NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

STATEMENT OF BASIS
FOR
KODAK PARK INVESTIGATION AREA MIA-308

FINAL
October 2006

FACILITY: **Eastman Kodak Company**
Kodak Park
ROCHESTER, NEW YORK
MONROE COUNTY

USEPA ID No.: NYD980592497
NYSDEC Permit Application No.: 8-2614-00205/00104-0
Inactive Hazardous Waste Disposal Site Code: 8-28-082

Introduction

The purpose of this Statement of Basis is to provide an opportunity for the public to be informed of and to participate in the selection of a final remedy that will be protective of human health and the environment for soils and groundwater contamination identified at the investigation area MIA-308 that is located near the east edge of Kodak Park Section M (KPM), in Rochester, New York (see Figure 1). The investigation area is comprised of a grouping of solid waste management units that were identified during the RCRA Facility Assessment. The grouping has been designated MIA-308.

This document:

- Provides a brief overview of the site history and site investigations which were conducted at MIA-308;
- Summarizes current and potential pathways of human exposure to contaminants in MIA-308;
- Describes the remedial goals that were considered; and
- Identifies the proposed remedy and presents the basis for its selection.

The New York State Department of Environmental Conservation (NYSDEC or Department), in consultation with the New York State Department of Health, has tentatively selected a proposed remedy. Changes to the proposed remedy, or the selection of an alternative remedy may be made if public comments or additional data indicate that such changes are warranted. The Department will finalize remedy selection for the facility after the public comment period has ended and the comments have been reviewed and considered.

This document summarizes information that can be found in greater detail at the document repositories identified below. The Department encourages the public to review the documents at the repositories to gain a more comprehensive understanding of the environmental investigations and related activities that have been undertaken for MIA-308, and the possible remedies to address that contamination.

Proposed Remedy

The Department has tentatively selected the remedy for MIA-308 described below. The proposed remedy consists of:

- continued operation and maintenance of existing MIA-308 passive hydraulic controls (sewers providing groundwater extraction);
- design and installation of source control measures (a groundwater extraction system) for groundwater contamination in the vicinity of Building 307 and Building 322 to reduce

concentrations in the contaminant mass and to prevent potential future migration of contaminants;

- disposal of the extracted groundwater in the Kodak Park industrial sewer system for treatment at Kodak's Kings Landing Wastewater treatment plant;

- continued groundwater monitoring in KPM , in accordance with the NYSDEC-approved Kodak Park Groundwater Sampling and Analysis Plan (KPGSAP)(Kodak, 1993) to assess the effectiveness of the remedy;

- administrative controls to address potential exposure to contaminated soils and groundwater. This includes continued implementation of existing institutional controls (i.e., site access restrictions) and adding deed restrictions to limit the future use and development of the property to commercial and industrial uses only . This will include a restriction preventing the future use of groundwater as a source of potable water. Volatile chemicals in MIA-308 groundwater can be a source for contaminated soil vapor, which can potentially affect indoor air quality in existing and future MIA-308 structures through the process of vapor intrusion. Due to the presence of volatile organic compounds in groundwater, the potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of existing structures on the site. It also includes an operation and maintenance plan specifying routine monitoring, maintenance, and reporting for soil cover systems for areas with soils concentrations above industrial/commercial (I/C) comparison values;

- continued implementation of the Kodak Park Master Plan II and project specific health and safety protocols for any future excavations within MIA-308 that may be necessary (e.g., to conduct routine maintenance activities); and,

- annual certification by the property owner that the institutional controls and engineering controls are in place and continue to be effective.

Facility Background

Since the late 1800's Kodak Park has been Eastman Kodak Company's primary photographic manufacturing facility. Primary current or historic operations at Kodak Park include the manufacture of film and paper base; preparation and coating of photographic emulsions; manufacture of electrophotographic toner; cutting, packaging and distribution of finished products; and the production of synthetic organic chemicals, dyes, and couplers.

The MIA-308 investigation area includes approximately 18 acres and is located in the eastern portion of KPM (Figure 1). MIA-308 is a subsection of KPM, a site listed on the New York State Department of Environmental Conservation Registry of Inactive Hazardous Waste Disposal Sites. MIA-308 included seven buildings. Buildings 307, 308, 309, 310 and 312 were a manufacturing complex recently vacated by Distillation Product Industries (DPI), a division of Eastman Chemical Company. This DPI complex was involved with production, packaging and

storage of vitamins and food supplements. Buildings 307 (B-307) and B-312 were demolished in 2004. Building 322 (B-322) is occupied by Kodak's Distilling Department. B-322 contains offices, computer systems, laboratories and electrical equipment. The B-322 area includes a large underground tank farm and distillation equipment. B-306, demolished in 1998, was used as a chemical testing laboratory.

