Environmental
Resources
Management

16 August 2005

Girish Desai, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
Building 40 - SUNY
Stony Brook, New York 11790-2356

Re: Powers Chemco Site I.D.# 1-30-028
Pre-Design Investigation Work Plan
Glen Cove, New York

Dear Mr. Desai:

On behalf of Konica Minolta Graphic Imaging USA, Inc., (KMGI), Environmental Resources Management (ERM) is pleased to provide this Pre-Design Investigation Work Plan.

Please review this document, and if you have any questions, please do not hesitate to contact us at (631) 756-8900. Once we receive your approval, we will proceed with the investigation activities.

Very truly yours,

John Mohlin, P.E.
Project Manager

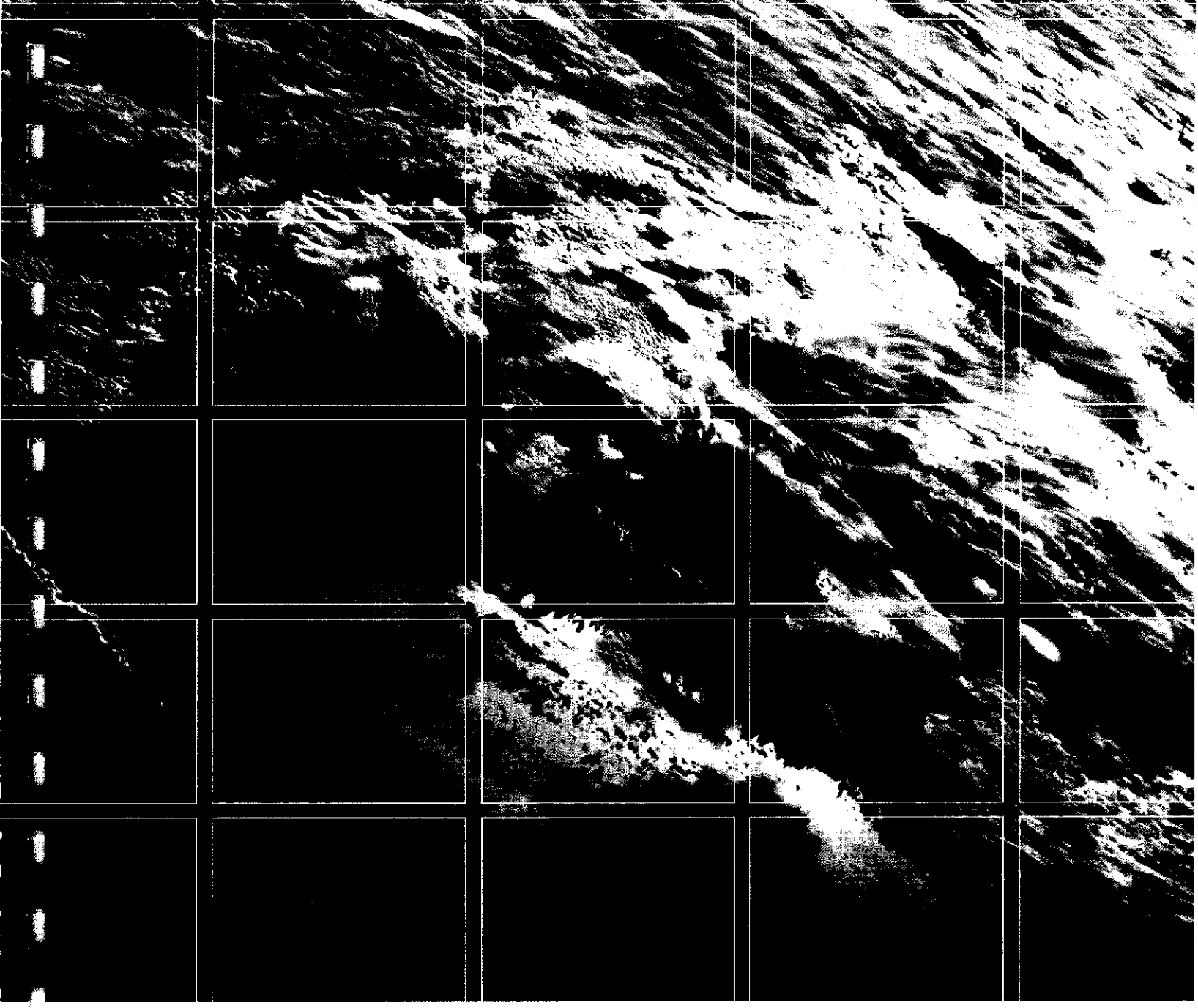
James Rocco/jm

James Rocco
Principal

Attachments

cc: D. Romeo, P.E. (KM)
I. Blundell (KM)
W. Parish (DEC)
M. Menetti (DOH)

0006435.3017



Konica Minolta Graphic Imaging U.S.A., Inc.

