |                  |  |  |              |  |        |     |  |
| Proposed Project Description   |         |                  |  |  |              |  |        |     |  |
| Contaminant Emissions Increase Data  |         |                  |  |  |              |  |        |     |  |
| CAS No.  |         | Contaminant Name |  |  |              | PEP (lbs/yr)                                   |        |     |  |
| -  |         |                  |  |  |              |  |        |     |  |
| Statement of Compliance  |         |                  |  |  |              |  |        |     |  |
| <input type="checkbox"/> All facilities under the ownership of this "ownership/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order. |         |                  |  |  |              |  |        |     |  |
| Source of Emission Reduction Credit - Facility   |         |                  |  |  |              |  |        |     |  |
| Name   |         |                  |  |  |              | PERMIT ID                                      |        |     |  |
|  |         |                  |  |  |              | - / - / - / - / - / - / - / - / - / -          |        |     |  |
| Location Address   |         |                  |  |  |              |  |        |     |  |
| <input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village   |         |                  |  |  |              | State  |        | Zip |  |
| Emission Unit  | CAS No. | Contaminant Name |  |  | ERC (lbs/yr) |  |        |     |  |
|  |         |                  |  |  | Netting      |  | Offset |     |  |
| -  | -       |                  |  |  |              |  |        |     |  |
| -  | -       |                  |  |  |              |  |        |     |  |
| -  | -       |                  |  |  |              |  |        |     |  |



|        |  |  |  |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|--|--|
| DEC ID |  |  |  |  |  |  |  |  |  |
| -      |  |  |  |  |  |  |  |  |  |

Supporting Documentation

- P.E. Certification (form attached)
- List of Exempt Activities (form attached)
- Plot Plan
- Methods Used to Determine Compliance (form attached)
- Calculations
- Air Quality Model ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Confidentiality Justification
- Ambient Air Monitoring Plan ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Stack Test Protocols/Reports ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Continuous Emissions Monitoring Plans/QA/QC ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- MACT Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Operational Flexibility: Description of Alternative Operating Scenarios and Protocols
- Title IV: Application/Registration
- ERC Quantification (form attached)
- Use of ERC(s) (form attached)
- Baseline Period Demonstration
- Analysis of Contemporaneous Emission Increase/Decrease
- LAER Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- BACT Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Other Document(s): \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
 \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )

**ATTACHMENT B**

**2008 EMISSION ESTIMATES BASED ON 95% REMOVAL**

**ATTACHMENT 1  
Emission Estimate**

POTENTIAL EMISSION ESTIMATES,  
USED TO DEVELOP 95% REDUCTION  
OF EMISSION VALUES AS BASED ON  
INFLUENT GROUNDWATER CONCENTRATIONS  
(95% REDUCTION OF EMISSION  
VALUES ARE PROVIDED  
ON PAGE 7 OF THE 2008 AIR  
PERMIT APPLICATION PROCESS  
EMISSIONS SUMMARY)

Feed Water Flow 1,100 gpm: max or normal  
250 m<sup>3</sup>/hr  
Water Flow Including Recycle 1,200 gpm: max or normal  
273 m<sup>3</sup>/hr  
Air Flow 8,000 cfm  
13,592 m<sup>3</sup>/hr  
A/W vol ratio 50

EXAMPLE EMISSION CALC: Vinyl Chloride  
4.8 ug/L x 1000 L/m<sup>3</sup> x 250 m<sup>3</sup> water/13,623 m<sup>3</sup> air = 88 ug/m<sup>3</sup>

