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DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Schenectady International, Inc.**
Facility Address: **Rotterdam, New York**
Facility EPA ID #: **NYD002070118**

1.Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to Resource Conservation Recovery Act (RCRA) Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__X__ If yes - check here and continue with #2 below.

_____ If no - re-evaluate existing data, or

_____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The

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RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			**VOC's, SVOC's , PCB's**
Air (indoors)		X		
Surface Soil (e.g., <2 ft)	X			**VOC's, SVOC's**
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			**VOC's, SVOC's**
Air (outdoors)		X		

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Schenectady International, Inc.'s (SII) Rotterdam Junction facility is an active chemical manufacturing facility located on 60 acres at 1000 Main Street in the Town of Rotterdam in Schenectady County. SII has been in operation at the facility since 1951. Prior to SII's operation, a railroad company

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

operated the site as a switching yard. The facility is bordered on the north and east sides by the Mohawk River, on the west by unused fields and by Route 5S on the south and southwest sides. Railroad tracks are also located on the south side of the facility and enter the facility through a locked gate (the facility is surrounded by a security fence). Residential areas are located 1000 feet southwest of the facility. SII is permitted to store hazardous waste in tanks and a container storage area as well as burn hazardous waste in an incinerator. SII is currently closing some of its' tanks and the incinerator.

SII produces approximately 175,000-200,000 tons per year of phenolic resins and alkyl phenols. The resins are used by other companies to make coated and bonded abrasives; friction materials (e.g., brake linings); and rubber and adhesive materials (e.g., tire and adhesive tackification). The alkyl phenols are used by other companies to make agricultural chemicals; antioxidants; fragrances; oil field chemicals; phosphate esters; phenolic resins; and surfactants.

Figure 1 shows where each building on Schenectady International's property is located. Table 1 describes the operations performed in each building and the types of chemicals used in those operations.

Table 1
List of Buildings, Chemicals Used and Building Operations

Building Number	Chemicals	Building Operations (Draft Generic Environmental Impact Statement, 2/18/98)
1	Xylene, Toluene, Formaldehyde, Phenol, Ethyl & Cresol, Alkylphenols & Olefins	Offices, QC laboratory & pilot plant
2	Solid phenolic resins	Storage of drummed raw materials and resin grinding
3	Solid phenolic resins	Storage of drummed raw materials and resin grinding
5	Xylene, Toluene, Benzene, Formaldehyde, Phenol, Ethylbenzene, & Cresol	Storage of safety equipment
6	Xylene, Toluene, Formaldehyde, Phenol, Ethylbenzene & Cresol, Alkylphenols & Olefins	Resin and alkylphenols production
8	Phenol, Para-Octyl Phenol and Olefins	Flaking Resin production
9	Xylene, Toluene, Formaldehyde, Phenol, Ethyl & Cresol, Alkylphenols	Resin production
10	Xylene (Historically) However, all tanks and chemicals have been removed.	

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11	Solid alkylphenol	Flake Alkylphenol Warehouse
15	Solid phenolic resins	Warehouse for resin products
16	Solid phenolic resins	Warehouse
20	Ammonium Hydroxide, Hydrochloric Acid	Wastewater treatment
21		Maintenance
22		Control Room & Compressors
27		Boilers for heating steam
30		Office
34	Xylene, Toluene, Formaldehyde, Phenol, Ethyl & Cresol, Alkylphenols & Olefins	Storage area for drummed material for pilot plant
36	Xylene, Toluene, Formaldehyde, Phenol, Ethyl & Cresol, Alkylphenols	Resin production
37		HW storage & offices
38	Ammonium Hydroxide, Hydrochloric Acid	Wastewater treatment
39	Styrene (outside), Sulfuric Acid (outside)	Resin production
40		Boiler for heating steam & HW incinerator (being closed)
P-300 area	Phenol and Olefins	Production of Alkylphenols
Tank Farm area	Mixed Octyl Phenol, Formaldehyde, Xylene, Ortho-Cresol	

Since the beginning of it's operations in 1951, Schenectady International has reported many chemical spills on-site. Schenectady International was also granted a hazardous waste storage and treatment permit in 1998. As a result of both, the spills and the permitted storage and incineration activities, Schenectady International was required to determine if there was any contamination in the groundwater, surface water, soils, subsurface soils, and river sediment. If contamination was suspected, SII was required to prepare, for the New York State Department of Environmental Conservation approval, sampling plans to determine the contaminant(s) of concern and the concentration level for each contaminant for each media. If contamination was found, SII was required to prepare, for Departmental approval, a study to determine the extent of the contamination for each media. The following information discusses, for each contaminated media, some of the studies performed, the contaminants of

concern, some of the Interim Corrective Measures (ICMs) performed and if there is still contamination to be remediated. (NOTE: Contaminants of concern are those chemicals that the Department reasonably expected to be present based on the types of chemicals Schenectady International uses in its' production processes.)

Groundwater:

The facility has a natural groundwater divide created by a mounding of the impermeable silt layer in the ground. This groundwater divide splits the property's groundwater into two separate groundwater units. The groundwater east of the divide is contaminated predominantly with benzene, chlorobenzene, cresol, phenol, xylene, toluene, and ethyl benzene. The groundwater located west of the divide has very little contamination. The groundwater divide location is indicated on Figure 1 as a blue-dashed line. Because of the groundwater divide, the following discussion will deal with each side of the divide separately.

East Side

To determine if there was contamination in the groundwater, Schenectady International conducted a RCRA Facility Assessment in March, 1989 and a soil-gas survey in 1991 (reported in the East Side Investigation Report, January 1992). As illustrated by Figure 2, the soil-gas study indicated that most of the eastern side of the facility has VOC contamination under it. Based on the levels of contamination found in the soil and groundwater, the Department determined that Schenectady International should implement an Interim Corrective Measure to contain and mitigate the levels of contamination in the ground water. This Interim Corrective Measure was composed of the installation of a bentonite-clay slurry wall around the eastern groundwater unit; several groundwater extraction wells; and groundwater monitoring wells installed along the inside and outside of the wall. The location of the wells is indicated on Figure 3.

Starting in December 1994 and for every three-month period after that, Schenectady International had groundwater samples analyzed. Analytical results for the groundwater enclosed by the barrier wall system are in the "East Side Interim Corrective Measure Quarterly Monitoring Report December 1994". A characteristic set of results is listed in Table 2.

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Table 2
East Side Interim Corrective Measure
Quarterly Monitoring Report December 1994

Contaminants	Level of Contamination, Inside Wells (ppb)				Action Levels (ppb)
	OW7a-84	OW15a-85	OW21-85	OW38-94	
Benzene	290	48 (est.)	250	200	0.7
Chlorobenzene	35 (est.)	510	ND	16	5.0
2,4-Dimethylphenol	890	1500	ND	ND	1.0**
2-Methyl Phenol	670	710	ND	ND	1.0**
4-Methyl Phenol	1100	1500	ND	ND	1.0**
Phenol	15000	11000	ND	ND	1.0**
Xylene	24000	37000	6300	49	5.0
Toluene	1300	7700	180	5	5.0
Ethyl benzene	13000	5800	2600	9	5.0
Araclor-1242	ND***	ND***	ND***	ND***	0.1
Araclor-1242	ND***	ND***	ND***	ND***	0.1

*OW7a-84 has been replaced by OW7aR-96 since 1998,; OW21-85 was replaced by 21R-96 in 1996, All wells in table 2 are inside the wall; est.-Estimated; ND-Non Detect; ** All phenolic compounds shall not exceed 1ppb (NY TOGS1.1.1), ***First tested in 1996

Table 3 shows a set of typical results over recent four quarters. Analytical results for the groundwater enclosed by the barrier wall system are in the "East Side Interim Corrective Measure Quarterly Monitoring Report December 2002".