Pre-Design Investigation Work Plan

Former Columbia Ribbon and Carbon Company Disposal Site, Glen Cove, New York
NYSDEC Site Code No. 1-30-028

August, 2005

Environmental Resources Management
520 Broad Hollow Road
Melville, New York 11747

ERM

Delivering sustainable solutions in a more competitive world

PRE-DESIGN INVESTIGATION WORK PLAN

Former Columbia Ribbon and Carbon Company Disposal Site
Glen Cove, New York
NYSDEC Site Code No. 1-30-028

0006435.3016

August, 2005

Prepared for:

Konica Minolta Graphic Imaging U.S.A., Inc.
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SECTION 1 DIVIDER

1.0 INTRODUCTION AND PURPOSE

1.1 INTRODUCTION

This Pre-Design Investigation Work Plan describes supplemental investigation and remedial activities that are intended to address localized "hot spots" of anomalously high levels of residual volatile organic contaminants (VOCs), particularly toluene, that remain present within the footprint of the Columbia Ribbon and Carbon Manufacturing Company Site, also known as the Powers Chemco Site (the "Site") in Glen Cove, New York. The Site, which constitutes approximately 1.5 acres, is currently the North Parking Lot of the Konica Minolta Graphic Imaging, U.S.A., Inc. (KMGI) facility in Glen Cove. The Site is currently listed on the New York State Department of Environmental Conservation (NYSDEC) registry of inactive hazardous waste sites (No. 130028) as a Class 4. The supplemental remedial activities described in this Work Plan are intended to reduce residual levels of VOCs in groundwater in these localized areas to attain a level of cleanup that is consistent with the site-specific remedial objectives set forth in the Record of Decision (ROD) for the Site. The supplemental remedial activities described herein to address localized "hot spots" represent a further design modification as contemplated by the Administrative Order on Consent (Index No. W1-0547-91-07) between Konica Imaging USA, Inc and the NYSDEC. The further design modifications described in this Work Plan are expected to represent the culmination of remedial activities at the Site, with the exception of any future institutional and/or engineering controls that may be required given future use.

1.2 COMPLETED REMEDIAL ACTIVITIES

A dual phase groundwater/soil vapor extraction program, the selected remedy in the ROD, was implemented at the Site in accordance with the Remedial Design (RD) from 1994 to 1999. During that time, the selected remedy removed 12,922 pounds (lb) of toluene from groundwater and soil vapor.[1]

Shortly after final shutdown, in March 2000, the monitoring wells around the perimeter of the Site exhibited non-detectable levels of toluene, while a combined influent to the plant exhibited a toluene concentration of 1,700 micrograms per liter (ug/l). Only one perimeter well, MW-11, had

[1] The increased oxygen content in the subsurface caused by the selected remedy likely also resulted in the biological destruction of toluene and other similar VOCs, but was not accounted for in estimating the mass of toluene that was removed during implementation of the remedy.

detectable levels of other VOCs. At MW-11, the concentrations of tetrachloroethene and trichloroethene were 1 ug/l and 2 ug/l, respectively. Four quarterly rounds of post-shutdown monitoring of the perimeter monitoring wells (MW-1, MW-4, MW-5, MW-6, MW-8, MW-11, and MW-12), from June 2003 to March 2004, have reported total VOC and toluene levels ranging from non-detect to 2.7 ug/l and non-detect to 0.72 ug/l, respectively. However, groundwater samples were also collected from six wells in the interior of the Site (VRW-202, AIW-705, AIW-707, VRW-207, AIW-712, and AIW-714), which were part of the remedial system. The samples from five of these wells exhibited total VOCs ranging from 7.7 ug/l to 2,238 ug/l. The total VOC level in one of these interior wells (VRW-202) was 28,000 ug/l, with toluene at a level of 20,000 ug/l.