16

| Name                                       | CAS Number | Toxicity:<br>H/M/L <sup>2</sup> | VOC <sup>3</sup> | HAP <sup>4</sup> | GW Conc. <sup>1</sup> |          | Effluent Conc. <sup>1</sup> |          | Uncontrolled Stripper Exhaust |            |           |           |            |            |                       |                       |
|--|------------|---------------------------------|------------------|------------------|-----------------------|----------|-----------------------------|----------|-------------------------------|------------|-----------|-----------|------------|------------|-----------------------|-----------------------|
|  |            |                                 |                  |                  | Max ug/L              | Avg ug/L | Max ug/L                    | Avg ug/L | Max lb/day                    | Avg lb/day | Max lb/hr | Avg lb/hr | Max gm/sec | Avg gm/sec | Max ug/m <sup>3</sup> | Avg ug/m <sup>3</sup> |
| 1,1,1-Trichloroethane (Methyl Chloroform)  | 00071-55-6 | L                               | No               | Yes              | 3                     | 3.0      |                             |          | 0.04                          | 0.04       | 0.00      | 0.00      | 2.08E-04   | 2.08E-04   | 55                    | 55                    |
| 1,1,2-Trichloroethane                      | 00079-00-5 | M                               | Yes              | Yes              | 3.5                   | 0.3      |                             |          | 0.05                          | 0.00       | 0.00      | 0.00      | 2.43E-04   | 2.08E-05   | 64                    | 6                     |
| 1,1-Dichloroethane                         | 00075-34-3 | L                               | Yes              | Yes              | 4                     | 0.7      |                             |          | 0.05                          | 0.01       | 0.00      | 0.00      | 2.77E-04   | 4.85E-05   | 74                    | 13                    |
| 1,2-Dichloroethane                         | 00107-06-2 | M                               | Yes              | Yes              | 3                     | 1.0      | 0.3                         | 0.1      | 0.04                          | 0.01       | 0.00      | 0.00      | 1.87E-04   | 6.24E-05   | 55                    | 18                    |
| 1,1-Dichloroethylene (Vinylidene Chloride) | 00075-35-4 | M                               | Yes              | Yes              | 9                     | 1.6      |                             |          | 0.12                          | 0.02       | 0.00      | 0.00      | 6.24E-04   | 1.11E-04   | 165                   | 29                    |
| 1,2-Dichloroethylene                       | 00540-59-0 | M                               | Yes              | No               | 1,100                 | 31.5     | 1.3                         | 0.0      | 14.51                         | 0.42       | 0.60      | 0.02      | 7.62E-02   | 2.18E-03   | 20,219                | 579                   |
| Benzene                                    | 00071-43-2 | H                               | Yes              | Yes              | 4                     | 0.1      |                             |          | 0.05                          | 0.00       | 0.00      | 0.00      | 2.77E-04   | 6.94E-06   | 74                    | 2                     |
| Carbon Tetrachloride                       | 00056-23-5 | H                               | Yes              | Yes              | 4                     | 0.1      |                             |          | 0.05                          | 0.00       | 0.00      | 0.00      | 2.77E-04   | 6.94E-06   | 74                    | 2                     |
| Chlorobenzene (Monochlorobenzene)          | 00108-90-7 | M                               | Yes              | Yes              | 1                     | 0.1      |                             |          | 0.01                          | 0.00       | 0.00      | 0.00      | 6.94E-05   | 6.94E-06   | 18                    | 2                     |
| Chloroform                                 | 00067-66-3 | M                               | Yes              | Yes              | 2                     | 0.8      |                             |          | 0.03                          | 0.01       | 0.00      | 0.00      | 1.39E-04   | 5.55E-05   | 37                    | 15                    |
| Methyl Tert Butyl Ether                    | 01634-04-4 | M                               | Yes              | Yes              | 2                     | 0.1      |                             |          | 0.03                          | 0.00       | 0.00      | 0.00      | 1.39E-04   | 6.94E-06   | 37                    | 2                     |
| Tetrachloroethylene                        | 00127-18-4 | M                               | Yes              | Yes              | 900                   | 33.8     | 0.9                         | 0.0      | 11.88                         | 0.45       | 0.49      | 0.02      | 6.24E-02   | 2.34E-03   | 16,543                | 621                   |
| Toluene                                    | 00108-88-3 | L                               | Yes              | Yes              | 15                    | 0.7      |                             |          | 0.20                          | 0.01       | 0.01      | 0.00      | 1.04E-03   | 4.85E-05   | 276                   | 13                    |
| Trichloroethylene                          | 00079-01-6 | M                               | Yes              | Yes              | 3,400                 | 411.5    | 4.5                         | 0.5      | 44.86                         | 5.43       | 1.87      | 0.23      | 2.35E-01   | 2.85E-02   | 62,494                | 7,564                 |
| Vinyl chloride                             | 00075-01-4 | H                               | Yes              | Yes              | 300                   | 4.8      | 0.0                         | 0.0      | 3.96                          | 0.06       | 0.17      | 0.00      | 2.08E-02   | 3.33E-04   | 5,514                 | 88                    |
| Xylenes                                    | 01330-20-7 | M                               | Yes              | Yes              | 16                    | 0.2      |                             |          | 0.21                          | 0.00       | 0.01      | 0.00      | 1.11E-03   | 1.39E-05   | 294                   | 4                     |
| Total VOCs                                 |            |                                 |                  |                  | 5,764                 | 487.3    | 7.0                         | 0.6      | 76.05                         | 6.43       | 3.17      | 0.27      |            |            |                       |                       |
| Total HAPs                                 |            |                                 |                  |                  | 4,667                 | 458.8    | 5.7                         | 0.6      | 61.57                         | 6.05       | 2.57      | 0.25      |            |            |                       |                       |

Total Uncontrolled VOC 2,347 lb/yr  
Total Uncontrolled HAP 2,209 lb/yr

1. Source: "GM-38 Groundwater Remedy Analysis Report", February 2003
2. Source: DAR-1 AGC/SGC Tables, NYSDEC Division of Air Resources, Air Toxics Section, September 10, 2007.
3. Source: 6 NYCRR Part 200.1(cg)
4. Source: 6 NYCRR Part 200.1(ag)



**ATTACHMENT 1  
Emission Estimate**

Feed Water Flow 1,100 gpm: max or normal  
250 m<sup>3</sup>/hr  
Water Flow Including Recycle 1,200 gpm: max or normal  
273 m<sup>3</sup>/hr  
Air Flow 8,000 cfm  
13,592 m<sup>3</sup>/hr  
A/W vol ratio 50