(NOTE: The information contained in Table 2 as well as the information contained in Tables 3-8, Table 10 and Table 11 indicates the typical levels of the contaminants of concern detected in the specified media. The clean-up objectives for ground water and soil are based on NYS DEC Division of water Technical and Operational Guidance Series (1.1.1) and NYSDEC Divsion of Remediation TAGM 4046 respectively. These tables include data from four contaminated wells that represent typical contamination levels in the area.)

Table 3
East Side Interim Corrective Measure
Quarterly Monitoring Report

Contaminants	Level of Contamination, Inside Wells (ppb)				Action Levels (ppb)
	OW7AR-96*	OW15a-85	OW21R-96*	OW38-94	
Benzene	5 (est)	ND	ND	95 (est)	0.7
Chlorobenzene	6 (est)	210(est)	ND	ND	5.0
2,4-Dimethylphenol	16	1100	65	78	1.0**
2-Methyl Phenol	ND	58	5(est)	ND	1.0**
4-Methyl Phenol	07 (est)	360	4(est)	3 (est)	1.0**
Phenol	1 (est)	44 (est)	3 (est)	2 (est)	1.0**
Xylene	1200	53000	6600	20000	5.0
Toluene	ND	330 (est)	33 (est)	ND	5.0
Ethyl benzene	99	3300	3600	5700	5.0
Araclor-1242	.33	ND	ND	ND	0.1
Araclor-1254	.18	ND	ND	ND	0.1

*OW7a-84 has been replaced by OW7aR-96 since 1998,; OW21-85 was replaced by 21R-96 in 1996, All wells in table 2 are inside the wall; est.-Estimated; ND-Non Detect; ** All phenolic compounds shall not exceed 1ppb (NY TOGS1.1.1)

A comparison of the data from Table 2 (1994) and Table 3 (2002) indicates that contaminant concentrations have gone down in some but not all of the East side wells. Because the main focus of the remedial program is containment and a gradual removal of contaminants, those trends are not surprising. The containment remedy, which includes both a physical barrier (slurry wall) and a hydraulic barrier (pumping wells) greatly restrictes off-site migration of the contaminated groundwater. During the past 8 years, the groundwater extraction system is estimated to have removed approximately 12 tons of contaminants (8-Year Performance Assessment Report, November 2002) from the groundwater on the East side of the facility.

There is a small strip of land between the barrier wall and the Mohawk River. Figure 2 shows this strip's location. Its width is approximately 30 feet. The soil-gas information on Figure 2 shows that portions of this strip have contamination. As part of the installation of the barrier wall, Schenectady International installed monitoring wells in the locations indicated on Figure 4. Schenectady International began taking samples of these groundwater monitoring wells every three months.

Analytical results for the groundwater under this strip of land are in the "East Side Interim Corrective Measure Quarterly Monitoring Report December 1994". Table 4 shows a typical set of results.

Table 4
East Side Interim Corrective Measure
Quarterly Monitoring Report December 1994

Contaminants	Level of Contamination, Outside Wells (ppb)				Action Levels (ppb)
	OW40-94	OW36-94	OW39-94	OW37-94	
Benzene	410	25	2 (est)	340	0.7
Chlorobenzene	45 (est)	2 (est)	ND	49 (est)	5.0
2,4-Dimethylphenol	260	14	ND	130	1.0**
2-Methyl Phenol	340	7 (est)	ND	140	1.0**
4-Methyl Phenol	460	66	ND	330	1.0**
Phenol	5500	180 (est)	ND	3100	1.0**
Xylene	9000	20	6 (est)	9600	5.0
Toluene	690	5 (est)	3 (est)	2100	5.0
Ethyl benzene	4500	65	ND	3400	5.0
Aroclor-1242	ND	ND	ND	ND	0.1
Araclor-1254	ND	ND	ND	ND	0.1

All wells in table 4 are outside the barrier wall; est.-Estimated; ND-NonDetect;
** All phenolic compounds shall not exceed 1ppb (NY TOGS1.1.1)

A typical set of the most recent sampling results, is listed in Table 5 Analytical results for the groundwater under this strip of land are in the "East Side Interim Corrective Measure Quarterly Monitoring Report December 2002".

Table 5
East Side Interim Corrective Measure
Quarterly Monitoring Report December 2002

Contaminants	Level of Contamination, Outside Wells (ppb)				Action Levels (ppb)
	OW40-94	OW36-94	OW39-94	OW37-94	
Benzene	220	73	ND	15	0.7
Chlorobenzene	45 (est)	70	ND	3 (est)	5.0
2,4-Dimethylphenol	78	4(est)	ND	ND	1.0**
2-Methyl Phenol	4 (est)	ND	ND	ND	1.0**
4-Methyl Phenol	4 (est)	6 (est)	ND	ND	1.00**
Phenol	5 (est)	3 (est)	ND	ND	1.0**
Xylene	25000	240	ND	ND	5.0
Toluene	410 J	ND	ND	ND	5.0
Ethyl benzene	13000	940	ND	ND	5.0
Aroclor-1242	ND	ND	ND	ND	0.1
Aroclor-1254	ND	.079	ND	ND	0.1

All wells in table 4 are outside the barrier wall; est.-Estimated; ND-NonDetect;
** All phenolic compounds shall not exceed 1ppb (NY TOGS1.1.1)

Figure 6 depicts the location of the East side slurry wall and the potentiometric surface associated with the pumping wells. The combined effect of the slurry wall and the pumping program has been to create a zone of groundwater flow stagnation in the thin strip of land between the river and the slurry wall. Because there is little groundwater flow within the strip, contaminant concentrations can remain elevated for extended period of time. Over time, groundwater contaminant concentrations throughout the strip should diminish as they have in wells OW37-94 and OW39-94.

West Side

There have been very few spills in the past and no spills recently on the west side of the groundwater divide. However, as with the east side, the Department required Schenectady International to conducted a number of different studies to determine the extent of contamination on the west side. These studies included a Gas-soil study in 1991 (reported in the West Side Investigation Report, January 1992), a Hydrologic Investigation in 1985, the 1988 RCRA Facility Assessment, a Supplemental RCRA Facility Investigation in 1989, West Side Investigation in 1992, the West Side Interim Corrective Measure Study in 1993, and a Detailed Hydrogeologic Evaluation in 1997. The results for the Gas-soil study are shown on Figure 4.

Schenectady International has installed many wells on the west side as part of the above-referenced studies. The well locations are indicated on Figure 3. Schenectady International began taking

quarterly samples from the west side groundwater wells in April 1997. Analytical results have been reported for each three months since that time. Analytical results for 2002 (West Side Interim Corrective Measure 2002 Annual Report) are consistent with the historical results, in that parameter detections are sporadic and at very low concentrations.

Occasionally there have been are small amounts of contaminants that are seen in the analyses of the quarterly samples. For example, Benzene was the most frequently detected contaminant in the most recent quarterly sampling events (West Side Interim Corrective Measure 2002 Annual Report) and ranged from non detect to an estimated concentration of 2ppb. However, these contaminants do not persist in any wells for any consecutive quarterly sampling. That is, they may be seen at one well during one sampling event, but are not seen later in any other wells. They appear to attenuate or become so dilute that they do not appear in the other wells.