In December 2004, nine (9) soil borings (SB-01 through SB-09 as shown in Figure 1-1) were installed down to the water table, and one soil sample was collected for VOC analysis at each location. The purpose of these borings was to verify that no source material remained in the unsaturated zone. The locations were selected in conjunction with the NYSDEC, and included the vicinity of the highest groundwater VOC concentrations, and locations where stained soil and/or non-aqueous phase liquid (NAPL) had been detected prior to the original remedial activities. There was no evidence of impacts at any location, and therefore, soil samples were collected from one- foot above the water table. Only one volatile organic compound (VOC) was detected above its Recommended Soil Cleanup Objective (RSCO) – acetone at a concentration of 204 ug/kg at SB-04. The RSCO for acetone is 200 ug/kg. Based on these results, it was concluded that soil in the unsaturated zone is not contributing to the elevated VOC levels in groundwater.

In January and April 2005, soil vapor samples were collected from seven (7) locations (SG-01 through SG-07 as shown in Figure 1-1). Samples SG-01 through SG-05 were collected at perimeter locations; SG-06 and SG-07 were collected from within the remediation area. The VOCs detected in groundwater were present in the soil vapor samples, and the levels decreased significantly from the remediation area to the perimeter locations. Also, at the two remediation area locations, SG-06 and SG-07, chlorinated VOCs (predominantly tetrachloroethene[PCE], trichloroethene [TCE], and vinyl chloride) were detected. At SG-06 and SG-07, PCE, TCE, and vinyl chloride were detected at concentrations of approximately 6 micrograms per cubic meter (ug/m^3), 12 ug/m^3, and 120 ug/m^3, respectively. Vinyl chloride was not detected at any of the site perimeter soil vapor samples, while PCE and TCE were detected at similar levels at the perimeter.

In summary, the groundwater samples from the interior of the Site established that localized "hot spots" exist in certain areas, while the four rounds of post-shutdown groundwater results from the Site perimeter show that these residual VOCs are not readily migrating. These residual

levels contribute measurable concentrations of VOCs (including chlorinated VOCs) in subsurface soil vapor within the Site. These subsurface soil vapor levels decline near the Site boundary, a finding that is consistent with the prior four rounds of groundwater sample results from perimeter wells that showed much lower total VOC and toluene levels. Consequently, the elevated levels of VOCs in groundwater near the localized "hot spots" warrant supplemental remediation.

1.3 *REMEDIAL GOALS*

The ROD established Site-specific goals[2] for remediation that provide for:

- treatment of groundwater such that, to the extent technically feasible, the concentration of contaminants is reduced to within promulgated standards;
- ensuring that remedial activities do not increase the potential for migration of contaminated groundwater by damaging the naturally occurring confining unit; and,
- treatment of soil to prevent the recontamination of groundwater by leaching of chemicals out of the soil mass.

1.4 *OBJECTIVES OF THE SUPPLEMENTAL REMEDIAL ACTIVITIES*

The objectives of the supplemental activities described in this Work Plan are to:

1. focus treatment on areas within the Site where anomalously high levels (i.e. "hot spots") of VOCs in groundwater, particularly toluene, are present;
2. sufficiently reduce these groundwater "hot spots" to ensure that total residual VOC concentrations are reduced to within promulgated standards (Class GA Groundwater Quality Standards), to the extent technically feasible;
3. evaluate the residual levels of VOC vapors to determine their significance in requiring specific institutional and/or engineering controls (IC's or EC's);

[2] ROD , Columbia Ribbon and Carbon Manufacturing Company Site, No. 130028, NYSDEC, March 1991 (Goals for the Remedial Actions, page 7)

4. define the scope of any other EC's or IC's that may be required under various future use scenarios;

5. position the Site for a determination by NYSDEC that it is properly closed and there is no evidence of present or potential adverse impact (i.e. Class 5); [3] and,

6. satisfy Konica-Minolta's obligations under the Order on Consent (Index # W1-0547-91-07).

1.5 *OVERVIEW*

The purpose of this work plan is to describe the additional pre-design investigative elements, proposed remedy, and the remediation goals. The intent of the pre-design investigation and remedial action is to:

- Map out localized groundwater flow pathways;
- Identify any additional locations of elevated VOCs in groundwater (i.e., "hot spots");
- Identify any areas that could be contributing to the presence of chlorinated VOCs in soil vapor;
- Inject calcium peroxide to enhance bioremediation of remaining impacted groundwater; and
- Complete monitoring to assess the effectiveness of these remedial measures.