Controlled Stripper Exhat

| Name                                       | CAS Number | Toxicity:<br>H/M/L <sup>2</sup> | VOC <sup>3</sup> | HAP <sup>4</sup> | Control by | Max                  | Avg    | Max       | Avg      |
|--|------------|---------------------------------|------------------|------------------|------------|----------------------|--------|-----------|----------|
|  |            |                                 |                  |                  | GAC        | lb/day               | lb/day | gm/sec    | gm/sec   |
| 1,1,1-Trichloroethane (Methyl Chloroform)  | 00071-55-6 | L                               | No               | Yes              | 95%        | 0.00                 | 0.00   | 1.04E-05  | 1.04E-05 |
| 1,1,2-Trichloroethane                      | 00079-00-5 | M                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 1.21E-05  | 1.04E-06 |
| 1,1-Dichloroethane                         | 00075-34-3 | L                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 1.39E-05  | 2.43E-06 |
| 1,2-Dichloroethane                         | 00107-06-2 | M                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 9.36E-06  | 3.12E-06 |
| 1,1-Dichloroethylene (Vinylidene Chloride) | 00075-35-4 | M                               | Yes              | Yes              | 95%        | 0.01                 | 0.00   | 3.12E-05  | 5.55E-06 |
| 1,2-Dichloroethylene                       | 00540-59-0 | M                               | Yes              | No               | 95%        | 0.73                 | 0.02   | 3.81E-03  | 1.09E-04 |
| Benzene                                    | 00071-43-2 | H                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 1.39E-05  | 3.47E-07 |
| Carbon Tetrachloride                       | 00056-23-5 | H                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 1.39E-05  | 3.47E-07 |
| Chlorobenzene (Monochlorobenzene)          | 00108-90-7 | M                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 3.47E-06  | 3.47E-07 |
| Chloroform                                 | 00067-66-3 | M                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 6.94E-06  | 2.77E-06 |
| Methyl Tert Butyl Ether                    | 01634-04-4 | M                               | Yes              | Yes              | 95%        | 0.00                 | 0.00   | 6.94E-06  | 3.47E-07 |
| Tetrachloroethylene                        | 00127-18-4 | M                               | Yes              | Yes              | 95%        | 0.59                 | 0.02   | 3.12E-03  | 1.17E-04 |
| Toluene                                    | 00108-88-3 | L                               | Yes              | Yes              | 95%        | 0.01                 | 0.00   | 5.20E-05  | 2.43E-06 |
| Trichloroethylene                          | 00079-01-6 | M                               | Yes              | Yes              | 95%        | 2.24                 | 0.27   | 1.18E-02  | 1.43E-03 |
| Vinyl chloride                             | 00075-01-4 | H                               | Yes              | Yes              | 95%        | 0.20                 | 0.00   | 1.04E-03  | 1.66E-05 |
| Xylenes                                    | 01330-20-7 | M                               | Yes              | Yes              | 95%        | 0.01                 | 0.00   | 5.55E-05  | 6.94E-07 |
| Total VOCs                                 |            |                                 |                  |                  |            | 3.80                 | 0.32   |           |          |
| Total HAPs                                 |            |                                 |                  |                  |            | 3.08                 | 0.30   |           |          |
|  |            |                                 |                  |                  |            | Total Controlled VOC |        | 117 lb/yr |          |
|  |            |                                 |                  |                  |            | Total Controlled HAP |        | 110 lb/yr |          |

1. Source: "GM-38 Groundwater Remedy Analysis Report", February 2003
2. Source: DAR-1 AGC/SGC Tables, NYSDEC Division of Air Resources, Air Tox
3. Source: 6 NYCRR Part 200.1(cg)
4. Source: 6 NYCRR Part 200.1(ag)

**ATTACHMENT C**  
**2011 DISCHARGE GOALS AND 2011 DAR-1 ANALYSIS**

| Tetra Tech NUS   |          | STANDARD CALCULATION SHEET |                   |
|--|----------|----------------------------|-------------------|
| CLIENT:<br>US CLEAN  | FILE No: | BY:<br>SK                  | PAGE:<br>1 of 1   |
| SUBJECT: Calculation of Current Discharge Goals GM-38<br>Area NWIRP Bethpage, New York |          | CHECKED BY:                | DATE:<br>9/7/2011 |

**1. Purpose:**

To calculate current discharge goals for Trichloroethene (TCE), Tetrachloroethene (PCE), Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total), for treatment of off-gas from the air stripper stack AS-1.

**2. Approach:**

From the Contaminant Assessment Summary of the DAR-1 Model output for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total) (see DAR-1 output for analysis inputs), use the Actual Annual % of the Annual Guideline Concentration (AGC), a current average flow rate of 9,200 cubic feet per minute (cfm), and influent chemical emission rates in pounds per hour (lb/hour) and pounds per year (lb/year) to back calculate current discharge goals.