The West Side RCRA Facility Investigation (February 2001) however revealed that there are two relatively small areas (Areas 1 and 9A) with groundwater contamination above action levels (See Figure 5 for location of these areas and Table 6 for the sample results).

Table 6
West Side RCRA Facility Investigation (February 2001)

Contaminants	Level of Contamination (ppb)		Action Levels (ppb)
	BH10-00 (Area 9A)	BH 6-00 (Area 1)	
Benzene	590	4700	0.7
Chlorobenzene	Not Detected	ND	5.0
2-Methyl Phenol	2200 (est)	2500	5.0
4-Methyl Phenol	2800 (est)	1600	50
Phenol	160000	2800	1.0
Xylene	79	17 (est)	5.0
Toluene	78	220 (est)	5.0
Styrene	61	86 (est)	5.0
Ethyl benzene	60	100 (est)	5.0

Groundwater samples were taken from the referenced and other boreholes and selected existing wells. The results above represent the high end of the contamination range. Even though the results show that the ground water in the areas 9A is contaminated, the neighboring wells indicate that the contamination appears localized. Since there is very little lateral ground water flow in area 9A, the chances of human exposure are minimal.

In Area 1, most of the groundwater contamination was detected due north-east of the area. Samples taken from existing wells 12a-84 and 12b-84 that are North of area 1 didn't reveal any significant

contamination. A part of the area was excavated to remove two underground storage tanks in June 2000 and backfilled with clean fill. Removal of the tanks, which could act as a potential source, has minimized the chances of contaminants from migrating to the groundwater. Furthermore, general lack of groundwater in Area 1 minimizes the potential of contamination migration. As most of the impacted area sits east of the groundwater divide, any migration of contaminants via groundwater is expected to be captured by the east side groundwater extraction system. There is very little lateral ground water flow on west side of the divide from Area 1.

Surface Soil and Subsurface Soil:

East Side

Because of known spills in the 1970's and 1980's; leaks from the sewer system; the presence of buried drums and because of surface soil contamination discovered during the RCRA Facility Assessment Report dated March 1988, the Department and Schenectady International are aware of surface and subsurface soil contamination. The most current information available is in the "ICM Design Report" (May 1993). As part of this design, Schenectady International took more than 90 borehole samples along the allignment of the slurry wall. The locations of these samples is indicated on Drawing No. A2 entitled "Site Plan" which is included in the letter dated 5/3/93 from Laury Bibighaus to the Regional Director. The boreholes were primarily taken along the path of the barrier wall.

The data in Table 7 were taken from the "ICM Design Report" (May 1993) and list typical soil sampling results in the zone of contamination.

Table 7
ICM Design Report (May 1993)

Contaminants	Level of Contamination in Soil (ppm)	Location of Sample	Action Levels (ppm)
Benzene	Not Detected	BH33 (18-20 feet)	0.06
Chlorobenzene	8	BH33 (18-20 feet)	1.7
Total Cresols	4.5	BH33 (18-20 feet)	0.9
Phenol	4.5	BH33 (18-20 feet)	0.03
Total Xylenes	1310	BH33 (18-20 feet)	1.2
Toluene	116	BH33 (18-20 feet)	1.5
Ethyl benzene	301	BH33 (18-20 feet)	5.5

West Side

There is some history of spills on the west side of the groundwater divide. SII has conducted a RCRA Facility Investigation to determine if there is any surface soil contamination. This study identified two areas of contamination - both located near Schenectady International's Building 40.

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The data in Table 8 were taken from the "West Side RCRA Facility Investigattion, Addendum (May 2002)".

Table 8
West Side RCRA Facility Investigation, Addendum (May 2002)

Contaminants	Level of Contamination (ppm)		Action Levels (ppm)
	BH10, 8-12 ft (Area 9A)	BH 5, 4-8ft (Area 1)	
Benzene	11	ND	0.06
Chlorobenzene	Not Detected	ND	1.7
Phenol	880	1600 (est)	0.03
Xylene	2.2	2700	1.2
Toluene	3.3 (est)	100	1.5
Ethyl benzene	4.7 (est)	570	5.5

Surface Water: Schenectady International has a permit under the State Pollution Discharge Elimination Program (SPDES) to discharge water into the Mohawk River. This permit allows them to discharge treated wastewater and storm water as long as the effluent meets the specified levels. Schenectady International must continuously monitor the water discharges from its' facility and the river. Schenectady International must submit data monthly to show that it is meeting its' discharge limits. The discharges occasionally show small amounts of contamination. The samples from the river have never shown any contamination.

Sediment: Schenectady International has conducted a study to determine if there was any chemical contamination in the sediment attributable to its operations. The data in Table 9 is taken from location 3 (outfall) noted on Table 2 of the "Off-Site Investigation Report for Rotterdam Junction Facility of Schenectady International, Inc." dated 3/9/98. This study showed that there were some very low level contributions from Schenectady International. The highest level were at their SPDES-permitted outfall. The levels were as follows:

Table 9
Off-Site Investigation Report for Rotterdam Junction Facility
of Schenectady International, Inc. March 3, 1998
Outfall Location 3

Contaminant	Level (ppb)
PCB	170
Benzene	<27
Toluene	<27
Ethyl benzene	160
Meta- and Para-Xylene	410
Ortho-xylene	180

The study also showed that these contaminants were quickly attenuated to background levels.

Outdoor Air: The only locations where personnel might be exposed to contaminated outdoor air is areas near an excavation that might release air-borne contaminants. All Schenectady International personnel are covered by a health and safety plan that complies with Occupational, Safety and Health Administration (OSHA). Also, OSHA requires that any non-Schenectady International personnel involved with any excavation comply with a health and safety plan. These health and safety plans must include training; use of personal protective equipment; medical monitoring; and air monitoring. Thus, all personnel are trained and are part of a medical monitor program. Schenectady International also analyzes the air quality near any excavation that might release air-borne contaminants. Because of all these safety procedures and because they restrict access to these areas, there are no significant exposures.

Indoor Air: Schenectady International conducted a soil-gas study in 1991. Figures 2 and 3 show the results. For the west side of the facility, the Soil-gas study showed the presence of VOC's under a number of buildings.

On the east side however, the Soil gas study results clearly indicated that most of the buildings, on the east side, have contamination under them. Thus, there is a possibility that there may be some contaminants impacting the air quality in these buildings.

Schenectady International has not yet conducted a full RCRA Facility Investigation on the east side. Therefore, plumes going under buildings are not clearly identified. However, based on all of the information presented in the groundwater section above, it can be concluded that all of the buildings could be affected by the contaminant in the groundwater. As a part of Schenectady International's health and safety plan, the facility conducts regular monitoring of indoor air quality in all work and process areas. SII submitted the following summary (table 10) of the air monitoring data (8/23/02 letter from Laury Bibighaus to Howard Brezner) from the past monitoring of indoor air in the buildings at the facility:

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Table 10
Air Monitoring Results Summary*
Rotterdam Junction

