ECM

environmental compliance monitoring, inc.

OPERABLE UNIT 1
MW - 31 WORKPLAN

FORMER KAY FRIES SITE
STONY POINT, NEW YORK
SITE NO. 344023
ECM PROJECT NO. 1192

PREPARED FOR:
EVONIK DEGUSSA CORPORATION
299 JEFFERSON ROAD
PARSIPPANY, NEW JERSEY

MARCH 2012

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1.0 INTRODUCTION

This *Operable Unit 1 (OU1) MW-31 Workplan (WP)* has been prepared by Environmental Compliance Monitoring, Inc. (ECM) on behalf of Evonik Degussa Corporation (Evonik), presenting the proposed in-situ remediation at the Former Kay Fries, Inc. site, located in Stony Point, New York (herein referred to as the "site" or the “subject site”). This workplan presents the details of the subsurface application of a chemical oxidant (RegenOx®) combined with Advanced Formula Oxygen Release Compounds (ORC Advanced®) to enhance ground water remediation in the area proximal to MW-31. The WP has been prepared in response to the New York State Department of Environmental Conservation (NYSDEC) letter dated March 25, 2010, and in accordance with Division of Environmental Remediation (DER) – 10 *Technical Guidance for Site Investigation and Remediation* Section 5.3. Additionally, subsequent to the on-site meeting between NYSDEC, the New York State Department of Health (NYSDOH), Evonik, and ECM on January 27, 2012 the NYSDEC requested that monitoring well MW-24 be considered for inclusion in the in-situ WP as a result of the VOCs (benzene, chlorobenzene, cis-1,2-dichloroethane, trans-1,2-dichloroethene, trichloroethene [TCE], and vinyl chloride) reported in MW-24 above the NYSDEC Ground Water Quality Criteria (GWQC) during the August 2011 sampling event (as reported in the Periodic Review Report for the period January 2011 through December 2011). Further assessment and recommendations relative to the compounds of concern in MW-24 are presented within this WP.

1.1 BACKGROUND

The OU1 Ground Water Treatment System (GWTS) has effectively processed ground water from the three on-site Recovery Trenches 1, 2, and 3 and has been compliant with the NYSDEC effluent discharge criteria from inception of operation during 1995 through 2010. During March 2006, cessation and closure of Trench 3 was approved by the NYSDEC as a result of decreased volatile organic compounds (VOCs) reported during the long term groundwater monitoring program.

To assess ground water quality upgradient and downgradient of Recovery Trenches 1, 2, and 3, ground water monitoring is conducted via the long-term ground water monitoring program that was approved by the NYSDEC during 1997. From 1997 through the present, the long-term ground water monitoring program has included the sampling and analysis of nine monitoring wells

(TB-9, TB-23, MW-28, MW-31, MW-35, MW-41, MW-43, MW-49 and MW-61). The samples have been historically analyzed for NYSDEC Target Compound List volatile organic compounds plus 15 library search compounds (VOC+15) including a search for methyl isobutyl ketone (MIBK) and 1,4-dioxane, During 2002, sampling from MW-35 and MW-49 was discontinued since VOC+15 including MIBK and 1,4 dioxane were consistently not detected in these two wells. Monitoring well MW-41 sampling was discontinued during 2007 due to abandonment of this well as part of the Trench 3 closure.

Elevated VOCs within OU1 have been primarily limited to one area upgradient of Trench 2 (proximal to monitoring well MW-31). During October 2002, a distribution assessment was conducted of the compounds historically reported in monitoring well MW-31. The findings of the assessment were reported to the NYSDEC in the ECM letter dated February 13, 2003. The highest concentration of target VOC compounds detected during the assessment were chloroethane (900 μg/L), dichloroethane (210 μg/L), toluene (46 μg/L), benzene (920 μg/L) and chlorobenzene (630 μg/L). A copy of the February 13, 2003 distribution assessment is included as Appendix 1.

Based upon the results of the distribution assessment and the MW-31 monitoring data from inception of the GWTS operation, enhanced remediation through the application of a chemical oxidant (RegenOx®) in the area of MW-31 was previously proposed and conceptually approved by the NYSDEC in their letter dated August 28, 2006. Recently, the in-situ design was re-evaluated by ECM and REGENISIS (in-situ treatment engineer) due to the lower levels reported in MW-31, technological advancements in the field of in-situ remediation, and the potential for OU1 site development, which would limit the in-situ application to possibly one event. Based on the evaluation, the in-situ treatment design was modified to the application of RegenOx® combined with ORC Advanced®.

During July 2008, a pilot study using RegenOx® was conducted on-site. The pilot study had a twofold objective, to assess absorption of the slurry into the subsurface and assess the injection rate of the slurry to define the duration of the field application based on the absorption. The results of the July 2008 pilot study are presented below.

1.2 JULY 30, 2008 PILOT STUDY

The pilot study was conducted to assess the optimum rate of injection and absorption of the RegenOx® slurry into subsurface and from these variables, outline the field effort for the full scale application. The Pilot Study was not intended to assess the remedial effectiveness of the technology at the site.

At the time of the pilot study, during July 2008, it was initially proposed to use the chemical oxidant RegenOx® as the treatment method. Therefore, the RegenOx® reagent was utilized for the pilot study at the site. The use of the RegenOx®, would aid in mimicking the application of the product into the subsurface during the full scale application. RegenOx® was available to apply as a five percent RegenOx® slurry at five injection points upgradient of MW-31. The REGENESIS design dosage rate was 60 pounds RegenOx® reagent/activator per injection point or approximately 70 gallons/point (oxidant/activator/water mixture). The location of the pilot study injection points upgradient of MW-31, are depicted on Figure 1.

The RegenOx® was combined with water and activator and the slurry was injected into the subsurface to a targeted depth ranging from approximately two to nine feet below grade surface (BGS) via direct-push drilling techniques. The targeted injection interval was based on the screen interval of MW-31, which was installed from two feet to seven feet BGS. Drive rods were pushed into the saturated zone and the RegenOx®/water slurry was methodically injected as the rods were withdrawn.

An approximate average of 8.5 gallons of RegenOx® solution was applied per vertical foot over the target injection interval, which varied at each location based upon the local topography and/or acceptance of the slurry into the subsurface. To reiterate, the objective of the pilot study was to evaluate the acceptance of the slurry into the formation and the rate at which it could be injected due to the tight clay layer beneath the site. If the slurry was not absorbed into the subsurface and/or observed to migrate to the ground surface, than the application method would have to be re-evaluated. The RegenOx® pilot study field observations are summarized on the table below.

BORING ID	TREATMENT INTERVAL (FT/BGS)	REGENOX® VOLUME (GALLONS)	OBSERVATIONS
Point 1	8-10	34	Surfacing of reagent observed. Rate of injection was started 10 gpm and decreased to 1 gpm. Terminated injection.
Point 2	2-14	106	70-gal for Point 2 plus the balance from Point 1 and; no surfacing observed.
Point 3	2-14	70	No surfacing observed.
Point 4	2-9	70	No surfacing observed.
Point 5	2-9	70	No surfacing observed.

Review of the pilot study results indicated that four of the five borings accepted delivery of the RegenOx® at a rate of four gallons per minute (gpm) into the subsurface with the exception of Point 1. Point 1 was located on the facility access road and surfacing of the RegenOx® slurry was observed attempting to apply the slurry from 10 feet up to eight feet below grade. As a result of the slurry surfacing the injection at Point 1 was terminated. As a result of the surfacing at Point 1, the treatment interval depth for Points 2 and 3 were increased from nine feet to 14 feet BGS at the advice of the REGENESIS engineer. The treatment interval was intentionally increased to assess if the slurry would be absorbed into the subsurface at depth and over a greater interval, without any observed surfacing of the slurry. Since the slurry was successfully injected, with no observed surfacing from 14 to two feet BGS at Points 2 and 3, the interval was reduced back to the design interval of nine to two feet BGS for Points 4 and 5. The slurry was also successfully delivered into the subsurface at these two locations. Overall, approximately 320 gallons were injected into the subsurface (Points 2 through 5), which equates to approximately 8.5 gallons/foot, proximal to the design dosage of 10 gallons/foot for the targeted treatment interval.

Based on the results, the RegenOx® slurry design dosage was delivered into the subsurface at four of the 5 points at a rate of four gpm. From the pilot study results, it is expected that the full scale application of RegenOx® will be successful.

Semi-annual ground water monitoring was conducted subsequent to the pilot study during April and December 2009, June and November 2010, and April and August 2011. A summary of the MW-31 historic ground water results, inclusive of the most recent analytical data is summarized on Table 1.

Based on a review of the analytical results, an initial increase/rebound in target compound concentrations was observed during the April 2009 and December 2009 sampling event. Previous experience with the application of RegenOx® has documented that an initial rebound/upward spike in target compound concentrations may occur subsequent to the application of the reagent into the subsurface. Additionally, REGENESIS reported that a rebound in compound concentrations is common following the initial subsurface injections due to desorption (liberation) of soil-bound contamination. REGENESIS also indicated that over time, contaminant levels should stabilize and begin a downward trend.

A decrease in contaminant levels was reported in the June 2010 sampling event (Table 1); however, levels increased during November 2010 and remained level during the two 2011 events with the exception of the chloroethane concentration, which fluctuated over the period. It should be noted that the intent of the pilot study was to define the application rate and absorption of the RegenOx® into the subsurface. The Pilot Study was not intended to assess the remedial effectiveness of the technology at the site. A greater oxidation and decrease in contaminant levels is expected subsequent to the full-scale application. Also, in consideration of the design change to inject RegenOx® combined with the ORC Advanced®, an immediate mass reduction through oxidation is anticipated with continued degradation through bioremediation over time. As such, implementation of the full scale application is recommended as described below.

2.0 Full-Scale Application

The NYSDEC March 25, 2010 letter required the MW-31 WP be revised to include the results of the pilot study described above, installation of additional monitoring wells to assess the pre and post in-situ treatment ground water quality and the details of the in-situ treatment application. As previously stated, the in-situ design was enhanced by using chemical oxidation (RegenOx®) combined with the application of ORC Advanced® primarily as a result of lower levels reported in MW-31 and OU1 site development, which would limit the in-situ application to possibly one event. Based on the change in the in-situ design, the NYSDEC, Evonik and ECM agreed to discuss the details of the in-situ remediation program during the on-site meeting on January 27, 2012. The details of in-situ remedial design and the monitoring program are presented below.