**3. Calculation of Current Discharge Goals:**

| Chemical                   | Current Actual Annual % of AGC <sup>(1)</sup> | Current Maximum Concentration (µg/m <sup>3</sup> ) <sup>(2)</sup> | Current Chemical Emission Rate Prior to Treatment (lb/hour) <sup>(3)</sup> | Current Chemical Emission Rate Prior to Treatment (lb/year) <sup>(3)</sup> | Calculated Discharge Goal (lb/hr) <sup>(4)</sup> | Calculated Discharge Goal (lb/year) <sup>(4)</sup> | Maximum Allowable Concentration (µg/m <sup>3</sup> ) <sup>(4)</sup> |
|----------------------------|---|---|--|--|--|--|---|
| TCE                        | 390.6   | 10,000  | 0.3446   | 3,019  | 0.0882   | 770  | 2,600   |
| PCE                        | 132.8   | 6,800   | 0.2344   | 2,053  | 0.1764   | 1,500  | 5,100   |
| Vinyl Chloride             | 13.49   | 76  | 0.0026   | 22.94  | 0.0194   | 170  | 560   |
| cis 1,2-Dichloroethene     | 0.2322  | 750   | 0.0258   | 226.4  | 11.13  | 98,000   | 320,000   |
| 1,2-Dichloroethene (total) | 0.2322  | 750   | 0.0258   | 226.4  | 11.13  | 98,000   | 320,000   |

**Notes:**

<sup>(1)</sup>Actual Annual % of the AGCs is from the attached DAR-1 Model Output.

<sup>(2)</sup>Values were taken from the Quarterly Operations Report First Quarter 2011 (June 2011) from ECOR Federal Services. Values were the maximum effluent concentration in off gas from air stripper stack AS-1 for the months of January, February, and March 2011.

<sup>(3)</sup>Chemical Emission Rates were calculated from maximum concentrations and an average flow rate of 9,200 cfm.

<sup>(4)</sup>Discharge Goals are based on a flow of 9,200 cfm, and calculated from the Actual Annual % of the AGCs from the DAR-1 Model Output to achieve air quality requirements. The summary of additional inputs for this model run is provided in the DAR-1 Model Output. Stack height is 40 feet, and the property line was evaluated at a distance of 50 feet.

BETHPAGE SITE GM-38 OFF-SITE GROUNDWATER AIR STRIPPER STACK EMISSIONS  
 DAR-1 MODEL OUTPUT, POINT SOURCE (STACK EMISSIONS) TYPE  
 INCLUDES ISCLT MODELING SUMMARY

- I. Summary of Inputs for Model Run to Nearest Property Line (50 feet), worst case scenario (highest contaminant concentrations seen in first quarter 2011 in untreated effluent from Air Stripper AS-1 prior to treatment with granular activated carbon (GAC))

| Chemical   | CAS No.<br>00079-01-6<br>(TCE) | CAS No.<br>00127-18-4<br>(PCE) | CAS No.<br>00075-01-4<br>(Vinyl<br>Chloride) | CAS No.<br>00156-59-2<br>(cis 1,2-<br>Dichloroethene) | CAS No.<br>00540-59-0<br>(1,2-<br>Dichloroethene,<br>total) |
|--|--------------------------------|--------------------------------|--|---|---|
| Emission Rate Prior to Treatment <sup>(1)</sup> (lb/hour)                              | 0.3444                         | 0.2342                         | 0.0026                                       | 0.0258  | 0.0258  |
| Emission Rate Prior to Treatment <sup>(1)</sup> (lb/year)                              | 3,017                          | 2,052                          | 22.93  | 226.0   | 226.0   |
| Maximum Concentration of Untreated Off Gas ( $\mu\text{g}/\text{m}^3$ ) <sup>(1)</sup> | 10,000                         | 6,800                          | 76   | 750   | 750   |
| Annual Guideline Concentration (AGC) ( $\mu\text{g}/\text{m}^3$ )                      | 0.5                            | 1.0                            | 0.11   | 63  | 63  |
| Short-term Guideline Concentration (SGC) ( $\mu\text{g}/\text{m}^3$ )                  | 14,000                         | 1,000                          | 180,000                                      | --  | --  |

|                  |  |                              |
|------------------|--|------------------------------|
| HA               | Height Above stack/ maximum height of plume (HA, feet)   | 15                           |
| SH               | Stack Height/Treatment Building Air Stack (SH, feet)   | 40                           |
| D                | Stack Diameter (D, inches)   | 36                           |
| T                | Stack Exit Temperature (T, degrees Fahrenheit)   | 80                           |
| V                | Stack Exit Velocity (V, ft/sec)  | 21.69                        |
| Q <sup>(2)</sup> | Stack Exit Flow Rate [Q, Actual Cubic Feet per Minute (ACFM)]  | 9,200                        |
| Dpl              | Shortest Distance from Source Building (Treatment Building) to Property Line (Dpl, feet) for point sources | 50                           |
| BW               | Building Width (BW, feet) of Source Building (Treatment Building) for point sources                        | 75                           |
| BL               | Building Length (BL, feet) of Source Building (Treatment Building)   | 75                           |
| Q                | Actual Hourly Emission Rate (lbs/hour) for source contaminant  | Chemical specific, see above |
| Qa               | Actual Annual Emission Rate (lbs/year) for source contaminant  | Chemical specific, see above |

<sup>(1)</sup> Emission rates and maximum concentration values were taken from the Quarterly Operations Report First Quarter (June 2011) as provided by ECOR Services, using January, February, and March 2011 maximum rates of untreated off gas from Air Stripper AS-1 in the

GM-38 Treatment Building. Emission rates are based on continuous operation 24 hours per day, 7 days a week, 52 weeks a year, or approximately 8,760 hours of operation.