Parameter	No. of Results	Building/Area	Time Period	Comments
Acetone	7	Buildings 5, 8 & 10	10/12/90 to 4/20/98	None of the results exceed the 8-hour TWA of 500 ppm
Ammonia	13	Buildings1, 6 & 9	1/4/90 to 9/14/01	5 of the 13 results exceeded the 8-hour TWA of 25 ppm. The five exceedances were related to product handling and spill response.
Benzene	12	P-300 Area, Wastewater Treatment, and Buildings 6,10 & 40	11/27/95 to 5/3/00	3 of the 12 results exceeded the 8-hour TWA of 0.5 ppm. The air monitoring results were obtained as a result of soil excavation.
Cellosolve Acetate	58	Buildings 9, 8, & 39	12/14/95 to 9/10/00	2 of the 58 results exceeded the 8-hour TWA of 5 ppm. The two exceedances were specifically related to a single work task.
Cresols	9	Buildings 9 & 39	9/5/95 to 8/8/97	1 of the 9 results exceeded the 8-hour TWA of 5 ppm. The one exceedance was directly related to product drop.
Ethyl Alcohol	8	Building 6	7/21/89 to 11/4/97	None of the results exceed the 8-hour TWA of 1000 ppm
Formaldehyde	311	Wastewater Treatment, Raw Material Tank Farm, and Buildings 8, 9, 6, 36, 39, 34, 21 & 10	5/3/88 to 3/5/02	93 of the 311 results exceeded the ceiling level of 0.3 ppm. The results were mainly related to material handling and processing of the material.
Methyl Ethyl Ketone (MEK)	5	Contractor Trailer Area & Buildings 6 & 10	2/29/96 to 9/19/00	1 of the 5 results exceeded the 8-hour TWA of 200 ppm. The one exceedance was directly related to excavation of Building 10.
PCB (Polychlorinated Biphenyl)	25	Liquid Waste Incinerator Tank Farm, Wastewater Treatment and Buildings 6 & 9	1/24/97 to 2/18/97	None of the results exceed the 8-hour TWA of 1.0 mg/m^3 (42% Cl) and 0.5 mg/m^3 (54% Cl).
Phenol	87	P-300 Area, Wastewater Treatment, and Buildings 6, 9, 10, 16, 27, and 39	7/18/89 to 9/18/01	12 of the 87 results exceeded the 8-hour TWA of 5 ppm. The exceedances were mainly related to material handling and processing of the material.
Styrene	9	Pilot Plant	2/7/090 to 1/25/02	None of the results exceed the 8-hour TWA of 20 ppm
TDI (Toluene-2,4-Diisocyanate)	7	Building 7	10/24/97	1 of the 7 results exceeded the 8-hour TWA of 5 ppb. The one exceedance was related to process equipment.
Toluene	37	Buildings 1, 6, 9, 10 & 39	10/27/89 to 12/4/01	3 of the 37 results exceeded the 8-hour TWA of 50 ppm. The three exceedances were mainly related to material handling.
Xylene	204	Wastewater Treatment, Pilot Plant, and Buildings 5, 6, 8, 9, 10, 16 & 39	10/3/89 to 2/12/02	21 of the 204 results exceeded the 8-hour TWA of 100 ppm. The exceedances were related to material handling and soil excavation.
Vinylcyclohexene (VCH)	226	Buildings 6, 8 &9	6/12/96 to 9/21/01	18 of the 226 results exceed the 8-hour TWA of 0.1 ppm. The exceedances were related to material handling.

*Detailed data is available at the facility ; OSHA QA/QC procedures followed for sample analysis (email from Laury Bibighaus to Howard Brezner on 9/3/02), QA/QC information also available at the facility

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Even though the air monitoring data in table 10 indicates some indoor air problems, the SII attributes them to spills and chemicals used in the process and not to the groundwater contamination underlying the buildings.

As per the information provided by the facility, only building 30 on west side of the facility is used exclusively for administrative purposes. All other buildings are occupied by production staff only. Building 22 and area directly north of this building is involved in alkyl phenol process and buildings 6, 8, 9, 36 and 39 contain phenolic resin process. The remaining buildings at the site provide support facilities to the site including warehousing (2, 3, 11, 15, 16, 17) maintenance (Building 21), waste treatment (Buildings 20, 37), pilot operations (buildings 1 and 34), and boiler house (buildings 27 and 40). The groundwater associated with building # 30 (West Side), which is being used exclusively for administrative purposes, shows minimal or no groundwater contamination. No study/investigation into indoor air pathway is necessary for building # 30.

Despite the fact that there is high possibility of groundwater contamination (mostly on east side of the facility) under the other buildings, the buildings located above the subsurface contamination are involved mostly in process and process support functions. In such a setting OSHA requires that all production personnel be covered by a health and safety plan that complies with OSHA requirements.

The health and safety plan must have many components including training, medical monitoring, confined space entry permit program and air monitoring. Schenectady International has stated that it not only includes its' production personnel in this program, but also include its' non-production personnel (i.e., clerical and support staff). Area and personnel monitoring at the Rotterdam Junction facility is conducted under the Health, Safety and training department. Two certified Industrial Hygienists oversee the sampling conducted on-site and evaluate work place conditions and employee notification process have been established to notify employees of sample results. Under such settings we will defer, as per EPA guidance, to OSHA to address occupational exposures and no further assessment of impact of the subsurface contamination for EI 725 is necessary.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[2]
Groundwater	No	No	No	No	No	No	No
Air (indoors)	No	Yes	No				
Soil (surface, e.g., <2 ft)	No	No	No	Yes	No	No	No
~~Surface Water~~							
~~Sediment~~							
Soil (subsurface e.g., >2 ft)	No	No	No	Yes	No	No	No
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

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[2] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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Groundwater: To eliminate any pathways of exposures, the Department has worked with Schenectady International to implement several Interim Corrective measures. They are as follows:

Description of Corrective Action	Location	Effect of Corrective Action
Barrier Wall System - The system is composed of bentonite-clay wall, the groundwater divide and a series of extraction wells. The wall is approximately 3 feet wide and goes down 12-30 feet. It keys into an impermeable silt layer that underlies the east side of the facility. The groundwater divide prevents any migration of groundwater to the west. The wells serve two purposes - to remove contamination from the groundwater and to reduce the level of the groundwater to produce an inward gradient into the area.	It is located on the East Side of the facility. See Figure 2 for exact location.	Enclose most of the east side of facility and prevent migration of contaminated groundwater
Building 10 Contaminant Removal - Removed all of the tanks, and all contaminated soils under building down to 4 feet.	Building 10 on the east side of the facility.	Removed contaminated soil and eliminated a major groundwater contamination source from the ground.
Development of Groundwater Response Plan - The plan included the installation of wells on the perimeter of Schenectady International's property and wells on the interior part of the west side of the facility. The plan calls for Schenectady International to implement corrective measures if a contaminant plume is discovered above the trigger levels.	West Side of facility	Prevent the migration of contaminated groundwater off Schenectady International's property.

For the east side, the barrier wall and ground water extraction system has greatly reduced chemical migration offsite. Higher pumping rates and decreasing the water levels on the interior side of barrier wall has resulted in system achieving a net annual inward water gradient. On the east side of the facility, the ground water is contained,as shown on Figure 2,

by the barrier wall system and the groundwater divide and thus eliminating any pathways for human exposure. The data from Tables 2, 3, 4 and 5 show that the levels of majority of the chemical contaminants inside the barrier wall and under the strip of land outside the barrier wall are on decline.

For the west side, analytical results have indicated parameter detections sporadic and at very low concentrations except in two relatively small areas. Modeling as detailed in the Groundwater Response Plan (9/26/00) indicates that any contaminated groundwater as identified in the response to question 2 will flow either towards the Mohawk River or towards the gravel pits that are west of the facility. The Groundwater Response Plan as describe above would require Schenectady International to install a series of groundwater extraction wells, drains, barrier wall system, in situ treatment or a funnel and gate system if they detect contamination above the action levels for two quarters in the quarterly monitoring data. The modeling in the plan shows that Schenectady International would have time to implement one of these strategies if necessary to prevent migration of contaminated groundwater off-site.