[3] With the prospect that the Site could be eligible for delisting from the inactive haz ardous site (IHWS) registry if the Department determines that any future EC's or IC's can be adequately tracked and managed by another program.

SECTION 2 DIVIDER

2.0 PROPOSED PRE-DESIGN STUDY AND REMEDIAL ACTION

Groundwater quality samples will be collected to identify any additional "hot spots" remaining in groundwater. A fluorescence background and dye-trace study will also be conducted to better understand the localized groundwater flow patterns and define optimal locations for calcium peroxide applications. Also, these tracer studies will be used to determine if groundwater contaminants could be mobilized and flushed out of the immediate injection areas.

Following these pre-design investigative tasks, calcium peroxide will be applied to the subsurface and release oxygen over the course of several months. This will stimulate aerobic biodegradation of VOCs in groundwater. Figure 1-1 identifies the current proposed locations for injection of calcium peroxide. The calcium peroxide will be injected into the three (3) focused injection areas, and downgradient diffusion areas. The focused injection locations were selected based on the levels of VOCs observed in wells VRW-202, AIW-707, and AIW-712. Based on the results of the pre-design investigation, it is possible that the injection locations will be modified.

2.1 BASELINE SAMPLING & IDENTIFICATION OF ADDITIONAL GROUNDWATER "HOT SPOTS"

In September 2003, groundwater samples were collected from six wells within the remediation area. The samples were analyzed for VOCs. VOCs were present above the GWQS in all six samples. However, three of the wells (VRW-202, AIW-707, and AIW-712) contained VOC concentrations ranging from 555 ug/l to 28,000 ug/l. Therefore, additional groundwater samples will be collected from the remainder of the North Lot remediation area to: 1) identify any other possible areas of elevated VOCs, and 2) locate the possible presence of chlorinated VOCs in groundwater at low levels, which may be contributing to the presence of chlorinated VOCs in soil vapor. In addition, these samples will document current groundwater conditions prior to in-situ remedial activities and also to further refine future calcium peroxide dose calculations. Samples will be collected by low-flow method using a peristaltic pump.

The location of the wells to be sampled is provided in Figure 1-1. A total of twenty-four (24) wells are proposed to be sampled. These wells consist of other existing air injection (AIWs) and vapor recovery wells (VRWs). The groundwater samples will be analyzed for Target Compound List (TCL) VOCs via EPA Method 624. The target detection limit for the laboratory will be the Class GA Groundwater Quality Standards (GWQS)

for each parameter. Field parameters will also be recorded for temperature, pH, conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP).

The following activities will also be performed to aid in the final design of the calcium peroxide injection program:

- A site-wide groundwater gauging event will be conducted as part of the baseline groundwater sampling. This data will be used, along with the dye tracer results, to assess groundwater flow paths.

- A measurement of depth to bottom will be conducted at VRW-202, AIW-707, and AIW-712. This will help to assess siltation, settling, and potential for clogging during injection.

- VRW-202 and AIW-707 will be sampled and analyzed for dissolved metals and total organic content. This will help to refine total oxidant demand.
- The groundwater sampling data and previous soil borings will be reviewed to refine the depths and locations of the injection points.

2.2 *FLUORESCENT DYE-TRACING (FDT) STUDY*

A background fluorescence analysis (BFA) and a fluorescent dye-tracing (FDT) study will be conducted to understand how injected calcium peroxide, and the resulting release of dissolved oxygen, may be expected to flow in the subsurface. This study will also provide a greater understanding of the general flow of impacted groundwater. This data will be used to refine the placement of calcium peroxide injection points, and to demonstrate that contaminants will not be mobilized out of the immediate injection areas.

Site-specific fluorescent dyes will be used and injected in the proposed injection wells at the Site, at varied depth intervals. Periodic groundwater samples will be collected from targeted monitoring wells and analyzed for dye concentrations. The samples will be analyzed using synchronous spectro-fluorometry (SSF). SSF is capable of detecting several different fluorescent dyes in the same water sample at the part per trillion (ppt) levels. Due to the extreme sensitivity of spectro-fluorometry, it is possible to use very low dye injection concentrations (i.e., ppt) to trace groundwater flow paths.