<sup>(2)</sup> "Q" is an average value of January and February 2011 monthly flow rates. Effective water and vapor flow rates were reduced during the reporting period of March due to a shutdown of the Treatment Plant on March 23, 2011.

II. Contaminant Assessment Summary of TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

| CONTAMINANT ASSESSMENT SUMMARY OF DAR-1 ANALYSIS |              |  |                              |                                 |                              | 9/ 8/11 |
|--|--------------|--|------------------------------|---------------------------------|------------------------------|---------|
|  |              |  |                              |                                 |                              | Page 1  |
| CAS NUMBER                                       | AGC<br>ug/m3 | SHORT-TERM                             | CAVITY                       | POINT or AREA SOURCE            |                              |         |
|  |              | MAXIMUM<br>(Cav. Pt. Area)<br>% OF SGC | ACTUAL<br>ANNUAL<br>% OF AGC | POTENTIAL<br>ANNUAL<br>% OF AGC | ACTUAL<br>ANNUAL<br>% OF AGC |         |
| 00075-01-4                                       | 0.11000000   | 0.0005                                 | 0.0000                       | 13.3889                         | 13.4948                      |         |
| 00079-01-6                                       | 0.50000000   | 0.7757                                 | 0.0000                       | 390.1734                        | 390.6266                     |         |
| 00127-18-4                                       | 1.00000000   | 7.3852                                 | 0.0000                       | 132.6635                        | 132.8415                     |         |
| 00156-59-2                                       | 63.00000000  | 0.0000                                 | 0.0000                       | 0.2320                          | 0.2322                       |         |
| 00540-59-0                                       | 63.00000000  | 0.0000                                 | 0.0000                       | 0.2320                          | 0.2322                       |         |
| SUMMARY TOTALS                                   |              | 8.1614                                 | 0.0000                       | 536.6897                        | 537.4274                     |         |

III. Contaminant Impact Summary of TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

| CONTAMINANT IMPACT SUMMARY OF DAR-1 ANALYSIS |              |                                     |                           |                              |                           | 9/ 8/11 |
|--|--------------|-------------------------------------|---------------------------|------------------------------|---------------------------|---------|
|  |              |                                     |                           |                              |                           | Page 1  |
| CAS NUMBER                                   | AGC<br>ug/m3 | SHORT-TERM                          | CAVITY                    | POINT or AREA SOURCE         |                           |         |
|  |              | MAXIMUM<br>(Cav. Pt. Area)<br>ug/m3 | ACTUAL<br>ANNUAL<br>ug/m3 | POTENTIAL<br>ANNUAL<br>ug/m3 | ACTUAL<br>ANNUAL<br>ug/m3 |         |
| 00075-01-4                                   | 0.11000000   | 0.81988204                          | 0.00000000                | 0.01472780                   | 0.01484433                |         |
| 00079-01-6                                   | 0.50000000   | 108.60282900                        | 0.00000000                | 1.95086694                   | 1.95313296                |         |
| 00127-18-4                                   | 1.00000000   | 73.85244750                         | 0.00000000                | 1.32663476                   | 1.32841504                |         |
| 00156-59-2                                   | 63.00000000  | 8.13575172                          | 0.00000000                | 0.14614509                   | 0.14630693                |         |
| 00540-59-0                                   | 63.00000000  | 8.13575172                          | 0.00000000                | 0.14614509                   | 0.14630693                |         |



IV. Contaminant Impact Summary Step by Step Menu for TCE:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00079-01-6          SIC = 0
AGC =          0.5000000000 ug/m3          SGC =          14000.0000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., T=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.3444000000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          3017.0000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 0.500 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 2.604 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 2.601 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```

III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 1.953 ug/m3 > is greater than AGC < 0.500 ug/m3 >.

\*\*\*\* Refer to DAR-1 Section III.D.1. A refined site \*\*\*\*  
 \*\*\*\* specific modeling analysis may be required. \*\*\*\*

III.D. STANDARD POINT SOURCE Potential Annual Impact < 1.951 ug/m3 > is greater than AGC < 0.500 ug/m3 >.

\*\*\*\* Potential Annual Impact is based upon 8760 hours/year \*\*\*\*  
 \*\*\*\* operation instead of reported 8760. hours/year. \*\*\*\*

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.  
 See "Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region:  $h_s < 40. \text{ feet} > > h_c < 26. \text{ feet} >$ .

II.C. CAVITY Short-Term Impact < 0.000 ug/m3 > is less than SGC < 14000.000 ug/m3 >.

2.3 Momentum flux,  $F_m$ , is equal to 1000.331 ft(4)/sec(2).

2.3 Effective stack height,  $h_e$ , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (GSTP) is equal to 38.826 ug/m3, for  $h_s/h_b = 1.60$

2.5 Maximum downwash Short-Term Impact (GSTD) is equal to 129.908 ug/m3, for:  $h_s/h_b = 1.60$  and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (GSTD) is equal to 108.603 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST: 108.603 ug/m3 > is less than the SGC < 14000.000 ug/m3 > for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 108.603 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC < 14000.000 ug/m3 >.