No potable water is drawn from the groundwater in this area. The nearest well for potable water is located more than 1 mile northwest of the facility.

Surface and Subsurface Soils:

Trespassers are prevented from being exposed by fences, gates and regular guard patrols. There are sub-surface and surface soil pathways for workers and construction people during excavation or construction. However, there are no sub-surface and surface soil pathways for any workers or construction people in any other circumstance because

1. Workers and construction people walking around the site are not exposed because the surface soils are covered by concrete, asphalt or sod.
2. All known spills and surface soil sources have been reported and cleaned up.

The information in the response to question 2 shows that the subsurface soil on the east side of the facility is contaminated. Any time that soil is excavated people in and around the excavation could be exposed to contamination.

Recreational users of the Mohawk River can be exposed if they trespass on land owed by Schenectady International. There is a small strip of land between the barrier wall and the Mohawk River. During the installation of the barrier wall system, a number of soil samples were taken. The analyses of these samples indicated that there is substantial contamination. However, recreational users who trespass are protected from surface and sub-surface soil contamination by the sod covering the area.

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4 Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"[3] (i.e., potentially "unacceptable") because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)? **NO**

_X_ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Sub-surface Soil: The exposure by workers and construction people to sub-surface soil contamination is not significant because Schenectady International has procedures and policies in place for the mitigation of any possible exposures. People can only be exposed to subsurface soil contamination by being in or around an excavation.

Additionally, Schenectady International has an extensive health and safety program in place to prevent any exposure to people involved with construction and excavations. This program requires the people who will do the work to obtain approvals prior to the initiation of any such work. They would be required to develop a health and safety plan. This plan would have to address using personal protective equipment, preventing non-authorized personal from getting near an excavation, decontaminating equipment/personal, medical monitoring per OSHA standards, training, confine space entry, hot work permit, lockout/tagout and emergency response.

[3] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits? **NA**

__ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):**See discussion above.**

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_✓___ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **"Schenectady International, Inc." facility , EPA ID # NYD002070118, located at 1000 Main Street, Rotterdam, NY,** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Project Engineer/Geologist (signature) _____ Date 06/30/2003
(print) Dan Verrillo
(title) Environmental Geologist II

Project Manager (signature) _____ Date 06/30/2003
(print) Howard S. Brezner, P.E.
(title) Environmental Engineer II

Current Human Exposures Under Control
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Regional S&HM Engineer (signature) _____ Date 06/30/2003
(print) Clifton J. Van Gulder, P. E.
(title) Regional Solid & Hazardous Materials Engineer
(EPA Region or State) NYSDEC

NYS DEC Central Office (signature) _____ Date 06/30/2003
(print) Edwin Dassatti P. E.
(title) Director, Bureau of Hazardous Waste & Radiation Management
(EPA Region or State) NYSDEC (Central Office)

Locations where References may be found:
NYSDEC, Region 4, 1150 N. Westcott Road, Schenectady, NY 12306

Contact telephone and e-mail numbers

Howard S. Brezner, P.E.
Phone No. 518.357.2347
(e-mail)hsbrezne@gw.dec.state.ny.us