2.2.1 *Technology Overview and Background Sample Collection*

Fluorescence is a widespread phenomenon in nature, especially in contaminated environments with many dissolved organic substances such as those associated with degrading hydrocarbons. Fluorescence is an instantaneous emission of light that occurs when colliding photons raise molecules to higher energy levels and drop back to the ground state. The relative fluorescent intensity (RFI) measures the fluorescent yield of a substance relative to its concentration in a water sample. The advantage of fluorescence techniques rests in the very low detection limits (ppt or ng/L range) and their quantitative application. Water-soluble, non-toxic fluorescent dyes constitute a large range of hydrologic tracers, with different characteristic fluorescence "signatures".

For the BFA groundwater samples will be collected to determine the background fluorescence of groundwater at the Site. Groundwater samples will be collected from the same 24 wells that will be sampled for VOCs, plus VRW-202, AIW-707, and AIW-712. The samples will be collected using tygon tubing and a peristaltic pump.

Based upon the BFA, suitable dyes will be selected for the FDT study. Bench top laboratory experiments will be performed to determine which dyes are appropriate for FDT, which will be determined by which dyes have the least amount of spectral interferences with dissolved organic compounds in the water. The following dyes will be investigated: eosine, pyranine, rhodamine WT, sulforhodamine B, sulforhodamine G, Na-naphthionate, and uranine. None of these dyes are toxic or carcinogenic. Many of these dyes are routinely used at much greater concentrations to trace subsurface piping, such as storm system and sanitary system discharges. The table below summarizes the dyes and CAS number.

Name of fluorescent dye	Chemical abstract system (CAS) number
Na-Naphthionate	000130-13-2
Pyranine	63358-69-6
Uranine	518-47-8
Eosine	17372-87-1
Sulforhodamine B	3520-42-1
Sulforhodamine G	5873-16-5
Rhodamine WT	37299-86-8

The information gathered from the BFA will be used to determine appropriate dye type and amount of dyes to be injected. Also, these groundwater samples will be used to determine whether there is any interference with the fluorescent dyes over space and time.

2.2.2 *Fluorescent Dye Tracing Field Methods*

Once the suitable dyes and their amounts are determined, they will be injected into several site wells. Dye tracers will be poured and injected in the wells in liquid form. Since their density is similar to water, the fluorescent dyes behave similar to water once they are injected and diluted. To trace variations in flow, dye will be poured on top of the groundwater table and another dye will be injected near the bottom of the wells.

The results of the BFA will determine the final wells into which the dyes will be injected. It is anticipated that dye will be added to wells VRW-202, AIW-707, and AIW-712, at a minimum. The area around these wells is where the calcium peroxide is proposed to be added. If the groundwater sampling indicates additional VOC "hot spots", additional wells may be selected for the dye injection. Dye-tracers will be poured onto the water table in AIW-707. In VRW-202 and AIW-712, they will be injected through tubing to the bottom of the well screen using a peristaltic pump. The tubing will not be removed to avoid cross-contamination with the upper groundwater. Once the dye is applied in these wells, they will not be accessed for the duration of the dye-trace study to prevent cross-contamination.

It is anticipated that a total of ten samples will be collected periodically (see Section 2.2.3) from each of the following wells:

- Upgradient wells: AIW-701;
- Downgradient wells: AIW-706, VRW-206, AIW-708, AIW-713, VRW-209, VRW-210, AIW-713, AIW-715, and MW-5;
- Well water collected only once a week: MW-1, MW-12, MW-4, MW-6, MW-8, and MW-3R.

However the exact sample locations will be determined after completion of the BFA. Samples will be collected by other ERM field personnel to avoid cross-contamination, and sent to the ERM Spectro-Fluorometry Laboratory, located in Syracuse, NY within 24 hours of sample collection. All samples will be filtered prior to analysis using acid-washed disposable 10 mL NormJect PP Syringes and disposable Whatman GMF 0.45 µm Syringe filters.

2.2.3 *FDT Analysis*

Samples for fluorescence analysis will be collected daily (possibly even twice a day for the first few days) for one week, then twice a week for two to three weeks, and then at weekly intervals. Depending on the subsurface hydrogeologic properties, dye-tracer detection is expected to occur within two months. If preferential flow paths exist, the dye may be detected earlier. Samples will be processed immediately and reported continuously in order to establish the first dye detection at the downgradient wells. The sampling schedule may be altered depending where dye is detected first.

The FDT results, coupled with the VOC results from the groundwater sampling, will be used to select the final location of calcium peroxide injection points. Once peak dye concentrations have been achieved in the targeted monitoring wells, the specific flow pathways will be mapped out and calculations will be performed to determine the seepage velocities in the targeted remediation area.