2.1 BASELINE MONITORING

To assess the effectiveness of the in-situ remediation, additional delineation monitoring wells are proposed to be installed up-gradient and cross-gradient of MW-31, (north, south and west of the treatment area as depicted on Figure 2). Existing monitoring wells MW-36 and MW-37 provide delineation points in the downgradient eastern direction (Figure 2) and therefore, additional wells in this direction are currently unnecessary. During the January 27, 2012 site meeting, PZ-9 was inadvertently sighted as MW-36 (i.e., not the correct location). Subsequent to further review of site survey drawings, MW-36 was properly located as a flushmount well downgradient of MW-31 (Figure 2) but was not noted during the meeting. Therefore, MW-36 will be used as the delineation well in the downgradient eastern direction.

The proposed delineation monitoring wells, designated as MW-70, MW-71 and MW-72 will be installed via hollow stem auger drilling techniques as outlined below.

- The monitoring well borehole will be advanced to approximately five feet below the soil/ground water interface;
- Each well will be constructed with two-inch inner-diameter, 10-slot (0.010-inch) PVC well screen, which will extend from approximately three feet BGS to approximately five feet below observed ground water. The base of the wells will be capped;
- Each well screen will be flush-threaded to PVC casing, extended from three inches below grade to the top of the screen;

- A Morie #1 sand filter pack will installed within the annuli around the wells, from the base of the borehole to one to two feet BGS, a bentonite-containing cement grout will be placed around the PVC casing to the top of the sand pack;
- The wells will be completed with either flush-mount and/or stick-up casings, watertight caps and locks, and steel well caps protected by concrete collars; and,
- The three monitoring wells will be developed at a flow rate of approximately one-gallon per minute (gpm) until a turbid-free discharge is maintained. The wells will be allowed to equilibrate for approximately two weeks prior to the baseline monitoring event.

Baseline ground water samples will be collected from the three newly installed wells and MW-31, MW-36 and MW-37 to assess pre-application VOC concentrations. Additionally, as previously stated, during the site meeting, the NYSDEC requested that MW-24 be considered for inclusion in the in-situ remediation program and therefore will be included in the base-line monitoring plan.

The ground water samples will be analyzed for VOCs+15 and a search for MIBK and 1,4-dioxane, and indicator parameters (total iron, manganese, and oxidation redox potential [ORP]). The baseline monitoring results will be reviewed prior to the RegenOx® ORC Advanced® application and if necessary, the treatment grid will be adjusted accordingly to account for any shift in compound levels.

2.2 FULL-SCALE APPLICATION

The ground water results of the long term monitoring program and the data generated during the February 2003 distribution assessment (Appendix 1) were provided to REGENESIS to help formulate a full-scale combined RegenOx® ORC Advanced® application design. Appendix 2 presents the REGENESIS remedial design for application of RegenOx® and ORC Advanced® upgradient and proximal to MW-31.

Based on the data, the areas primarily north, south and west of MW-31 were targeted for the treatment area. Subsequent to the meeting on January 27, 2012, the northern extent of the treatment area required adjustment to avoid the former aboveground storage tank concrete foundation slab. The location of the slab (north of MW-31) would prohibit injection of reagent into the subsurface in that immediate area. Figure 2 depicts the revised proposed RegenOx® ORC Advanced® treatment area. The treatment area was extended to the west and north to affect the

area upgradient of MW-31. This area contained the highest distribution of contaminant levels surrounding and reported in MW-31.

The combined RegenOx® ORC Advanced® application is designed for the RegenOx® to chemically oxidize the elevated target compounds and provide a mass reduction of compound concentrations after delivery of the oxidant, which would continue for approximately four weeks. The ORC Advanced® will provide a controlled–release of oxygen to the groundwater to enhance aerobic biodegradation of the contaminants for a period of up to 12 months. The treatment will be accomplished by arranging a grid of injection points throughout the target area and utilizing direct push technologies to deliver the RegenOx® ORC Advanced® into the subsurface similar to the pilot study.

As stated above, MW-24 (Figure 2) will be considered for inclusion in the in-situ remedial program due to the compounds of concern reported in MW-24 (benzene, chlorobenzene, cis-1,2-dichloroethane, trans-1,2-dichloroethene, trichloroethene [TCE], and vinyl chloride) reported above the NYSDEC – GWQC. The compounds of concern reported in MW-24 were evaluated by REGENESIS for in-situ treatment. Since TCE was reported in MW-24, REGENESIS indicated that TCE will only degrade under anaerobic conditions, therefore, an anaerobic degradation product Hydrogen Release Compound (HRC) Primer would be required to treat the TCE followed by RegenOx® ORC Advanced®.

Based on the change in product (HRC Prime) to remediate TCE reported in MW-24, Evonik requests additional ground water sampling be conducted in MW-24 to assess and confirm the VOC levels over time. Additional review of historical analytical data (January 1990 and October 2002) reported TCE as not detected in MW-24. Since TCE was not previously reported in MW-24, it is proposed to sample MW-24 and PZ-23 downgradient of MW-24 (Figure 2) to delineate the extent of VOCs (if any) in the downgradient direction. Sampling would be conducted as part of the baseline monitoring and for one post-remedial quarterly sampling event as presented on the implementation schedule (Section 3.0). Subsequent to the two sampling events an evaluation and in-situ treatment strategy (if necessary) will be presented to the NYSDEC along with the findings and results of the MW-31 in-situ treatment activity.

Taking into account the information obtained during the pilot test, the distribution assessment and ground water monitoring data, the details of the remedial design for the application of RegenOx® ORC Advanced® are presented below.

REGENOX® ORC ADVANCED®– MW-31 AREA

Design estimates provided by REGENESIS propose application of up to 5,900 pounds of RegenOx® and 2,800 pounds of ORC Advanced® product into the subsurface in the target area around MW-31. The proposed application would consist of mixing the RegenOx® and ORC Advanced® with water and an activator and injecting the slurry from nine feet BGS at an anticipated flow rate of approximately four gpm upward to a depth of approximately two feet BGS via direct-push technologies. The design consists of the following:

Targeted Treatment Area (ft)	Rows in Grid	Injection Points per Row	Injection Points Spacing (ft)	Number of Injection Points	Treatment Zone (ft BGS)	RegenOx®– ORC Advanced® (lbs/ft)	RegenOx®– ORC Advanced® (gals./ft)	Total RegenOx®- ORC Advanced® (lbs)
100 x 120	12	10	10	120-130	2 to 9	9.5	9.0	8,700

Please note that the grid dimensions, injections points and total volume of product may vary pending actual site conditions. Additionally, the product application will be concentrated in the areas of known elevated compounds (i.e., reducing injection point spacing and/or adding points beyond the grid).

To maximize contact of the RegenOx® ORC Advanced® with the ground water contaminants, the application of the reagents will start with the injection points at the grid perimeter and work inward towards the center of the grid. It is anticipated that additional injection points will be added to the grid and/or around the perimeter of the grid to affect the highest compound concentrations surrounding MW-31.

2.3 Permits and Approvals

Although there are no specific permit requirements, in accordance with the Code of Federal Regulation (CFR) 40CFR 144.26, the United States Environmental Protection Agency (EPA) will be notified of execution of this MW-31 WP, which entails the application of RegenOx® ORC

Advanced® fluids into the subsurface. Pending the NYSDEC approval of the MW-31 WP, Evonik will submit the *Inventory of Injection Wells* form as required by the EPA and presented in Appendix 3.

2.4 Summary of Proposed Post-Remedial Monitoring and Reporting

Quarterly ground water monitoring for one year is proposed subsequent to conducting the full-scale RegenOx® ORC Advanced® application. The first quarterly round of post-remedial ground water monitoring will be conducted six weeks after the field application as the first quarterly event, to assess the initial response and effectiveness of the RegenOx® ORC Advanced® treatment. The post-application groundwater monitoring program will consist of sampling MW-31, MW-36, MW-37, and the three newly installed wells, MW-70, MW-71 and MW-72 (Figure 2). The groundwater samples will be analyzed for VOCs+15 and a search for MIBK and 1,4-dioxane, as well as indicator parameters. As previously discussed, MW-24 will be included in the post-remedial monitoring plan for the first quarterly sampling event.

The quarterly ground water monitoring program is proposed to evaluate the effectiveness of the in-situ remediation program. Upon completion of the first year of monitoring and evaluation of the analytical data, a report of findings with applicable conclusions and recommendations will be submitted to the NYSDEC in accordance with the proposed schedule in Section 3.0.

2.5 Quality Assurance/Quality Control

The proposed field sampling and laboratory analyses procedures will be designed to ensure that the data generated is representative of the conditions at the site. In order to ensure that representative data is generated during the project, the following quality assurance/quality control (QA/QC) measures, at a minimum, will be implemented:

- Samples will be collected in accordance with applicable field sampling procedures.
- The designated field leader will manage all samples collected in the field.
- Collection of samples will be documented on Field Activity Daily Log sheets and Chain of Custody forms when submitted to the sample laboratory.
- QC procedures (e.g., collection of field blanks and trip blanks) shall be used to evaluate potential contamination attributable to collection and handling activities. QA/QC samples will

be treated as standard samples and logged into the field notes prior to submittal to the laboratory.

- Laboratory QC checks will be performed to ensure that lab systems (instrumentation, sample preparation, analysis, etc.) are operating with acceptable QC guidelines. These checks include method blanks, instrument blanks, calibration verifications samples, matrix spikes, sample duplicates and control blank sample (based on availability from USEPA).
- The laboratory analytical data package deliverables will be the same as was previously provided for the long term ground water monitoring program for the site. Laboratory data deliverables will include a title page, chain of custody documentation, a methodology review, a laboratory chronicle, a conformance/non-conformance summary, an analytical results summary and appropriate QA/QC summaries.

2.6 Health and Safety Plan and Community Air Monitoring Plan

Site personnel and subcontractors at the site will have completed 40 hours of hazardous waste operations training and annual refresher training by a qualified instructor, as defined by Occupational Safety and Health Administration (OSHA) regulation 29CFR 1910.120.

A copy of the site-specific Health and Safety Plan (HASP) is presented in Appendix 4. The HASP assigns responsibilities, establishes personnel protection standards and mandatory safety practices and procedures, and provides for contingencies that may arise during the site operations. The HASP was developed based on the results of the previous site investigations in order to limit potential health impacts to project personnel during the execution of the project and will remain on-site during the course of the project described in this WP.

Since the scope of work of this proposed remedial action (in-situ treatment of ground water) is not expected to create fugitive dusts nor create direct exposure scenarios to the subsurface ground water impacts, the development a Community Air Monitoring Plan is not considered warranted. Field personnel will monitor ambient air conditions during the in-situ application with a photoionization detector (PID). If the Threshold Limit Value (TLV) action level for benzene of 0.5 ppm in the breathing zone is recorded on the PID, field personnel must assess respiratory hazards with Health and Safety Officer.