FIGURE 1

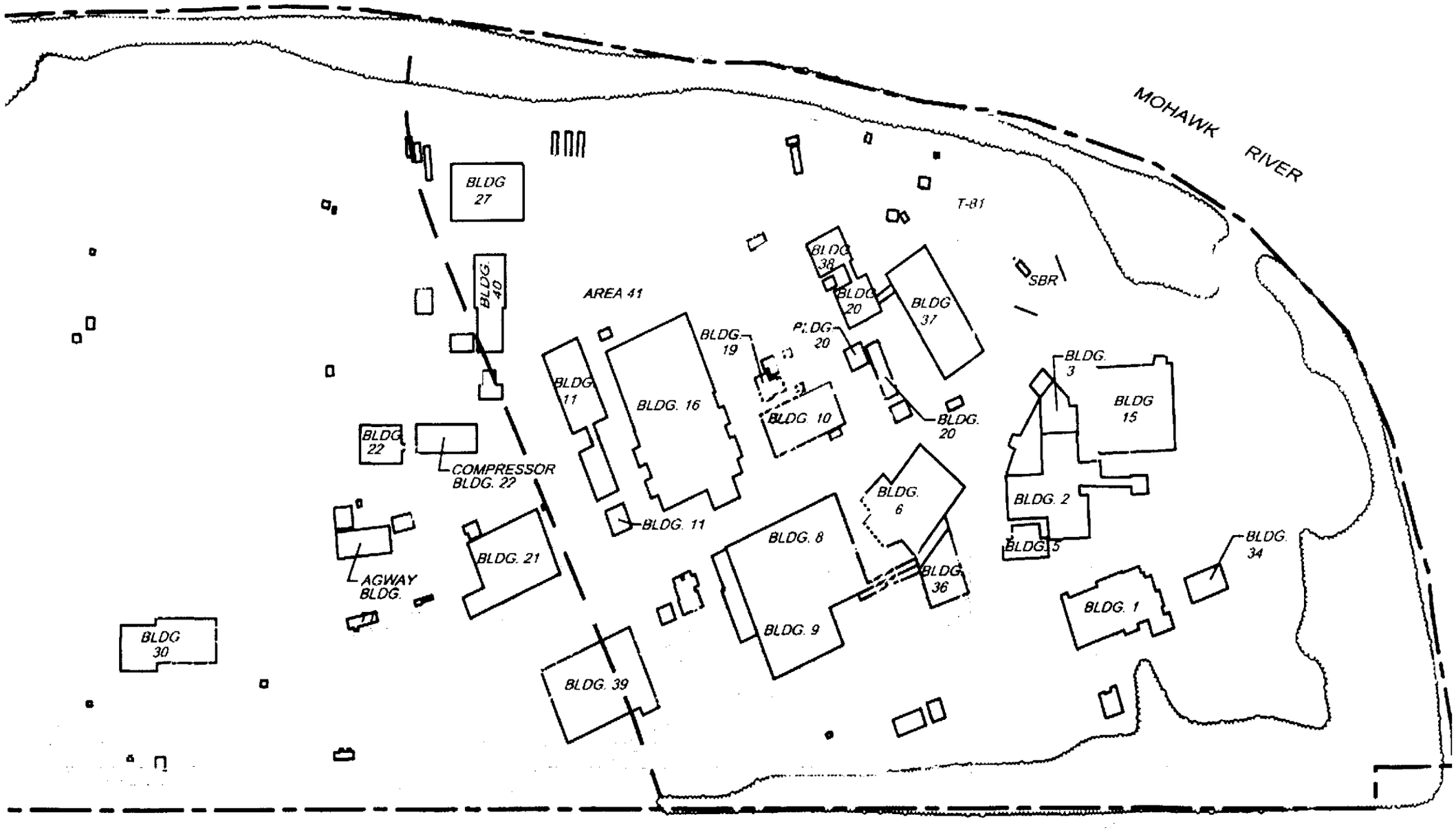
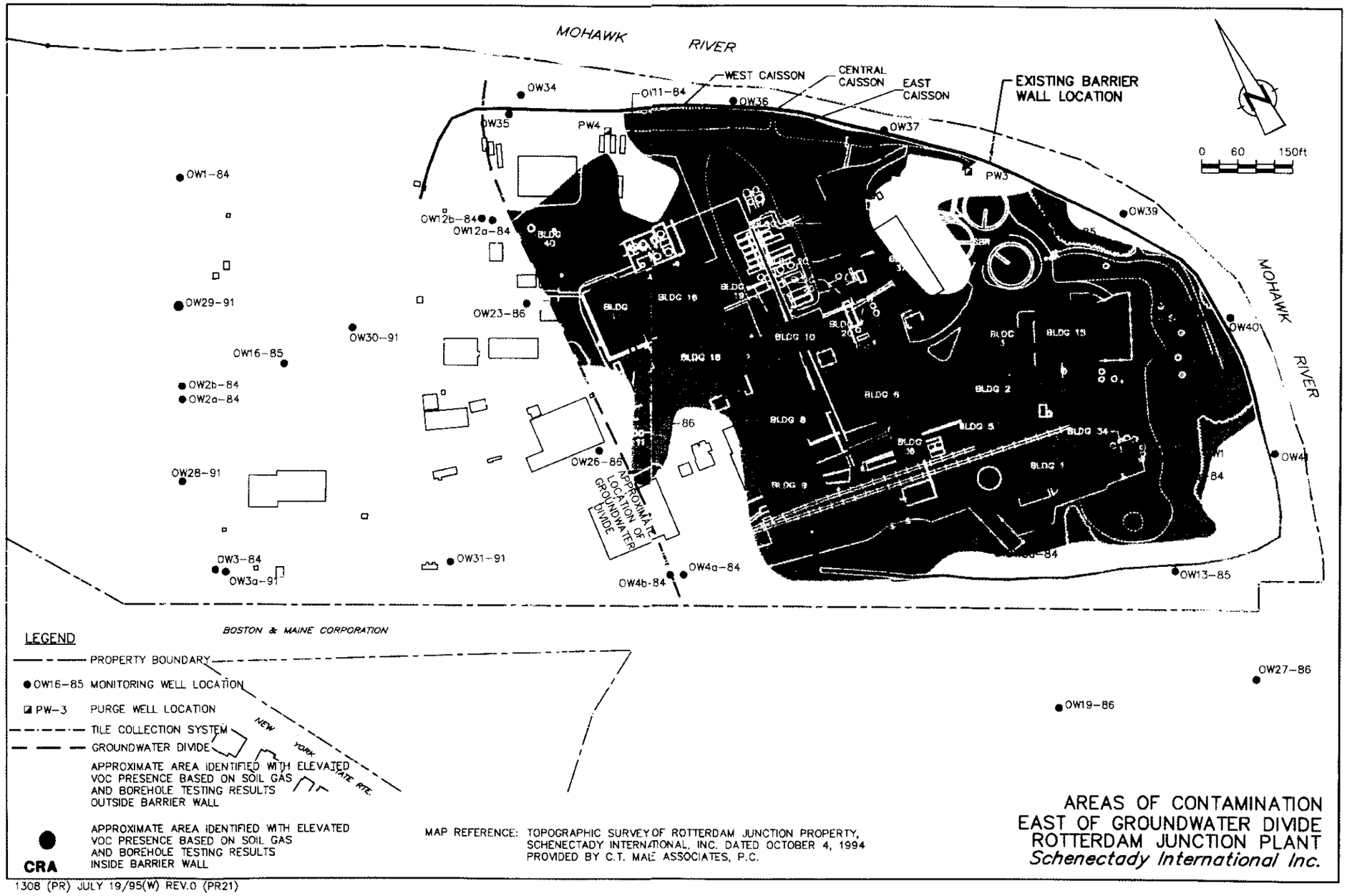
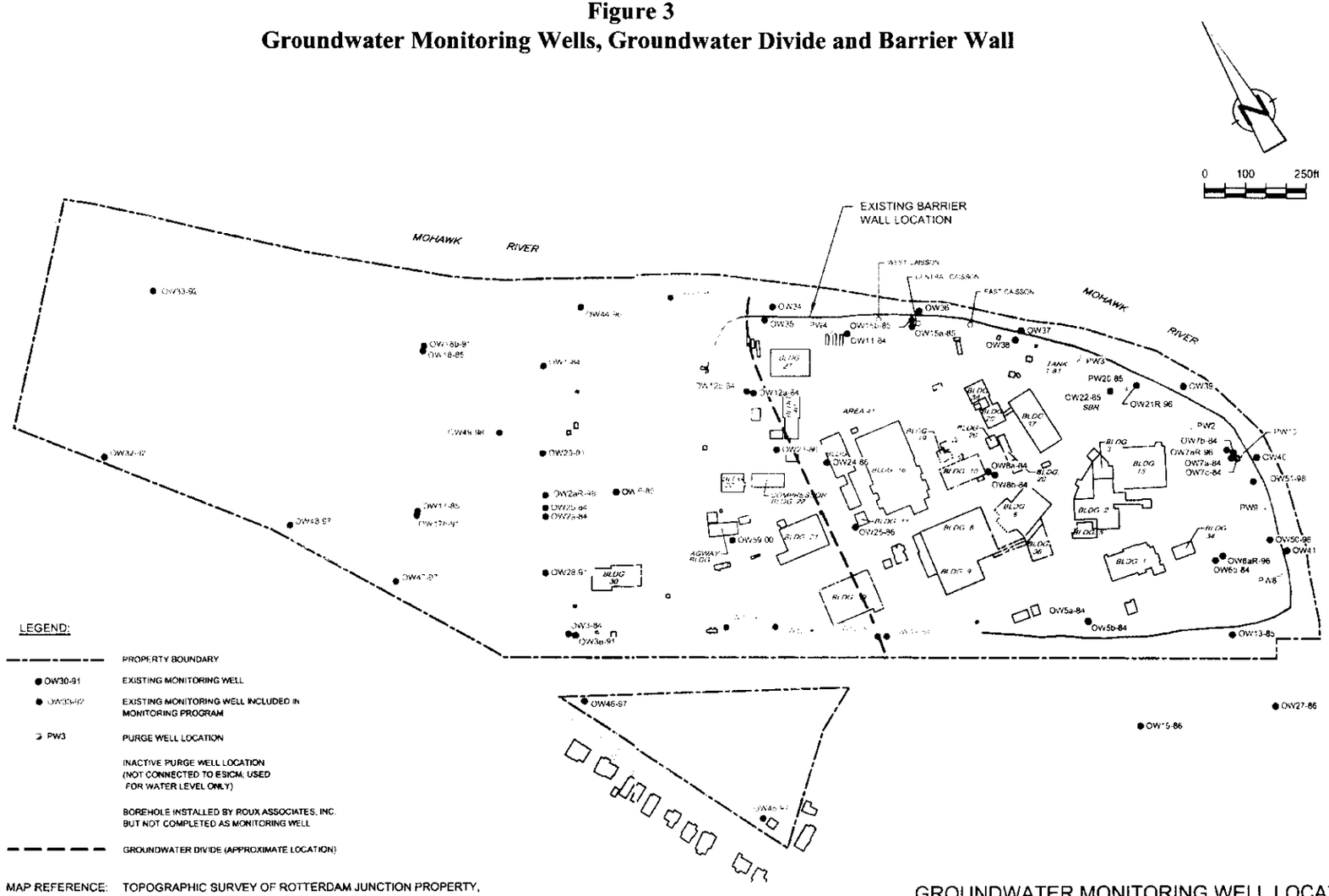