SECTION 3 DIVIDER

3.0 PROPOSED REMEDIAL ACTION

3.1 APPLICATION OVERVIEW

Calcium peroxide will be delivered to the subsurface by placement using a direct-push drill rig (e.g., Geoprobe). In the downgradient diffusion areas, calcium peroxide will also be added to existing water recovery wells (WRWs). Figure 1-1 identifies the current proposed oxidant injection locations. The calcium peroxide that will be utilized is a food-grade oxidant. The oxidant will release oxygen over the course of several months and stimulate aerobic biodegradation of VOCs in groundwater. A site-specific Health And Safety And Emergency Response Plan will be completed and site personnel will be trained on safe calcium peroxide injection techniques before the project commences.

3.2 CALCIUM PEROXIDE APPLICATION

The results of the dye-tracer study will be used to determine the optimal placement of calcium peroxide application points. As indicated previously, it is anticipated that a focused injection area will be located around VRW-202, AIW-707, and AIW-712. The initial injection spacing in the immediate vicinity of these locations is based upon soil type, groundwater flow, and the estimated influence and rate of the injection. Oxidant will be placed into existing wells, and possibly injected, using a larger spacing at locations downgradient of these three wells (i.e., downgradient diffusion area). In general, the downgradient points will be selected perpendicular to the direction of groundwater flow. The final location of all injection and placement points will be determined by the results the additional groundwater sampling and dye tracer study.

A dose of approximately 6,000 pounds of calcium peroxide is estimated based upon currently available Site information and engineering assumptions, and this dose will be refined after review of the data from the Pre-Design Investigation. The dose amount is calculated based upon the amount of oxidant required using site-specific VOC concentrations and stoichiometry. The 6,000 pounds of calcium peroxide will be mixed with approximately 4,800 gallons of water to achieve a 15% slurry.

It is estimated that the calcium peroxide application will be conducted over the course of six days, in addition to approximately three days for set-up and site cleanup. If there is any clogging during the application, it may take longer. The calcium peroxide, a dry, granulated powder, will be mixed with water in a mobile mixing system. The mixture will be pumped

through hoses into the injection and placement points. It is estimated that a maximum of 3 gallons per minute may be injected. Injections will occur at only one point at a time. Therefore, in five hours, up to 900 gallons per day may be injected.

The slurry mix will have the potential to irritate skin and eyes. Due to its corrosive nature, health and safety measures will be implemented to avoid dermal contact. In addition to gloves and goggles, dust masks will be utilized. More details will be provided in the site-specific Site Health and Safety Plan.

Section 3.3 describes the post-injection monitoring to be conducted following calcium peroxide application. Six months following the first injection, data will be evaluated to determine whether more calcium peroxide is required.

The anticipated remedial approach provides for a contingent, second calcium peroxide application approximately six to nine months after the initial application. Site data may be used to modify the approach and dose amounts for the additional application.

3.3 *POST-APPLICATION MONITORING*

Post-application monitoring will be conducted to track groundwater treatment progress. Groundwater samples will be collected and analyzed for TCL VOCs to evaluate effectiveness of the calcium peroxide applications. The data will be reviewed to determine whether the additional calcium peroxide application is needed.

As discussed in Section 2.1, baseline sampling will be conducted prior to the first calcium peroxide application to establish existing groundwater conditions and gather data to refine peroxide dose estimates. Post-application monitoring and sampling will be conducted at specified intervals following treatment applications. It is estimated that ten (10) wells will be sampled to assess the performance of the peroxide applications. However, the final location and number of wells will be determined during the design stage. Groundwater monitoring and sampling will be conducted as outlined in the table below. Also, as indicated in the following table, soil vapor samples will be collected from the seven (7) existing soil vapor sampling points approximately twelve (12) months after the last calcium peroxide injection, and analyzed for VOCs via EPA Method TO-15. The soil vapor monitoring will help to evaluate the residual levels of VOC vapors to determine their significance in requiring specific institutional and/or engineering controls.

Sample Event	Event Timing	Monitoring Activities/ Sampling Parameters [1,2,3]
Baseline Sampling	Prior to initial peroxide injection – see Section 2.2 for detailed discussion	Field Parameters, TCL VOCs
Following Initial Calcium Peroxide Injection		
Post-Injection	1 month post-injection	Field Parameters, TCL VOCs
Post-Injection	6 months post-injection	Field Parameters, TCL VOCs
Following Second Calcium Peroxide Injection		
Post-Injection	1 month post-injection	Field Parameters, TCL VOCs
Post-Injection	6 months post-injection	Field Parameters, TCL VOCs
Post-Injection	12 months post-injection	Field Parameters, TCL VOCs
Soil vapor	12 months post-injection	VOCs via EPA TO-15

Notes:

1. Field Parameters consists of ORP, conductivity, pH, temperature, and DO measurements. These measurements will be conducted on all wells.