V. Contaminant Impact Summary Step by Step Menu for PCE:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, MEV
EMISSION POINT =          TOTAL          CAS NUMBER = 00127-18-4          SIC = 0
AGC =          1.000000000 ug/m3          SGC =          1000.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., T=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate (Q) is equal to          0.234200000 lbs/hour.
** Reported Annual Emission Rate (Qa) is equal to          2052.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD (DAR-1, APPENDIX B).
II.B.1. Shortest Distance from building to Property Line ( 50. feet )
is less than or equal to the cavity length, or 3 building
heights ( 75. feet ). Therefore, this building will have
cavity impacts (if they occur) at receptors off plant property.
II.B.2. The largest building dimension ( 75. feet ) is greater than or
equal to the building height ( 25. feet ). Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height ( 40. feet ) is greater than cavity height
( 38. feet ). Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact ( 0.000 ug/m3 ) is less than AGC
( 1.000 ug/m3 ).
III.A. STANDARD POINT SOURCE METHOD (DAR-1, APPENDIX B).
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 1.771 ug/m3 for 8762. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 1.769 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```



III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact ( 1.328 ug/m3 ) is greater than AGC ( 1.000 ug/m3 ).

\*\*\*\* Refer to DAR-1 Section III.D.1. A refined site \*\*\*\*  
\*\*\*\* specific modeling analysis may be required. \*\*\*\*

III.D. STANDARD POINT SOURCE Potential Annual Impact ( 1.327 ug/m3 ) is greater than AGC ( 1.000 ug/m3 ).

\*\*\*\* Potential Annual Impact is based upon 8760 hours/year \*\*\*\*  
\*\*\*\* operation instead of reported 8762. hours/year. \*\*\*\*

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.  
See "Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.000 ug/m3 as the plume escaped the cavity region: hc( 40. feet ) > hc( 26. feet ).

II.C. CAVITY Short-Term Impact ( 0.000 ug/m3 ) is less than SGC ( 1000.000 ug/m3 ).

2.3 Momentum Flux,  $F_m$ , is equal to 1000.331 ft<sup>4</sup>/sec<sup>2</sup>.

2.3 Effective stack height,  $h_e$ , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 26.403 ug/m3, for  $h_c/h_b = 1.60$

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 88.340 ug/m3, for:  $h_c/h_b = 1.60$  and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 73.852 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST: 73.852 ug/m3 ) is less than the SGC ( 1000.000 ug/m3 ) for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 73.852 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC ( 1000.000 ug/m3 ).

VI. Contaminant Impact Summary Step by Step Menu for Vinyl Chloride:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00075-01-4          SIC = 0
AGC =          0.110000000 ug/m3          SGC =          180000.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., I=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.002600000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          22.930000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 0.110 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.020 ug/m3 for 8819. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.020 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```



III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.015 ug/m3 > is less than AGC < 0.110 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.015 ug/m3 > is less than AGC < 0.110 ug/m3 >.

\*\*\*\* Potential Annual Impact is based upon 8760 hours/year \*\*\*\*  
 \*\*\*\* operation instead of reported 8819. hours/year. \*\*\*\*

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.  
 See "Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region: hs< 40. feet > hc< 26. feet >.

II.C. CAVITY Short-Term Impact < 0.000 ug/m3 > is less than SGC < 180000.000 ug/m3 >.

2.3 Momentum flux,  $F_m$ , is equal to 1000.331 ft<4>/sec<2>.

2.3 Effective stack height,  $h_e$ , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 0.293 ug/m3, for  $h_s/h_b = 1.60$

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 0.981 ug/m3, for:  $h_s/h_b = 1.60$  and  $ESH = 51. feet.$

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 0.820 ug/m3, for:  $RF = 0.84$

III.D. Maximum non-cavity Short-Term Impact (CST: 0.820 ug/m3 > is less than the SGC < 180000.000 ug/m3 > for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 0.820 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC < 180000.000 ug/m3 >.

VII. Contaminant Impact Summary Step by Step Menu for cis 1,2-Dichloroethene:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00156-59-2          SIC = 0
AGC =          63.000000000 ug/m3          SGC =          0.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., I=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.025800000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          226.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 63.000 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.195 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.195 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```



III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.146 ug/m3 > is less than AGC < 63.000 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.146 ug/m3 > is less than AGC < 63.000 ug/m3 >.

\*\*\*\* Potential Annual Impact is based upon 8760 hours/year \*\*\*\*  
 \*\*\*\* operation instead of reported 8760. hours/year. \*\*\*\*

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.  
 See 'Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian,' 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region: hs( 40. feet) > hc( 26. feet).

II.C. CAVITY Short-Term Impact is equal to 0.000 ug/m3.  
 There is no SGC for this contaminant.

2.3 Momentum flux, Fm, is equal to 1000.331 ft(4)/sec(2).

2.3 Effective stack height, he, is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 2.909 ug/m3, for hs/hb = 1.60

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 9.732 ug/m3, for: hs/hb = 1.60 and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 8.136 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST) equals 8.136 ug/m3 for the point source. There is no SGC for this contaminant.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 8.136 ug/m3 and is reported in the ANALYSIS MENU.