MOHAWK RIVER
BLDG 27
BLDG 40
AREA 41
T-81
SBR
BLDG 38
BLDG 20
BLDG 37
BLDG 19
BLDG 20
BLDG 11
BLDG. 16
BLDG 10
BLDG. 20
BLDG. 3
BLDG 15
BLDG 22
COMPRESSOR BLDG. 22
BLDG. 6
BLDG. 2
BLDG. 11
BLDG. 8
BLDG. 5
BLDG. 34
BLDG. 21
AGWAY BLDG.
BLDG 36
BLDG. 1
BLDG 30
BLDG. 9
BLDG. 39

Figure 2



1308 (PR) JULY 19/95(W) REV.0 (PR21)

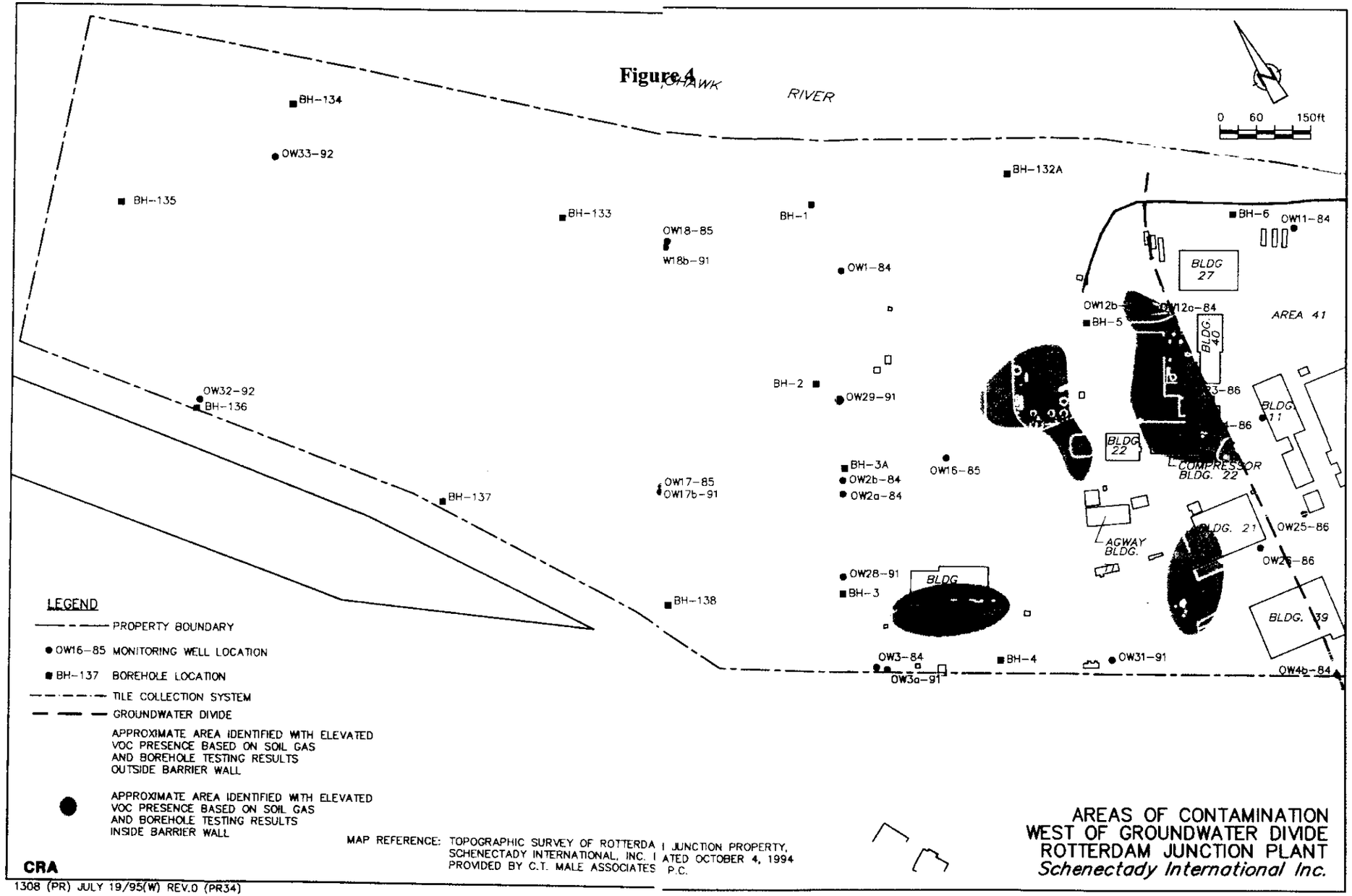
Figure 3
Groundwater Monitoring Wells, Groundwater Divide and Barrier Wall



GROUNDWATER MONITORING WELL LOCATIONS
WEST SIDE RCRA FACILITY INVESTIGATION
ROTTERDAM JUNCTION PLANT
Schenectady International Inc.

01308-62(160)GN-WA040 JAN 23/2001

Figure 4


MOHAWK RIVER
0 60 150ft
BH-134
OW33-92
BH-135
BH-133
BH-1
OW18-85
W18b-91
OW1-84
BH-132A
BH-6
OW11-84
BLDG 27
OW12b-84
OW12a-84
BH-5
AREA 41
BLDG 40
OW32-92
BH-136
BH-2
OW29-91
3-86
BLDG 11
-86
BLDG 22
COMPRESSOR BLDG. 22
BH-137
OW17-85
OW17b-91
BH-3A
OW2b-84
OW2a-84
OW16-85
LDG. 21
OW25-86
AGWAY BLDG.
OW26-86
OW28-91
BH-3
BLDG
BH-138
BLDG. 39
OW3-84
OW3a-91
BH-4
OW31-91
OW4b-84
LEGEND
PROPERTY BOUNDARY
OW16-85 MONITORING WELL LOCATION
BH-137 BOREHOLE LOCATION
TILE COLLECTION SYSTEM
GROUNDWATER DIVIDE
APPROXIMATE AREA IDENTIFIED WITH ELEVATED VOC PRESENCE BASED ON SOIL GAS AND BOREHOLE TESTING RESULTS OUTSIDE BARRIER WALL
APPROXIMATE AREA IDENTIFIED WITH ELEVATED VOC PRESENCE BASED ON SOIL GAS AND BOREHOLE TESTING RESULTS INSIDE BARRIER WALL
MAP REFERENCE: TOPOGRAPHIC SURVEY OF ROTTERDA I JUNCTION PROPERTY, SCHENECTADY INTERNATIONAL, INC. I ATED OCTOBER 4, 1994 PROVIDED BY C.T. MALE ASSOCIATES P.C.
CRA
1308 (PR) JULY 19/95(W) REV.0 (PR34)
AREAS OF CONTAMINATION
WEST OF GROUNDWATER DIVIDE
ROTTERDAM JUNCTION PLANT
Schenectady International Inc.