3.0 Schedule

The proposed in-situ ground water remediation, monitoring, and reporting requirements will be conducted in accordance with the implementation schedule presented below, subject to approval of the MW-31 WP by the NYSDEC. Modifications to the project scope or schedule will be presented in future correspondence, as warranted by field conditions and/or NYSDEC requirements.

MW-31 WORKPLAN
IMPLEMENTATION SCHEDULE
FORMER KAY FRIES SITE
STONY POINT, NEW YORK
SITE NO. 334023
ECM PROJECT NO. 1192

PROJECT TASK	*PROJECTED COMPLETION DATE*
Meeting with NYSDEC to review draft MW-31 Workplan	January 2012
Finalize MW-31 Workplan and submittal to the NYSDEC	March 2012
NYSDEC Approval of MW-31 Workplan and EPA Notification	March 2012
Mobilization and Installation of Proposed Monitoring Wells	May 2012
Baseline Groundwater Monitoring (including MW-24 and PZ-23)	June 2012
Receipt and Review of Baseline Data; Work Plan modification (if warranted)	July 2012
Equipment Procurement (RegenOx® ORC Advanced®) and Site Mobilization	August 2012
Full-Scale Remedial Application	August/Sept. 2012
1st Post-Remedial Quarterly Ground Water Sampling Event and Water Levels (including MW-24 and PZ-23)	Oct. – Dec. 2012
2nd Quarterly Ground Water Sampling Event and Water Levels	Jan. - March 2013
3rd Quarterly Ground Water Sampling Event and Water Levels	April – June 2013
4th Quarterly Ground Water Sampling Event and Water Levels	July – Sep. 2013
MW-31 Workplan Findings Report (with Evaluation and Recommendations)	November 2013

4.0 Professional Engineer Certification

I, Richard W. Chapin, P.E., certify that I am currently a NYS registered professional engineer and that this Report Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in general conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Name Richard W. Chapin, P.E.

Signature

Date 5 March 20

P.E. Registration No.: 072300 State: NY

TABLES

Table 1

Historical Summary of Detected Volatile Organic Compounds for Monitoring Well MW-31(ug/L)

Former Kay Fries Site

Evonik Degussa Corporation, Stony Point , New York

ECM Project No.1192

Volatile Organics	Dec-90	Feb-97	May-97	Aug-97	Nov-97	May-98	Aug-98	May-99	Nov-99	May-00	Nov-00	May-01	Nov-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Oct-05	Jun-06	Oct-06	Apr-07	Oct-07	Apr-08	Apr-09	Dec-09	Jun-10	Nov-10	Apr-11	Aug-11	GWQS
1,1,1 Trichloroethane	**310**	**17**	**80**	ND	ND	4.5	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1-Dichloroethane	**1,700**	**1300**	**1500**	**570**	**98**	**200**	**87**	**19**	1	**43**	1.8	**6.6**	ND	ND	ND	**12**	ND	**12**	ND	ND	ND	ND	**36**	ND	ND	ND	ND	ND	ND	1.7J	0.31J	5
Chloroethane	**780**	**370**	**290**	**390**	**240**	**120**	**460**	**59**	**190**	**99**	**500**	**50**	**350**	**1000**	**900**	**550**	**570**	**270**	**150**	**5.7**	**190**	**18**	**670**	3.6	**440**	**820**	**750**	**110**	**250**	**540**	**260**	5
Vinyl Chloride	ND	**11**	ND	**8.8**	**2.9**	**2.5**	**2.3**	ND	ND	ND	**3.2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2
Chlorobenzene	**55**	**160**	**180**	**210**	**81**	**41**	**110**	**18**	**49**	**66**	**84**	**27**	**72**	ND	**140**	**110**	**270**	**53**	**200**	**250**	**110**	**230**	**100**	**190**	**150**	**190**	**200**	**160**	**220**	**210**	**240**	5
Benzene	ND	**89**	**84**	**130**	**61**	**21**	**42**	**8.1**	**29**	**27**	**35**	**7.5**	**31**	**28**	**41**	**26**	**55**	**14**	**46**	**28**	**16**	**27**	**26**	**14**	**27**	**33**	**38**	**14**	**28**	**32**	**22**	1
Toluene	**7**	1.9	2.4	1.9	1.8	ND	ND	ND	0.5	ND	ND	ND	ND	**76**	ND	ND	1.4	ND	0.7	1	ND	0.9	ND	0.9	ND	3.2	ND	ND	0.73J	0.91J	0.79J	5

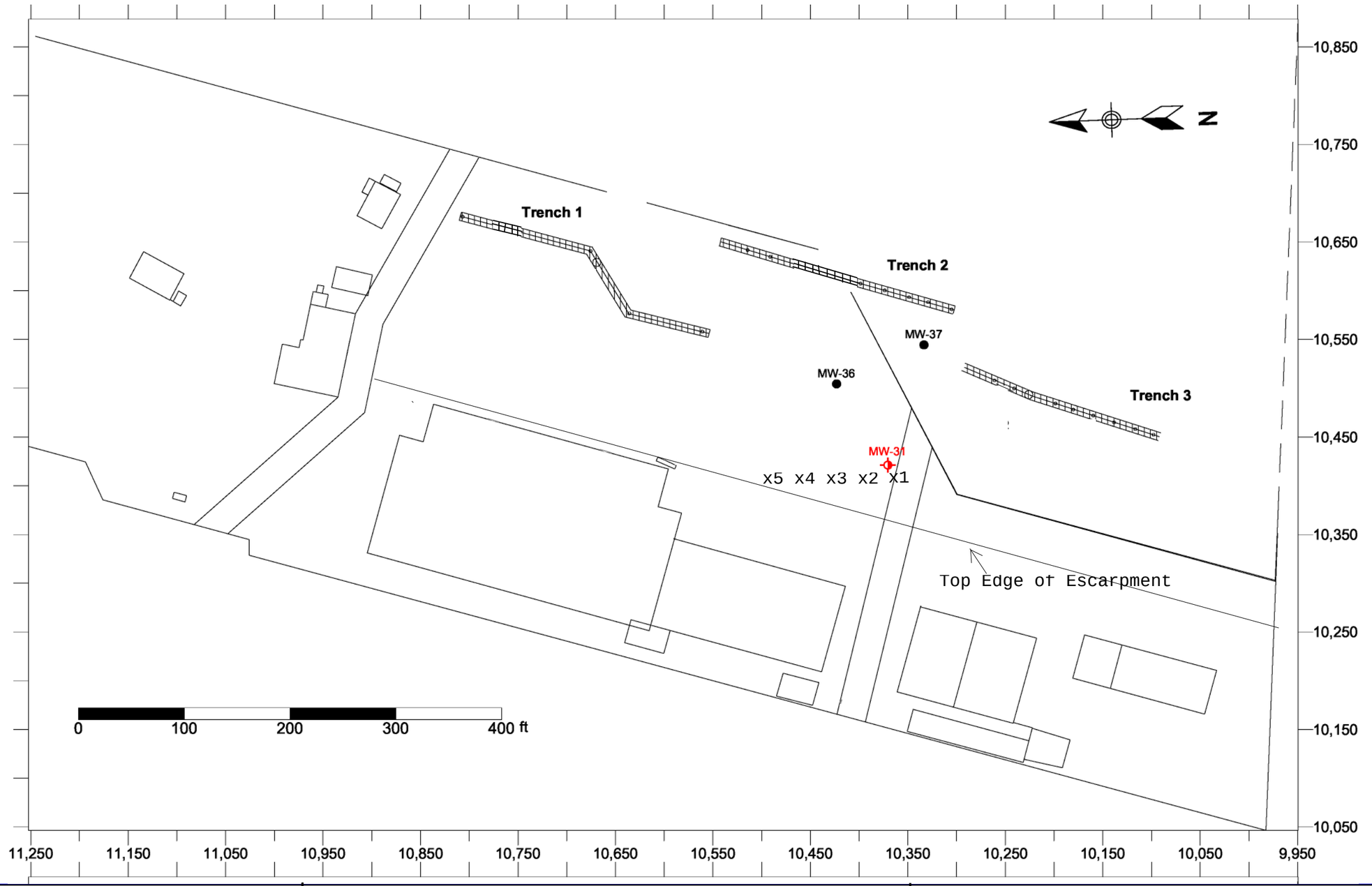
Note:

ND = Compound Not Detected Above Laboratory Method Detection Limit (MDL).

Bold: Results Exceeds NYSDEC GWQS.

J: Estimated value greater than the MDL but lower than the Reporting Limit (RL).

FIGURES



x1 - Pilot Study Injection Point Locations

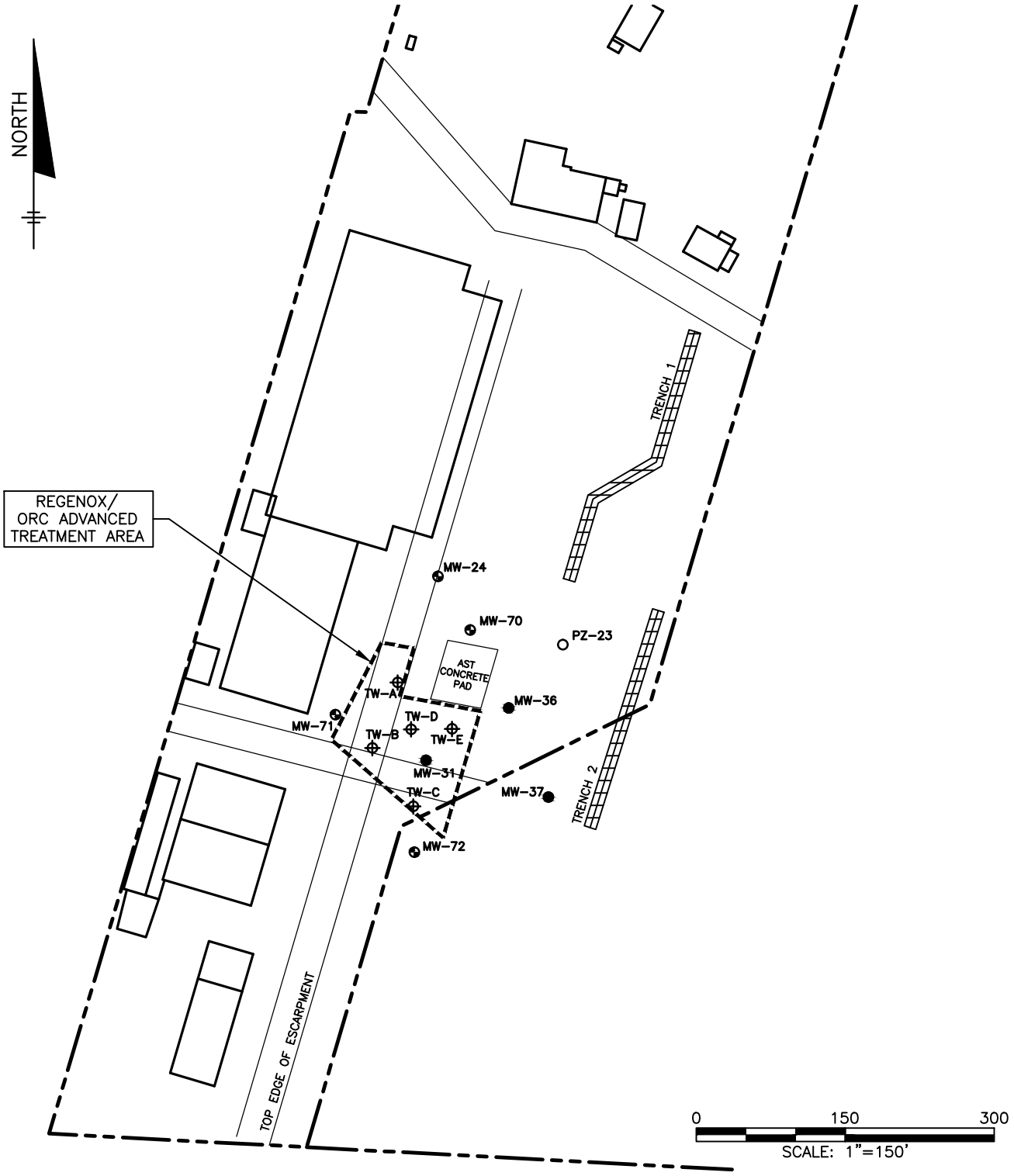
Base Map:
Hoch Surveyors and Engineers, P.C. , Existing Conditions Sheet
Rockland Organics Inc. (11/30/90), and
Topographic and Grading Sheet 1 INSL-X Products Corp. (10/1/89)
Piezometer and Well Survey Control; Drabick (7/93, 3/97, 12/97)