VIII. Contaminant Impact Summary Step by Step Menu for 1,2-Dichloroethene (total):

```
*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00540-59-0          SIC = 0
AGC =          63.000000000 ug/m3          SGC =          0.000000 ug/m3
STACK: HA= 15., SH= 40., D= 36., T= 80., U= 21.69, q= 9200.00
BUILDING: Dpl= 50., BW= 75., BL= 75., %CONTROL= 0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.025800000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          226.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 63.000 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Pm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.195 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.195 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.
```



```

III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below
         using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.146 ug/m3 > is
         less than AGC < 63.000 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.146 ug/m3 >
         is less than AGC < 63.000 ug/m3 >.

**** Potential Annual Impact is based upon 8760 hours/year ****
**** operation instead of reported 8760. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.
    See "Technical Reference for the Screening Procedures of the
    DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume
     escaped the cavity region: hs< 40. feet > hc< 26. feet >.

II.C. CAVITY Short-Term Impact is equal to 0.000 ug/m3.
       There is no SGC for this contaminant.

2.3 Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.

2.3 Effective stack height, he, is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact <CSTP> is equal
     to 2.909 ug/m3, for hs/hb = 1.60

2.5 Maximum downwash Short-Term Impact <CSTD> is equal
     to 9.732 ug/m3, for: hs/hb = 1.60 and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term <CSTD> is equal
     to 8.136 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact <CST> equals 8.136 ug/m3
       for the point source. There is no SGC for this contaminant.

2.7 Maximum Short-Term cavity, point, or area source impact
     <SHORT-TERM MAXIMUM, <Cav.Pt.Area>> equals 8.136 ug/m3
     and is reported in the ANALYSIS MENU.

```

IX. AGCs and SGCs for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

| AGCs & SGCs |                       |              |              | 9/ 8/11      |                          |
|-------------|-----------------------|--------------|--------------|--------------|--------------------------|
|             |                       |              |              | Page 1       |                          |
| CAS NUMBER  | CONTAMINANT NAME      | SGC<br>ug/m3 | II<br>O<br>V | AGC<br>ug/m3 | II I<br>O O<br>V X CODES |
| 00075-01-4  | VINYL CHLORIDE        | 18000.00000  | D            | 0.110000000  | E H U HA                 |
| 00079-01-6  | TRICHLOROETHYLENE     | 14000.00000  | Z            | 0.500000000  | D M O HO                 |
| 00127-10-4  | TETRACHLOROETHYLENE   | 1000.00000   | H            | 1.000000000  | H M O HI                 |
| 00156-59-2  | DICHLOROETHYLENE, cis | 0.00000      |              | 63.000000000 | D M                      |
| 00540-59-0  | DICHLOROETHYLENE, 12  | 0.00000      |              | 63.000000000 | D M                      |

X. Contaminant Emissions Summary for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

| CONTAMINANT EMISSIONS SUMMARY |                       |                         |                      | 9/ 8/11              |  |
|-------------------------------|-----------------------|-------------------------|----------------------|----------------------|--|
|                               |                       |                         |                      | Page 1               |  |
| CAS NUMBER                    | CONTAMINANT NAME      | NUM. OF EPs PER CONTAM. | EMISSIONS (lbs/hour) | EMISSIONS (lbs/year) |  |
| 00075-01-4                    | VINYL CHLORIDE        | 1                       | 0.0026000            | 22.93000             |  |
| 00079-01-6                    | TRICHLOROETHYLENE     | 1                       | 0.3444000            | 3017.00000           |  |
| 00127-10-4                    | TETRACHLOROETHYLENE   | 1                       | 0.2342000            | 2052.00000           |  |
| 00156-59-2                    | DICHLOROETHYLENE, cis | 1                       | 0.0258000            | 226.00000            |  |
| 00540-59-0                    | DICHLOROETHYLENE, 1,2 | 1                       | 0.0258000            | 226.00000            |  |
| SUMMARY TOTALS                |                       | 5                       | 0.6328000            | 5543.93000           |  |

XI. Meter Grid Modeling Results for Maximum Annual Concentrations of TCE, within 25 meters:

| CONCENTRATIONS x 10 <sup>-2</sup> (ug/m3) for 00079-01-6 |         |         |         |         |         |         |         |         |         |         |         |         |         | 09/08/11 |  |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|--|
| AGC =  |         |         |         |         |         |         |         |         |         |         |         |         |         | 13:17:58 |  |
| TIME   | 367000. | 368000. | 369000. | 370000. | 371000. | 372000. | 373000. | 374000. | 375000. | 376000. | 377000. | 378000. | 379000. |          |  |
| 4511000.   | 0.04    | 0.06    | 0.08    | 0.14    | 0.23    | 0.32    | 0.41    | 0.30    | 0.14    | 0.10    | 0.08    | 0.06    | 0.05    |          |  |
| 4510000.   | 0.03    | 0.05    | 0.08    | 0.13    | 0.25    | 0.43    | 0.60    | 0.40    | 0.17    | 0.12    | 0.09    | 0.07    | 0.06    |          |  |
| 4509000.   | 0.02    | 0.03    | 0.06    | 0.11    | 0.24    | 0.58    | 1.01    | 0.52    | 0.22    | 0.14    | 0.11    | 0.08    | 0.06    |          |  |
| 4508000.   | 0.02    | 0.03    | 0.04    | 0.06    | 0.18    | 0.62    | 2.16    | 0.64    | 0.31    | 0.19    | 0.13    | 0.11    | 0.09    |          |  |
| 4507000.   | 0.02    | 0.03    | 0.04    | 0.06    | 0.11    | 0.26    | 7.27    | 1.43    | 0.60    | 0.34    | 0.22    | 0.15    | 0.12    |          |  |
| 4506000.   | 0.03    | 0.03    | 0.05    | 0.07    | 0.13    | 0.33    | 2.58    | 2.99    | 1.12    | 0.51    | 0.30    | 0.20    | 0.14    |          |  |
| 4505000.   | 0.03    | 0.04    | 0.05    | 0.08    | 0.20    | 0.45    | 0.94    | 0.81    | 0.60    | 0.45    | 0.33    | 0.23    | 0.16    |          |  |
| 4504000.   | 0.03    | 0.04    | 0.07    | 0.12    | 0.20    | 0.22    | 0.47    | 0.43    | 0.33    | 0.27    | 0.24    | 0.20    | 0.16    |          |  |