2. Laboratory analysis consists of TCL VOCs in approximately 10 wells (to be determined during the design stage).

SECTION 4 DIVIDER

4.0 *REPORTING*

Following the Pre-design Investigation, a remedial action implementation report will be submitted to the NYSDEC. The remedial action implementation report will: 1) summarize the pre-design investigation results (including dye-tracer study findings and baseline groundwater quality data), and 2) provide a final work plan for implementation of the calcium peroxide application. The final work plan will include details on such items as: calcium peroxide dose, location of injection/placement points, and final monitoring program.

Following the first application, a letter report will be submitted to the NYSDEC documenting the work completed, and the results of the one-month sampling event. A second letter report will be provided after collection of the six-month groundwater samples, and evaluate whether a second round of calcium peroxide application is necessary. If necessary, this second report will also indicate the scope of work for the second application. Similar reports will be issued after the one month, six month, and twelve month sampling events after the second application. The last letter report will also document the results of the soil vapor sampling.

Following the supplemental remedial activities, the data will be evaluated to determine the extent to which all remedial activities have accomplished the site-specific goals, as set forth in the ROD. This evaluation will include:

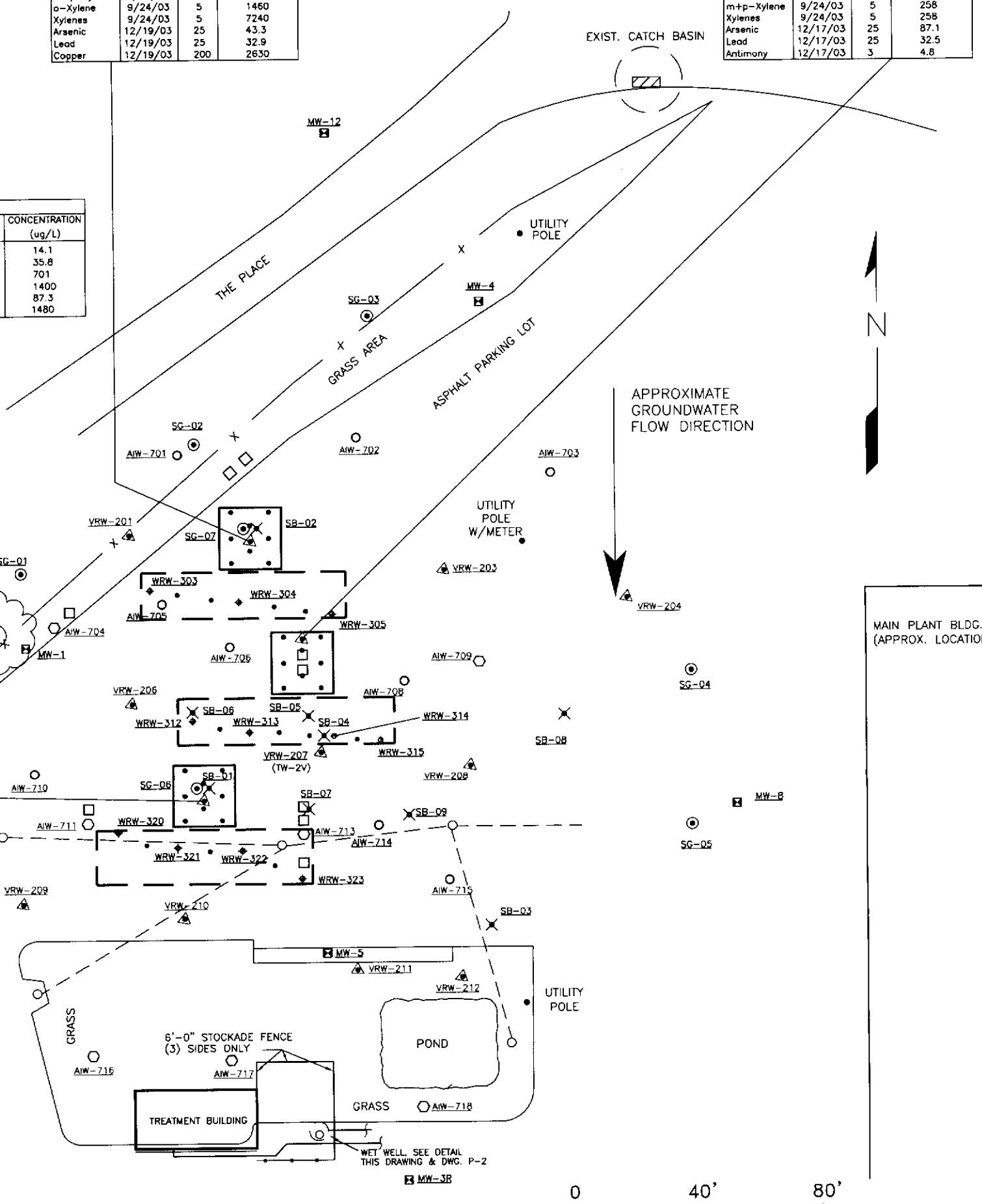
- Measurement of the decrease in VOC concentrations at individual wells;
- Evaluation of the residual groundwater VOC concentrations at areas that had been most heavily impacted;
- Evaluation of VOC levels in soil gas;
- Assessment of residual chlorinated VOC (CVOC) levels in soil vapor, and comparison to residual levels of CVOCs in groundwater; and
- Presentation of the extent of contaminant removal at the site by all historic remedial activities.