Figure 1
July 2008 Pilot Study Injection Point Locations

Operable Unit 1
Former Kay Fries Site
Stony Point, New York

ECM
environmental compliance monitoring, inc.

349 Route 206, Hillsborough, New Jersey 08844



LEGEND

PZ-23	EXISTING PIEZOMETER LOCATION
MW-70	PROPOSED MONITORING WELL LOCATION
TW-A	DISTRIBUTION ASSESSMENT SAMPLE LOCATIONS
MW-31	EXISTING MONITORING WELL LOCATIONS
	PROPERTY BOUNDARY

TITLE: FIGURE 2: PROPOSED MONITORING WELL LOCATIONS AND REGENOX/ORC TREATMENT AREA

OPERABLE UNIT 1 FORMER KAY FRIES SITE
STONY POINT, NEW YORK

ECM
ENVIRONMENTAL COMPLIANCE MONITORING, INC.
349 ROUTE 206
HILLSBOROUGH, NEW JERSEY 08844
(908) 874-0090

DRAWN BY:	DESIGNED BY:	APPROVED BY:	FIGURE NUMBER:
KP	BM	BM	2
DATE: 03/06/2011	SCALE: AS SHOWN	PROJECT NO.:	

FILE: G:\Clients\E\ECM\Stony Point Industrial Park\Sheets\Figure 2.dwg DATE: 3/6/2012

APPENDICES

APPENDIX 1
FEBRUARY 2003 DISTRIBUTION ASSESSMENT REPORT

ECM
environmental compliance monitoring inc.

February 13, 2003

Mr. Saiban Mahamooth
Environmental Engineer I
New York State Department of Conservation
21 South Putt Corner Road
New Paltz, New York 12561-1696

RE: MW-31 Compound Distribution Assessment
Former Kay Fries Site; Stony Point, New York
Site No. 344023
ECM Project # 1192

Dear Mr. Mahamooth:

This letter has been prepared to summarize the compound distribution assessment results relative to MW-31 located in Operational Unit - 1 (OU-1) at the above referenced site. Ground water sampling and analyses were conducted pursuant to the scope of work outlined in the Environmental Compliance Monitoring, Inc. (ECM) letter dated August 8, 2002, which was subsequently approved by the New York State Department of Environmental Conservation (NYSDEC) letter dated September 10, 2002. A summary of the sampling program and the reported analytical results is presented below.

1.0 Ground Water Sampling

A distribution assessment of the compounds historically reported in MW-31 was conducted during October 28 through October 30 2002. The assessment entailed sampling of monitoring wells and piezometers proximal to MW-31, including MW-24, MW-36, MW-37, PZ-16, and PZ-24 (Figure 1). Prior to sampling, the monitoring wells and piezometers were redeveloped via pumping for approximately one hour per location. The monitoring wells were sampled and analyzed for the volatile organic compounds (VOCs) that have been reported above the NYSDEC Ground Water Quality Standards (GWQS), including 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA), chloroethane (CA), vinyl chloride, benzene, chlorobenzene, and toluene.

To augment the monitoring well sampling program, five temporary wells, designated as TW-A through TW-E, were installed proximally to the north, south, and west of MW-31 (Figure 1). Samples were collected from these temporary wells and analyzed for the parameters outlined above. Subsequent to completion of the sampling, the temporary wells were removed. Drilling services were provided by Summit Drilling Company under the supervision of Environmental Compliance Monitoring, Inc. (ECM). The results from the monitoring program were evaluated relative to distribution, apparent migration, and attenuation potential. The monitoring well and temporary well point locations are depicted on Figure 1, while a summary of the analytical data is presented on Table 1.

349 Route 206, Hillsborough, New Jersey 08844
PHONE: 908-874-0990 FAX: 908-874-0920 *ecm-inc.@att.net*
4787 Merlot Drive, Viera, Florida 32955
PHONE: 321-636-5010 FAX: 321-636-5010

2.0 Ground Water Results

October 2002

The findings of this assessment indicated the compounds of concern were generally concentrated in the area proximal to MW-31 and located hydraulically upgradient of the active ground water recovery trenches (Figure 1). Although select target compounds were reported above the applicable GWQS in the sample points (except MW-37 and PZ-16), the highest concentrations of target compounds were reported in temporary wells TW-B, TW-D, and MW-31 (Table 1). Temporary Well TW-B was located approximately 45 feet to the west of MW-31 while TW-D was located approximately 35 feet to the north of MW-31, further depicting the localized area of the noted compounds.

Monitoring well MW-31 had the highest reported CA level (900 µg/L) while TW-B had the highest reported DCA (210 µg/L) and toluene levels (46 µg/L). TW-D had the highest reported benzene (920 µg/L) and chlorobenzene (630 µg/L) levels. As previously stated, select target compounds were also reported above the GWQS at most of the other sample locations at lower reported levels (Table 1). However, it should be noted that there were no target compounds reported above the laboratory method detection limit in monitoring wells MW-37 (between Recovery Trenches #2 and #3) and PZ-16 (up-gradient of Recovery Trench #3).

Historical Results

As part of the October 2002 assessment, a comparative review of the historical analytical data proximal to MW-31 was conducted from wells MW-24, MW-31, MW-36, MW-37, MW-38, and MW-39, which were sampled during 1990 and 1991 (summarized on Table 2). The source of the data was obtained from the *Interim Remedial Measure Construction Design Report* dated June 8, 1992 (Revised August 10, 1993 and January 4, 1994), prepared by IT Corporation. Figure 1 of this report entitled "*Phase I through Phase VI Ground Water Sampling Results and Proposed Trench Location*" presents the location of the wells (attached for reference).

The comparative review of the historical data indicated a significant decrease in compound levels proximal to MW-31 relative to the October 2002 sampling event with the exception of CA (MW-24 and MW-31) and chlorobenzene (MW-31).

A review of the historical chlorinated compounds (TCA, DCA and CA) results for monitoring well MW-31 (Table 3) document a substantial decrease in TCA and DCA levels with a moderate and fluctuating increase in CA levels. The reported trends are strong indicators that natural reductive dechlorinization processes are occurring, resulting in the documented absence of TCA and DCA and the temporary increase in CA as the daughter product. Additionally, indicator parameters collected during the distribution assessment (e.g., nitrate, sulfate, chlorides, ferrous iron, pH, oxidation reduction potential, and dissolved oxygen) indicated favorable conditions for a natural attenuation scenario (reductive dechlorinization) are present at the site.

The reported chlorobenzene levels in MW-31 (140 µg/L) and the temporary well points TW-B (500 µg/L), TW-D (630 µg/L) and TW-E (380 µg/L) indicated the migration of this compound downgradient towards Recovery Trench #2. Previously during 1990 and 1991, elevated levels of chlorobenzene were observed in wells upgradient to MW-31 at a reported level of 7,000 µg/L in MW-24 and in MW-38 of 160 µg/L. The chlorobenzene level in MW-24 has decreased to 13.9 µg/L, indicating migration downgradient towards the ground water recovery trench.

3.0 Conclusions and Recommendations

The results of the October 2002 distribution assessment document the localized distribution of select chlorinated compounds, upgradient of Recovery Trench #2. The data indicated that natural dechlorinization of the chlorinated aliphatic compounds (CAHs) is occurring in the area around MW-31 (specifically TCA, DCA, and CA). As anticipated during this process, a reduction in TCA will cause a temporary increase in DCA levels; the same can be expected as DCA reductively dechlorinates to form CA.

Additionally, the levels of these chlorinated compounds have not been detected in wells MW-61 and MW-43 downgradient of Trench 2, indicating recovery in the trench (i.e., hydraulic control) as designed. Capture of these compounds will continue to be accomplished through the operation of the GWTS.

The natural degradation processes in combination with the active ground water recovery and treatment system have been successful at controlling the migration of these chlorinated compounds. It may also be possible that the naturally occurring processes could be accelerated through an enhanced bioremediation (e.g., dechlorinization) program. Several remediation strategies are being considered and will be reviewed and presented to the NYSDEC during the second quarter of 2003.

If you have any questions relative to the information presented above, or other matters please do not hesitate to call ECM at (908) 874-0990 or Mr. Andrew Kruczek of Degussa at (973) 541-8050.

Sincerely,

Environmental Compliance Monitoring, Inc.