| TOP 100 CONTRIBUTORS TO MAXIMUM CONCENTRATION FOR 00079-01-6 |                           |        |                     |             |                 |  | 09/08/11 |  |
|--|---------------------------|--------|---------------------|-------------|-----------------|--|----------|--|
| @ UTMN: 373000.  |                           |        |                     |             |                 |  | 13:17:58 |  |
| Emission Point   | Facility Name (shortened) | EP DIR | Distance to Max.(m) | CONC. ug/m3 | Percent of Max. |  |          |  |
| TOTAL  | NWIRP BETHPAGE GM-38 AREA | SSE    | 539.                | 0.727E-01   | 100.000         |  |          |  |
| TOTAL OF ALL   | 1 CONTRIBUTORS            |        |                     | 0.727E-01   | 100.000         |  |          |  |



XII. ISCLT Model Run Information, within 25 meters:

```

                                MODEL RUN INFORMATION
                                09/08/11
                                13:17:58

1. Current GRID SPACING equals 1000. meters.
2. Maximum Concentration (flashing) equals 0.0727115273 ug/m3
   @ UTME: 373000. UTMN: 4507000.

3. RUN FILE: TEMP?.RUN
4. METEOROLOGICAL FILE: ALB.MET
5. RUN MODE: URBAN
6. HALF-LIVES: not used to account for pollutant removal from air.
7. BLD. WAKE EFFECTS: AS-1 METHOD, All data KNOWN (hb, hv, hl, orientation)
8. EMISSIONS: ACTUAL ANNUAL EMISSIONS
9. SOURCES: All sources within 25. meters of
   UTME: 373275. UTMN: 4506537.
10. CONTAMINANT CAS NUMBER(s): 00079-01-6
11. EMISSION POINT - CONTAMINANT(s) found by computer: 1
12. No data is being copied to DUMP file.
```

## **APPENDIX C**

### **FIELD LOGS**

Date: 5.30.2019



### Groundwater Level Measurement Sheet

Project Site: NWIRP Bethpage – GM-38  
 Location: Bethpage, NY  
 Field Crew: RH

Water Level Meter: Solinst  
 Weather: cloudy, 57°F, 29.9" Hg 5mph E-SE  
 Time of Low Tide: N/A  
 Time of High Tide: N/A

| Well ID | Time  | Depth to Water (ft.) | Total Depth of Well / Screenshot Interval (ft.) | PID (ppm) | Comments |
|---------|-------|----------------------|---|-----------|----------|
| RW1-MW1 | 11:20 | 38.42                | 435 / 395-435                                   | ---       |          |
| RW1-MW2 | 11:10 | 41.71                | 435 / 395-435                                   | ---       |          |
| RW1-MW3 | 11:30 | 38.42                | 435 / 395-435                                   | ---       |          |
| RW2-MW1 | 11:40 | 44.04                | 510 / 470-510                                   | ---       |          |
| RW2-MW2 | 11:45 | 42.47                | 510 / 470-510                                   | ---       |          |
| RW2-MW3 | 11:50 | 42.55                | 510 / 470-510                                   | ---       |          |
| RW3-MW1 | 12:10 | 40.19                | 350 / 330-350                                   | ---       |          |
| RW3-MW2 | 12:20 | 43.11                | 495 / 475-495                                   | ---       |          |
| RW3-MW3 | 11:55 | 42.41                | 340 / 320-340                                   | ---       |          |
| RW3-MW4 | 12:00 | 44.17                | 495 / 475-495                                   | ---       |          |
| TP1     | 11:00 | 40.13                | 470 / 450-470                                   | ---       |          |
| IW1-MW1 | 11:25 | 37.48                | 470 / 450-470                                   | ---       |          |
| RW-1    | 11:05 | ok                   | Open vault and check integrity of piping, etc.  |           |          |
| RW-3    | 12:20 | ok                   | Open vault and check integrity of piping, etc.  |           |          |
|         |       |                      |   |           |          |
|         |       |                      |   |           |          |
|         |       |                      |   |           |          |
|         |       |                      |   |           |          |

Signature: \_\_\_\_\_

Date: 5.30.2019