Based on this evaluation, a need for specific institutional and/or engineering controls (IC's or EC's) for various future use scenarios will be determined.

VRW-202			
PARAMETER	DATE	GWQS (ug/L)	CONCENTRATION (ug/L)
Ethylbenzene	9/24/03	5	763 J
Toluene	9/24/03	5	20000
m+p-Xylene	9/24/03	5	5780
o-Xylene	9/24/03	5	1460
Xylenes	9/24/03	5	7240
Arsenic	12/19/03	25	43.3
Lead	12/19/03	25	32.9
Copper	12/19/03	200	2630

AIW-707			
PARAMETER	DATE	GWQS (ug/L)	CONCENTRATION (ug/L)
Benzene	9/24/03	1	7.4
Chloroethane	9/24/03	5	15.6
Toluene	9/24/03	5	16.2
m+p-Xylene	9/24/03	5	258
Xylenes	9/24/03	5	258
Arsenic	12/17/03	25	87.1
Lead	12/17/03	25	32.5
Antimony	12/17/03	3	4.8

AIW-712			
PARAMETER	DATE	GWQS (ug/L)	CONCENTRATION (ug/L)
Chloroethane	9/24/03	5	14.1
Ethylbenzene	9/24/03	5	35.8
Toluene	9/24/03	5	701
m+p-Xylene	9/24/03	5	1400
o-Xylene	9/24/03	5	87.3
Xylenes(total)	9/24/03	5	1480



LEGEND

- FOCUSED VERTICAL INJECTION AREA
- DOWNGRADIENT OXIDANT DIFFUSION AREA
- OXIDANT INJECTION POINT
- SOIL GAS SAMPLING LOCATION
- WELLS WITH ELEVATED VOC CONCENTRATIONS
- ABOVEGROUND VENT FOR PASSIVE AIR INJECTION WELL
- COMBINATION PASSIVE AIR INJECTION WELL & AG VENT
- PASSIVE AIR INJECTION WELL
- MONITORING WELL
- UTILITY POLE
- SOIL BORING LOCATION
- WATER RECOVERY WELL FOR PROPOSED OXIDANT PLACEMENT

NOTES:

WELLS INDICATED IN RED ARE TO BE SAMPLED AS PART OF THE REMEDIAL DESIGN INVESTIGATION

FOR GROUNDWATER, VALUES IN TABLES REPRESENT CONCENTRATIONS OF DETECTED PARAMETERS ABOVE THE GWQS AT THE THREE TARGETED AREAS.

GWQS NEW YORK STATE CLASS GA GROUNDWATER QUALITY STANDARDS

TITLE

PROPOSED LOCATIONS FOR PRE-DESIGN SAMPLING & OXIDANT INJECTIONS

PREPARED FOR
FORMER COLUMBIA RIBBON AND CARBON COMPANY DISPOSAL SITE

Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
JPM	0006435	0006435-014	1" = 40'	1-1
			DATE 8/10/05	