Bruce Manganiello
Operations Manager

cc: A. Kruczek, Degussa
G. Sheppard, Degussa
ECM File #1192-A2

Table 1
Compound Distribution Assessment Proximal to MW-31
Summary of Detected Volatile Organic Compounds (ug/L)
Former Kay Fries Site, Stony Point, New York
October 2002

Volatile Organics	MW-24	MW-31	MW-36	MW-37	PZ-16	PZ-24	TW-A	TW-B	TW-C	TW-D	TW-E	GWQS
Vinyl Chloride	ND	ND	ND	ND	ND	**35**	ND	ND	ND	ND	ND	2
Chloroethane	2.9	**900**	ND	ND	ND	ND	ND	**370**	ND	**510**	**180**	5
1,1-Dichloroethane	ND	ND	0.9	ND	ND	2.2	ND	**210**	ND	ND	ND	5
1,1,1- Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Benzene	**11**	**41**	0.6	ND	ND	**4.3**	**1.2**	**50**	**1.1**	**920**	**75**	1
Toluene	ND	ND	ND	ND	ND	ND	3.5	**46**	2.3	3.9	2.6	5
Chlorobenzene	**13.9**	**140**	**6.8**	ND	ND	**170**	**24**	**500**	24	**630**	**380**	5

Table 2
Historical Compound Distribution Proximal to MW-31
Summary of Detected Volatile Organic Compounds (ug/L)
Former Kay Fries Site, Stony Point, New York
January 1990 and June 1991

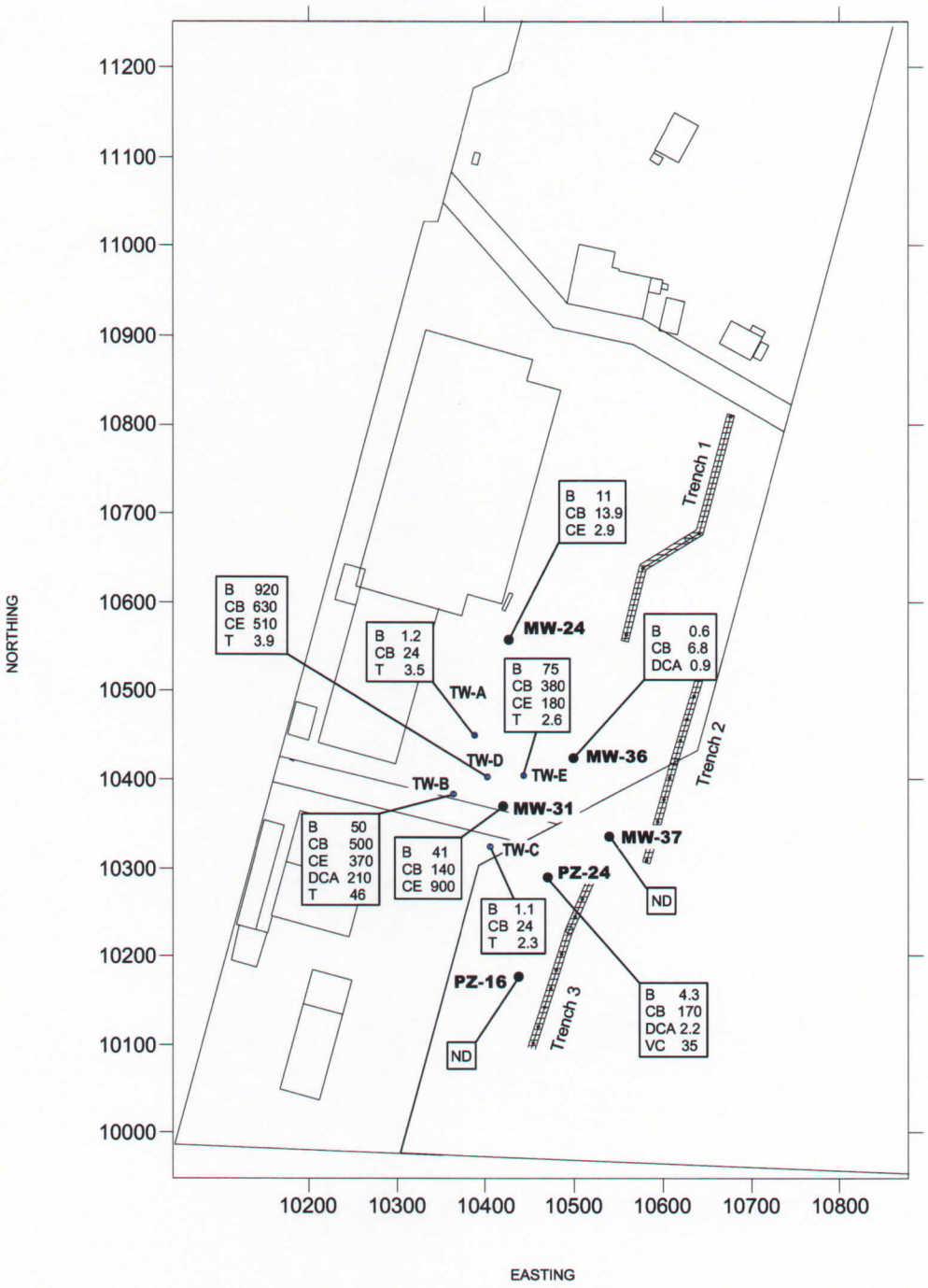
Volatile Organics	MW-24	MW-31	MW-36	MW-37	MW-38	MW-39	GWQS
Vinyl Chloride	--	--	--	--	--	--	2
Chloroethane	--	**780**	**240**	**1,500**	ND	**2,000**	5
1,1-Dichloroethane	ND	**1,700**	ND(25)	ND	ND	ND	5
1,1,1- Trichloroethane	--	**310**	ND(25)	ND	ND	ND	5
Benzene	ND(250)	ND	ND(25)	**79**	**34**	**140**	1
Toluene	**70**	**7**	ND(25)	ND	3	ND(100)	5
Chlorobenzene	**7,000**	**55**	**56**	**63**	**160**	ND(100)	5

Notes:
ND : Compound not detected above the laboratory method detection limit (MDL).
ND(250) : Laboratory MDL exceeded the Ground Water Qualtiy Standard (GWQS).
Bold : Compound reported above GWQS.
-- : Compound not reported.

Table 3
Summary of Detected Volatile Organic Compounds (ug/L)
Former Kay Fries Site, Stony Point, New York
Monitoring Well MW-31

Volatile Organics	Dec-90	Feb-97	May-97	Aug-97	Nov-97	May-98	Aug-98	May-99	Nov-99	May-00	Nov-00	May-01	Nov-01	Apr-02	Oct-02
1,1,1 Trichloroethane	310	17	80	ND	ND	4.5	ND	ND	ND	ND	1.6	ND	ND	ND	ND
1,1-Dichloroethane	1,700	1300	1500	570	98	200	87	19	1	43	1.8	6.6	ND	ND	ND
Chloroethane	780	370	290	390	240	120	460	59	190	99	500	50	350	1000	900
Vinyl Chloride	--	11	ND	8.8	2.9	2.5	2.3	ND	ND	ND	3.2	ND	ND	ND	ND
Chlorobenzene	55	160	180	210	81	41	110	18	49	66	84	27	72	ND	140
Benzene	ND	89	84	130	61	21	42	8.1	29	27	35	7.5	31	28	41
Toluene	7	1.9	2.4	1.9	1.8	ND	ND	ND	0.5	ND	ND	ND	ND	76	ND
Total VOC	2,852	1949	2137	1312	486	390	703	107	270	238	627	94	457	1104	1181

Note:
ND : Compound not detected above laboratory method detection limit.
-- : Compound not reported.



LEGEND

- B - Benzene
- CB - Cholorobenzene
- CE - Chloroethane
- DCA - 1,1-Dichloroethane
- T - Toluene
- VC - Vinyl Chloride
- ND - non-detect

Base Map:
Loch Surveyors & Engineers, P.C., Existing Conditions Sheet, Rockland Organics Inc. (11/30/90), and
Topographic and Grading Sheet 1, INSL-X Products Corp. (10/11/89)

Piezometer/Monitoring Well Survey Control:
Steven P. Drabick, P.L.S., P.C. (7/93, 3/97, 12/97)

Figure 1
Ground Water Monitoring Analytical Results (ug/L)
October 2002

Operable Unit 1 Former Kay Fries Site
Stony Point Industrial Park
Rockland County, New York

amec
Earth & Environmental
285 Davidson Avenue, Ste 100
Somerset, New Jersey 08873

APPENDIX 2
REGENESIS IN-SITU DESIGN SUMMARY

RegenOx/ORC Advanced Design Summary

Regenesis Technical Support: USA (949) 366-8000

www.regenesis.com

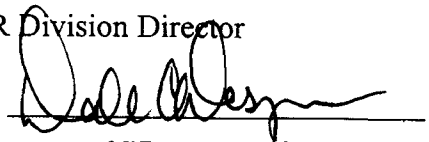
Date:	1/24/2012
Site Name:	OU-1 Former Kay Fries-plume core
Treatment Area Location:	Stony Point, NY
Consultant/Contact:	ECM (revised DaP34078 r4)

RegenOx Grid-Based Design Specifications
OU-1 Former Kay Fries-plume core
Stony Point, NY

Design Specification Summary		**Units**
Treatment Area Location	Stony Point, NY	
Treatment Areal Extent	13,200	ft^2
Vertical Treatment Thickness	7	ft
Top Treatment Interval	2	ft
Bottom Treatment Interval	9	ft
Aquifer Treatment Volume	92,400	ft^3
Method of Application (Direct Push/Inj Wells)	Direct Push	---
Soil Type (sand, silt, gravel, clay, etc.)	clayey/silty fine sand	---
Porosity	0.33	cm^3/cm^3
Effective Porosity	0.2	cm^3/cm^3
Hydraulic Conductivity	10	ft/day
Hydraulic Gradient	0.0025	ft/ft
Seepage Velocity	45.6	ft/yr
Application Design		**Units**
Number of Application Events	1	**---**
Application Frequency	na	**---**
Number of Injection Points per Event	132	---
Total Injection Points	132	---
Injection Point Spacing within row	12	ft on center
Injection Point Spacing between rows	10	
Total RegenOx Requirement	**5,892.1**	**lbs**
RegenOx Oxidant (Part A)	3,912.1	lbs
RegenOx Activator (Part B)	1,980.0	lbs
Total ORC Advanced Requirement	**2,800**	**lbs**
RegenOx A Solution %	6%	% oxidant
Part A per point per application	30	lbs
Part A per point per application per foot	4.2	lbs
Part B per Point per Application	15	lbs
Part B per application per foot	2.1	lbs
Mixing Water per Point	56	gallons
ORC Advanced per point per application	21	lbs
ORC Advanced per foot	3	lbs
Total Volume - per Point (with ORC Advanced)	60	gallons
Total Volume per foot	9	gallons
Total Volume - All Applications	7,749	gallons
Effective Pore Volume Displaced-all applications	6%	cm^3/cm^3
Linear Footage to be Drilled	1,188	ft

APPENDIX 3
USEPA NOTIFICATION
INVENTORY OF INJECTION WELLS FORM

Division of Environmental Remediation
Internal Guidance Procedure

Title: Injections for Remediation	**DER ID:** IGP- 22
Issuing Authority: Name: Dale A. Desnoyers Title: DER Division Director Signature:  Date Issued: SEP 2 2008	**Originating Unit:** Bureau: Technical Support Section: Training and Technical Support Phone: (518) 402-9553

I. Summary:

This Internal Guidance Procedure (IGP) for the Division of Environmental Remediation (DER), entitled "Injections for Remediation," establishes guidance for the introduction of fluids into the soil or groundwater for remediation to ensure technical consistency and regulatory compliance, and to provide the necessary United States Environmental Protection Agency (EPA) notification forms. This guidance is applicable to the State Superfund Program (SSF); the Environmental Restoration Program (ERP); the Brownfield Cleanup Program (BCP); the Voluntary Cleanup Program (VCP); and the Spill Response Program (SRP).