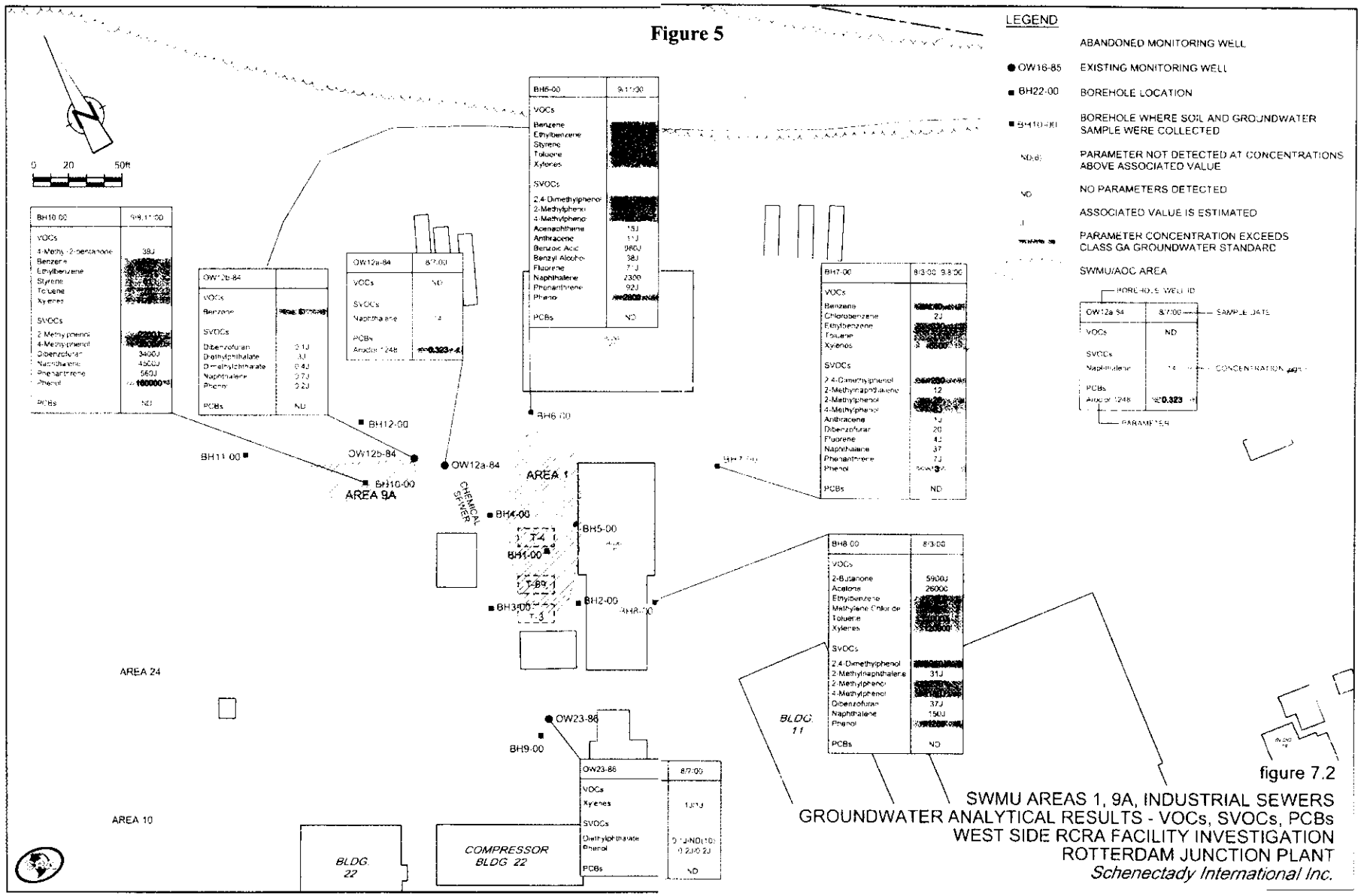
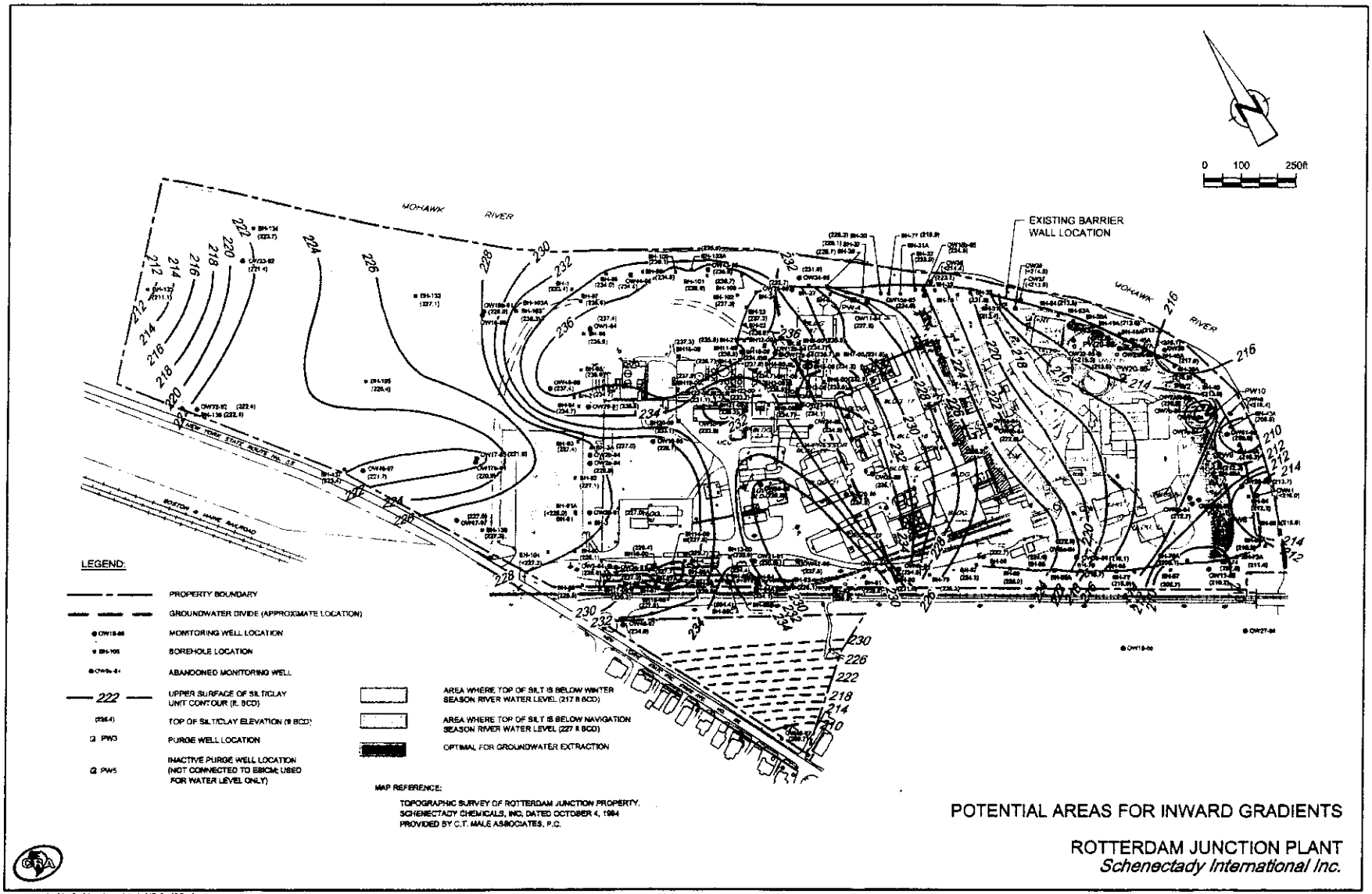


figure 7.2

SWMU AREAS 1, 9A, INDUSTRIAL SEWERS
GROUNDWATER ANALYTICAL RESULTS - VOCs, SVOCs, PCBs
WEST SIDE RCRA FACILITY INVESTIGATION
ROTTERDAM JUNCTION PLANT
Schenectady International Inc.

Figure 6



01308-28(178)GN-WA009 OCT 29/2002