II. Purpose and Background:

Purpose - Frequently, remedies selected under one of DER's programs include injection of fluids into the groundwater or soil to effect or enhance remediation. These remedies can be technically complex and are regulated under 40 CFR Part 144, EPA's underground injection control (UIC) program. This guidance is intended to provide technical and procedural information associated with these injections and to ensure consistent interpretation of, and compliance with the EPA regulations.

Background - The frequency with which selected remedies and pilot studies include fluid injections into the soil and groundwater is increasing. Fluids are injected to enhance natural (biological) degradation, physical removal (e.g. surfactants, enzymes) or chemical oxidation (e.g. permanganate, Fenton's Reagent) of contaminants. These fluids are frequently complex, contain proprietary ingredients, or are new to staff.

Subsurface injection of fluids (including gasses[1]) are regulated by EPA's UIC program, which has not been delegated to New York. Injections of fluids for remediation are generally made via Class V UIC wells. The regulation requires notification of the construction, use, and decommissioning of a Class V injection well.

III. Responsibility:

Responsibility for interpreting and maintaining this IGP lies with the Chief of the Training and Technical Support Section, Bureau of Technical Support (BTS). Responsibility for implementing this IGP lies with DER remedial staff in both the Central and Regional Offices. Responsible Parties (RPs) are responsible for UIC compliance, including notifications on RP-lead sites.

IV. Procedure:

A. Technical Considerations

Staff must understand the makeup of the injectant as a prerequisite to consider testing or using it. Frequently, vendors or consultants propose using products which they claim contain proprietary information. Vendors are often reluctant to release detailed information on the contents of the product. The vendor must provide this information before injections can be approved. Without this information, staff cannot adequately assess the product relative to standards, criteria and guidance (SCGs), determine its safety, or evaluate the design or effectiveness of a monitoring program for the product. Proprietary information can be kept confidential by storing it in a non-FOIL folder or reviewing and returning the information.

The product vendor or consultant must also be able to explain the mechanisms by which the products remediate the contamination, provide the basis or calculations for the required dosing, and describe the potential fate of the product and byproducts in environmental media. If they can't do this to staff's satisfaction, the injection of that product should not be approved.

In cases where additional confidence is needed regarding the performance of an injection remedy due to site specific conditions or unfamiliarity with a product, well designed bench-scale/pilot tests including well thought out and comprehensive monitoring programs may be necessary. Also, depending upon the specific circumstances, active hydraulic and/or vapor control may be necessary as part of the pilot test and/or remedy.

The Technical Support Section may be consulted for assistance in the use of this technology, especially if it involves non-routine applications or materials.

B. Regulatory Considerations

1. State Pollution Discharge Elimination System (SPDES) - Injections are not subject to a SPDES permit because the injected materials are not considered an industrial discharge.

---

[1]NOTE: While injection of gasses such as ozone are regulated, the USEPA does not consider air (e.g. air sparging) to be covered.

2. Chemical Facility Anti-terrorism Standards (6 CFR Part 27) - These standards apply in the case of certain commonly used oxidants. Potassium permanganate and hydrogen peroxide (35%) are on the Department of Homeland Security list of Chemicals of Interest (COI) (Appendix A of 6 CFR Part 27) as a Theft/Diversion Explosives/Improvised Explosive Devise Precursor (EXP/IEDP) concern. If the screening threshold quantity (STQ) for these or any other chemical on the list will be exceeded, the "Top-Screen" process must be completed. The STQ is the total amount of the chemical on site. For potassium permanganate and hydrogen peroxide (35%) the STQ is 400 pounds. The Top-Screen process can be found at the Department of Homeland Security website at http://www.dhs.gov/xprevprot/programs/gc_1169501486197.shtm.The Top-Screen process is somewhat burdensome. The cost of this process should be considered when considering selection of an injectant which is a COI. Hydrogen peroxide with concentrations < 35% and potassium permanganate under 400 pounds total do not trigger compliance with these regulations. Project managers should confirm that any contemplated injectant is not on the COI list.

3. Underground Injection Control (UIC) - UIC regulations do apply. Remediation injection wells or injection points are generally considered Class V UIC wells even if no physical well remains subsequent to the injection. This includes direct-push injections.

C. UIC Program Notification

Injection well owners/operators must provide information about the Class V injection wells to the EPA prior to construction of the wells. The notification should be made at least 30 days prior to construction/injection. It is not necessary to wait for a response from EPA. Generally, injections used to enhance or effect remediation will be authorized by rule and the notification is all that is required. If EPA requires additional information or if they determine that the injection requires a permit, they will respond to the notification in writing.

1. DER or our consultant is responsible for making the notification for state-lead sites. The notification should be e-mailed to EPA using the inventory spreadsheet which was created by EPA Region 2 for exclusive use by DEC (Attachment 1). The spreadsheet file can also be found posted with this guidance on the DER internal website at http://internal/home/der/tagms/index.html#igp.

2. RPs or volunteers should make the notification for sites where they are the lead using the inventory form referenced in 40 CFR 144.26 [USEPA form 7520-16] (Attachment 2). The form can also be found posted with this guidance on the DER internal website at http://internal/home/der/tagms/index.html#igp. The notification should be made by fax or mail and should include enough details for EPA to understand the site and the proposed process and should indicate that DEC is overseeing the project. A guidance summary to inform RPs/volunteers about their responsibility is included as Attachment 3.

Notifications should be sent to:

Dennis J. McChesney, Chief,
Groundwater Compliance Section
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866
Voice (212) 637- 4232
Fax (212) 637- 4211
mcchesney.dennis@epa.gov

Once the injection activity has been completed the UIC well must be closed in a manner which protects underground sources of drinking water. The wells should be closed in accordance with DEC's Monitoring Well Decommissioning Policy which can be found at http://internal/home/der/tagms/index.html#cp. The UIC program must be notified of when and how the wells were closed.

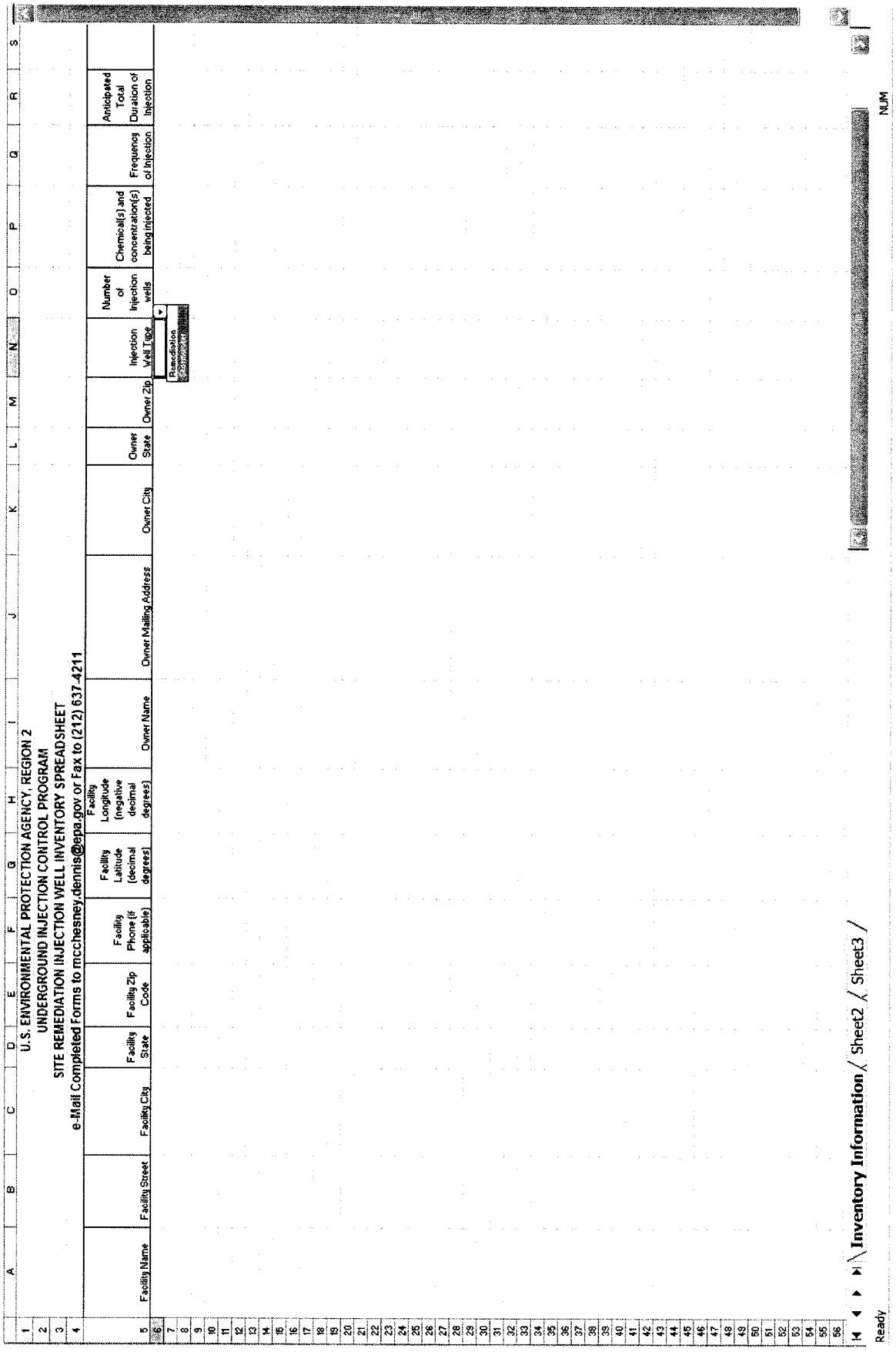
V. Related References:

- 40 CFR Subpart B - General Program Requirements, Sec. 144.12 Prohibition of movement of fluid into underground sources of drinking water
- 40 CFR Subpart C - Authorization of Underground Injection by Rule, Sec. 144.25 Requiring a permit.
- 40 CFR Subpart G - Requirements for Owners and Operators of Class V Injection Wells, Sec. 144.83 Do I need to notify anyone about my Class V injection well?
- 40 CFR Sec. 144.84 - Do I need to get a (UIC) permit?
- Protecting Drinking Water Through Underground Injection Control, Drinking Water Pocket Guide #2, USEPA
- 6 CFR Part 27 - Chemical Facility Anti-terrorism Standards.
- ITRC, DNAPLs-3, Technical and Regulatory Guidance for Surfactant/Cosolvent Flushing of DNAPL Source Zones

Attachments

Attachment 1 - Image of EPA Inventory Spreadsheet
Attachment 2 - EPA Inventory Form of Injection Wells
Attachment 3 - Guidance Summary: Underground Injection Control (UIC) Program

Attachment 1 - Image of EPA Inventory Spreadsheet



Type or print all information. See reverse for instructions.

OMB No. 2040-0042 Approval Expires 4/30/07

INVENTORY OF INJECTION WELLS

EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF GROUND WATER AND DRINKING WATER

(This information is collected under the authority of the Safe Drinking Water Act)

1. DATE PREPARED *(Year, Month, Day)*

2. FACILITY ID NUMBER

PAPERWORK REDUCTION ACT NOTICE

The public reporting burden for this collection of information is estimated at about 0.5 hour per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, and to the Office of Management and Budget, Paperwork Reduction Project, Washington, DC 20503.

3. TRANSACTION TYPE *(Please mark one of the following)*

- ☐ Deletion
- ☒ First Time Entry
- ☐ Entry Change
- ☐ Replacement

4. FACILITY NAME AND LOCATION

A. NAME *(last, first, and middle initial)*

B. STREET ADDRESS/ROUTE NUMBER

C. LATITUDE

DEG	MIN	SEC

D. LONGITUDE

DEG	MIN	SEC

E. TOWNSHIP/RANGE

TOWNSHIP	RANGE	SECT	1/4 SECT

F. CITY/TOWN

G. STATE

H. ZIP CODE

I. NUMERIC COUNTY CODE

J. INDIAN LAND *(mark "x")* ☐ Yes ☐ No

5. LEGAL CONTACT:

A. TYPE *(mark "x")* ☐ Owner ☐ Operator

B. NAME *(last, first, and middle initial)*

C. PHONE *(area code and number)*

D. ORGANIZATION

E. STREET/P.O. BOX

F. CITY/TOWN

G. STATE

H. ZIP CODE

I. OWNERSHIP *(mark "x")*

☐ PRIVATE ☐ PUBLIC ☐ SPECIFY OTHER

☐ STATE ☐ FEDERAL _____

6. WELL INFORMATION:

A. CLASS AND TYPE		B. NUMBER OF WELLS		C. TOTAL NUMBER OF WELLS	D. WELL OPERATION STATUS				
		COMM	NON-COMM		UC	AC	TA	PA	AN
				0					
				0					
				0					
				0					
				0					
				0					
				0					

COMMENTS *(Optional):*

KEY:

DEG = Degree
MIN = Minute
SEC = Second

SECT = Section
1/4 SECT = Quarter Section

COMM = Commercial
NON-COMM = Non-Commercial

AC = Active
UC = Under Construction
TA = Temporarily Abandoned
PA = Permanently Abandoned and Approved by State
AN = Permanently Abandoned and not Approved by State

EPA Form 7520-16 (Rev. 8-01)

SECTION 1. DATE PREPARED: Enter date in order of year, month, and day.

SECTION 2. FACILITY ID NUMBER: In the first two spaces, insert the appropriate U.S. Postal Service State Code. In the third space, insert one of the following one letter alphabetic identifiers:

D - DUNS Number,
G - GSA Number, or
S - State Facility Number.

In the remaining spaces, insert the appropriate nine digit DUNS, GSA, or State Facility Number. For example, A Federal facility (GSA - 123456789) located in Virginia would be entered as : VAG123456789.

SECTION 3. TRANSACTION TYPE: Place an "x" in the applicable box. See below for further instructions.

Deletion. Fill in the Facility ID Number.
First Time Entry. Fill in all the appropriate information.
Entry Change. Fill in the Facility ID Number and the information that has changed.
Replacement.

SECTION 4. FACILITY NAME AND LOCATION:

A. **Name.** Fill in the facility's official or legal name.
B. **Street Address.** Self Explanatory.
C. **Latitude.** Enter the facility's latitude (all latitudes assume North Except for American Samoa).
D. **Longitude.** Enter the facility's longitude (all longitudes assume West except Guam).
E. **Township/Range.** Fill in the complete township and range. The first 3 spaces are numerical and the fourth is a letter (N,S,E,W) specifying a compass direction. A township is North or South of the baseline, and a range is East or West of the principal meridian (e.g., 132N, 343W).
F. **City/Town.** Self Explanatory.
G. **State.** Insert the U.S. Postal Service State abbreviation.
H. **Zip Code.** Insert the five digit zip code plus any extension.

SECTION 4. FACILITY NAME & LOCATION (CONT'D.):

I. **Numeric County Code.** Insert the numeric county code from the Federal Information Processing Standards Publication (FIPS Pub 6-1) June 15, 1970, U.S. Department of Commerce, National Bureau of Standards. For Alaska, use the Census Division Code developed by the U.S. Census Bureau.
J. **Indian Land.** Mark an "x" in the appropriate box (Yes or No) to indicate if the facility is located on Indian land.

SECTION 5. LEGAL CONTACT:

A. **Type.** Mark an "x" in the appropriate box to indicate the type of legal contact (Owner or Operator). For wells operated by lease, the operator is the legal contact.
B. **Name.** Self Explanatory.
C. **Phone.** Self Explanatory.
D. **Organization.** If the legal contact is an individual, give the name of the business organization to expedite mail distribution.
E. **Street/P.O. Box.** Self Explanatory.
F. **City/Town.** Self Explanatory.
G. **State.** Insert the U.S. Postal Service State abbreviation.
H. **Zip Code.** Insert the five digit zip code plus any extension.
I. **Ownership.** Place an "x" in the appropriate box to indicate ownership status.

SECTION 6. WELL INFORMATION:

A. **Class and Type.** Fill in the Class and Type of injection wells located at the listed facility. Use the most pertinent code (specified below) to accurately describe each type of injection well. For example, 2R for a Class II Enhanced Recovery Well, or 3M for a Class III Solution Mining Well, etc.
B. **Number of Commercial and Non-Commercial Wells.** Enter the total number of commercial and non-commercial wells for each Class/Type, as applicable.
C. **Total Number of Wells.** Enter the total number of injection wells for each specified Class/Type.
D. **Well Operation Status.** Enter the number of wells for each Class/Type under each operation status (see key on other side).

CLASS I Industrial, Municipal, and Radioactive Waste Disposal Wells used to inject waste below the lowermost Underground Source of Drinking Water (USDW).

TYPE	1I	Non-Hazardous Industrial Disposal Well.
	1M	Non-Hazardous Municipal Disposal Well.
	1H	Hazardous Waste Disposal Well injecting below the lowermost USDW.
	1R	Radioactive Waste Disposal Well.
	1X	Other Class I Wells.

CLASS II Oil and Gas Production and Storage Related Injection Wells.

TYPE	2A	Annular Disposal Well.
	2D	Produced Fluid Disposal Well.
	2H	Hydrocarbon Storage Well.
	2R	Enhanced Recovery Well.
	2X	Other Class II Wells.

CLASS III Special Process Injection Wells.

TYPE	3G	*In Situ* Gassification Well
	3M	Solution Mining Well.

CLASS III (CONT'D.)

TYPE	3S	Sulfur Mining Well by Frasch Process.
	3T	Geothermal Well.
	3U	Uranium Mining Well.
	3X	Other Class III Wells.

CLASS IV Wells that inject hazardous waste into/above USDWs.

TYPE	4H	Hazardous Facility Injection Well.
	4R	Remediation Well at RCRA or CERCLA site.

CLASS V Any Underground Injection Well not included in Classes I through IV.

TYPE	5A	Industrial Well.
	5B	Beneficial Use Well.
	5C	Fluid Return Well.
	5D	Sewage Treatment Effluent Well.
	5E	Cesspools (non-domestic).
	5F	Septic Systems.
	5G	Experimental Technology Well.
	5H	Drainage Well.
	5I	Mine Backfill Well.
	5J	Waste Discharge Well.

Attachment 3

GUIDANCE SUMMARY

Underground Injection Control Program (UIC)

Remediation injection wells or injection points are considered Class V UIC wells. If a fluid is being injected into the groundwater or soil for remediation, the injection must comply with the UIC regulations.

What do you have to do?
You must notify the EPA of the construction, operation, and decommissioning of Class V injection wells. Injection well owners/operators must provide information about the wells (inventory). The notification should be made at least 30 days prior to construction and injection using the inventory form referenced in 40CFR144.26 (form OMB No. 2040-0042 [USEPA form 7520-16]). The notification should made by fax or mail and should include enough details for EPA to understand the site and the proposed process. If the site is being overseen by the NYSDEC and the NYSDEC has reviewed and approved the proposed injection, the notification should indicate this. It is not necessary to wait for a response from EPA. EPA makes the final determination as to whether the injection is authorized by rule or a permit is required. If EPA requires additional information or if they determine that the injection requires a permit, they will respond to the notification in writing.

Once the injection activity has been completed the UIC must be closed in a manner which protects underground sources of drinking water. The UIC program must be notified of when and how the wells were closed.

For questions and to submit notifications, use the following:

Dennis J. McChesney, Chief
Groundwater Compliance Section
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866
Voice (212) 637- 4232
Fax (212) 637- 4211
mcchesney.dennis@epa.gov

References:

- 40 CFR Subpart B--General Program Requirements, Sec. 144.12 Prohibition of movement of fluid into underground sources of drinking water
- 40 CFR Subpart C--Authorization of Underground Injection by Rule, Sec. 144.25 Requiring a permit.
- 40 CFR Subpart G--Requirements for Owners and Operators of Class V Injection Wells, Sec. 144.83 Do I need to notify anyone about my Class V injection well?
- 40 CFR Sec. 144.84 Do I need to get a (UIC) permit?

APPENDIX 4
SITE SPECIFIC HEALTH AND SAFETY PLAN

PLAN ACCEPTANCE FORM
PROJECT HEALTH AND SAFETY PLAN

INSTRUCTIONS: This form is to be completed by each Environmental Compliance Monitoring, Inc. employee, subcontractors, and other participants who enter into the Exclusion Zone work area during the investigation. This form is to be returned to the ECM Health and Safety Coordinator prior to site activities.

Project No: 1192

Date:

I represent that I have read and understand the contents of the above Plan and agree to perform my work in accordance with it.

_____	_____
Signed	Signed
_____	_____
Print Name	Print Name
_____	_____
Date	Date
_____	_____
Signed	Signed
_____	_____
Print Name	Print Name
_____	_____
Date	Date

ACCIDENT REPORT FORM

SUPERVISOR'S REPORT OF ACCIDENT		Do Not Use For Motor Vehicle Accident
To:		From: Telephone:
Name of injured or ill employee:		
Date of accident:	Time of accident:	Exact location of accident:
Narrative Description of Accident:		
Nature of Illness or Injury and Part of Body Involved:		Lost Time: YES_____ NO_____
Probable Disability (Check One) _____ Lost work day _____ First Aid Only _____ No lost work day _____Other (explain):		
Corrective Action Taken By Reporting Unit:		
Corrective Action Which Remains To Be Taken (By whom and by when):		
Name of Supervisor:		Title:
Signature:		Date:

PROJECT HEALTH AND SAFETY PLAN

Project Name/#:	Stony Point, NY 1192	**Project Manager:**	Bruce Manganiello
Revised:	2/29/2012 **Start**:	**Completed:**	Expected August 2012
Date:	**Time:**		

Site Location: 50 Holt Drive, Stony Point, NY 10980

Type of Work (General): GW Investigation and Remedial Action; In-situ Regenox/ORC Subsurface Injection

TASKS (THIS SHIFT): Observe and document Regenox/ORC chemical injection, site assessment, and air monitoring, well installation

PROTECTIVE CLOTHING/EQUIPMENT: Modified Level D – Safety boots and hardhat. Protective eyewear and hearing protection as necessary (e.g., during drilling activities).

CHEMICAL HAZARDS: Volatile organic compounds, Regenox/ORC (see attached Regenox/ORC injection instructions).

Potential media – ground water (sampling), Regenox/ORC reagent injection.

PHYSICAL HAZARDS: Drilling equipment (e.g., reagent injection and well installation), slip/trip hazards, utilities above and below ground.

CONTROL METHODS: Maintain exclusion zone around drilling rig, PPE, air monitoring with PID for organic vapors, safety glasses near equipment and earplugs near high noise (3-foot rule). Assess potential for utility hazard (e.g. marked lines) prior to working in each area.

SPECIAL EQUIPMENT/TECHNIQUES: **Action Level of 0.5 ppm** (TLV for VOCs) above background on PID in breathing zone. Call Project Manager/ECM Safety Coordinator and assess site respiratory hazards.

NEAREST PHONE: Call **911** first; ECM cell phone(s) 908-265-2971 for Bruce Manganiello, Project Manager

or 908-874-0990 for ECM office.

HOSPITAL NAME/ADDRESS/PHONE/DIRECTIONS: Nyack Hospital

160 North Midland Avenue, Nyack, NY 10960 (845)348-2000 (SEE ATTACHED MAP and Directions to Hospital).

Special Topics (incidents, actions taken, etc.): Verify Utility Markout and Confirmation #s with Contractors, Emphasis on rip rap rock on escarpment and high potential for slip trip and fall hazard.

SITE SAFETY BRIEFING FORM

ATTENDEES

Print Name	**Sign Name**

Meeting conducted by: _____

REGENESIS
Advanced Technologies for Groundwater Resources

RegenOx™
CHEMICAL OXIDATION REDEFINED...

INSTALLATION INSTRUCTIONS

RegenOx Part A and Part B Mixing (basic)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personnel working with or in areas of potential contact with RegenOx should be required at a minimum to be fitted with modified Level D personal protective equipment:

- Eye protection – Wear goggles or a face shield
- Head – Hard hat when required
- Respiratory – Use dust respirator approved by NIOSH/MSA
- Hands – Wear neoprene gloves
- Feet – Wear steel toe shoes with chemical resistant soles or neoprene boots
- Clothing – Wear long sleeve shirts and long pant legs. Consider using a Tyvek® body suit, Carhartt® coverall or splash gear

See also Material Safety Data Sheets (MSDS) for RegenOx Part A and Part B for support in the development of a project-specific Health and Safety Plan (HSP).

MATERIAL OVERVIEW, HANDLING, AND SAFETY

RegenOx is packaged in two parts. Part A is the RegenOx Oxidizer and Part B is the RegenOx Activator. Part A and Part B are shipped in separate 5-gallon buckets and each bucket has a gross weight of approximately 33 lbs (net weight of RegenOx is 30 lbs). The RegenOx Oxidizer is shipped as a fine white powder and the RegenOx Activator is shipped as a gel. The Activator has a viscosity roughly equivalent to cold honey. It is common for stored RegenOx Activator to settle somewhat in a container. Pre-heating the RegenOx Activator makes it easier to work with the material. A Material Safety Data Sheet for Part A (RegenOx Oxidizer) and for Part B (RegenOx Activator) is provided with each shipment. Personnel who operate field equipment during the installation process should have appropriate training, supervision, and experience.

REGENESIS
Advanced Technologies for Groundwater Resources

RegenOx™ Mixing

1. RegenOx™ is delivered on pallets.

2. RegenOx is in two parts:

Part A – the oxidizer
Part B – the activator

Each pail contains 30 lbs of RegenOx net.

Each pail weights approximately 33 lbs gross.

Quick Reference Solution Estimates

- Approximate 3% oxidant solution: 10 lbs of Part A oxidant mixed with 39 gallons of water.
- Approximate 4% oxidant solution: 10 lbs of Part A oxidant mixed with 29 gallons of water.
- Approximate 5% oxidant solution: 10 lbs of Part A oxidant mixed with 23 gallons of water.

3. Open a bucket of RegenOx Part B (activator - a greenish gel). Add about 1 gallon of water to the bucket, or approximately a 2" depth on the gel surface.

4. Thoroughly mix the water and RegenOx Part B until it is suspended in a silky mixture. Then leave it to one side while you prepare the RegenOx Part A.

5. Open a bucket of RegenOx Part A (oxidizer - a white powder). Pour it into approximately 69 to 117 gal. of water (if a large enough container is not available, mix it pro rata to the volume available).

6. Thoroughly mix the RegenOx Part A and water until the powder is dissolved (some may remain suspended). This may require 5 to 10 minutes of mixing.

7. When you are ready to inject / apply the Regenox, add the 'silky' Part B to the Part A.

8. Thoroughly mix the combined RegenOx Part A and RegenOx Part B until the mixture is even and any remaining Part A solids are dissolved.

A rusty colored solution should result, as shown.

9. The mixed RegenOx can now be directly applied to the contaminated zones.
Where contamination is shallow…RegenOx can be applied by hand, sprayed-on with a pump and hose, or applied and blended into the impacted treatment zone with excavation equipment.

Where contamination is deep…RegenOx can be applied using direct-push equipment and a suitable pump.

BUT REMEMBER…

REGENESIS
Advanced Technologies for Groundwater Resources

…successful treatment depends on **DOSE** and **CONTACT**.

RegenOx will only oxidize the contamination it contacts,...

...but when the dose and application are correct the contaminants are rapidly destroyed.

For KNOCK OUT you need

Contact,

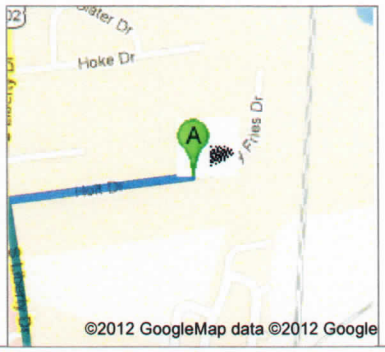
Contact,

CONTACT!

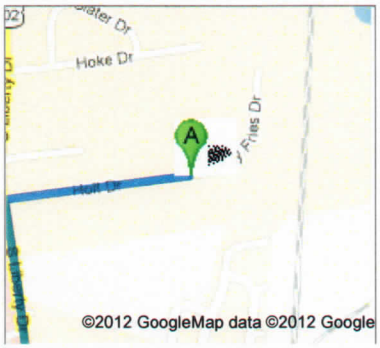
Google

Directions to 160 N Midland Ave, Nyack, NY 10960
10.8 mi – about **26 mins**

A 50 Holt Dr, Stony Point, NY 10980

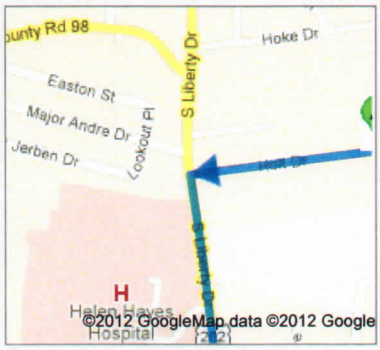


1. Head **west** on **Holt Dr** toward **S Liberty Dr**



go 0.2 mi
total 0.2 mi

9W 2. Turn left onto **US-9W S/S Liberty Dr**
Continue to follow US-9W S
About 13 mins



go 4.7 mi
total 4.9 mi

303 3. Continue onto **NY-303 S**
About 6 mins

go 3.6 mi
total 8.5 mi

4. Turn left onto **Lake Rd**

go 105 ft
total 8.5 mi

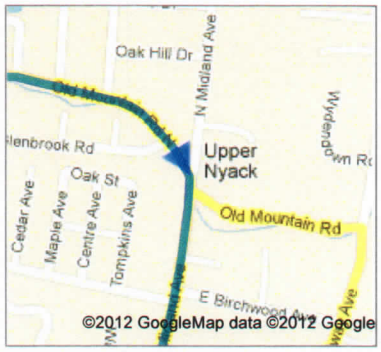
5. Take the 1st right onto **Christian Herald Rd**
About 3 mins

go 1.3 mi
total 9.8 mi

6. Continue onto **Old Mountain Rd N**

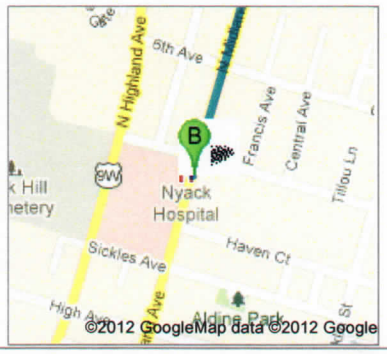
go 0.3 mi
total 10.0 mi

7. Continue onto **N Midland Ave**
Destination will be on the right
About 1 min



go 0.8 mi
total 10.8 mi

B 160 N Midland Ave, Nyack, NY 10960



These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.