In 1998, Kodak completed a RCRA Facility Assessment for Kodak Park. The assessment identified solid waste management units (SWMUs) subject to corrective action requirements. To administer corrective action, SWMUs were grouped into investigation areas, based on geographic and operational concerns. This statement of basis is for the SWMU grouping MIA-308. This grouping includes the 29 SWMUs listed in Table 1. The table also indicates the classification status (further action, no further action or sampling visit) of each SWMU, per the RCRA Facility Assessment Report. Figure 2 shows the location of the SWMUs in MIA-308.

The RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) for MIA-308 were completed in 2001 and 2004, respectively. In the CMS report Kodak reviewed site conditions and made recommendations for long-term care of MIA-308.

Facility Investigation Results

The RCRA Facility Investigation (RFI) for MIA-308 was completed in 2001. Subsurface investigations in MIA-308 have been conducted in a number of phases, between approximately 1990 and 2003. Investigations have focused on soils and groundwater. The field investigations were initially directed at the fence lines of KPM, and were implemented to determine if off-site contaminant migration was occurring in the overburden and upper bedrock. A subsurface investigation in the vicinity of B-322 was also conducted circa 1990, in response to an acetone spill at the site. Additional subsurface investigations were subsequently implemented to more fully assess groundwater conditions in the overburden and bedrock within the interior of KPM, where MIA-308 is located. A total of approximately 45 wells have been installed in and near the MIA-308 area.

The investigations identified a number subsurface zones that have contrasting hydrogeologic properties. In order of increasing depth, these include:

- Overburden - Unconsolidated materials, primarily glacially derived fine sands, silts, and clay, and miscellaneous fill material (including cinders, brick and wood). The water table occurs in this interval.

- Top-of-Rock (TOR) - The uppermost bedrock, typically moderately fractured sandstone/siltstone of variable thickness but generally on the order of 15-20 feet. The top-of-rock and overburden are collectively referred to as the upper flow zones. In MIA-308 the upper bedrock is generally more competent and less fractured than in sections of Kodak Park located to the east of KPM.

- Intermediate Grimsby - Sandstone/siltstone with relatively few fractures, exhibiting

generally low hydraulic conductivity. This unit functions as an aquitard and is not considered a flow zone for groundwater.

- Grimsby/Queenston (GQ) - Interval of moderately fractured (conductive) bedrock occurring within approximately 15 feet above or below the contact between the Grimsby Sandstone and the Queenston Shale. The GQ and the underlying Queenston are collectively referred to as the lower bedrock flow zones.

- Queenston Shale - Interbedded siltstones and shales with no discernible horizontal interval of elevated hydraulic conductivity. This zone was not investigated within MIA-308, but has been in some areas of Kodak Park located to the east.

Figure 3 is a cross-sectional view that shows the vertical relationship between these zones in the MIA-308 area.

Figures 4, 5, and 6 show the groundwater potentiometric surface and general flow directions for overburden, TOR, and GQ zones, respectively. For the overburden zone the horizontal component of groundwater flow is to the north. The geometric mean hydraulic conductivity is 9.68×10^{-5} cm/sec. The hydraulic conductivity for the overburden flow zone ranges from 4.1×10^{-7} cm/sec to 4.0×10^{-3} cm/sec.

For the TOR zone the horizontal component of groundwater flow is to the northwest. The geometric mean hydraulic conductivity is 4.31×10^{-6} cm/sec. The hydraulic conductivity for the TOR zone ranges from 3.33×10^{-7} cm/sec to 2.66×10^{-4} cm/sec.

For the GQ zone the horizontal component of groundwater flow is to the south. The geometric mean hydraulic conductivity is 8.20×10^{-6} cm/sec. The hydraulic conductivity for the GQ zone ranges from 1.15×10^{-6} cm/sec to 1.41×10^{-4} cm/sec.

Figure 3 shows the relationship between these flow zones. The vertical gradients are primarily downward, indicating a potential for groundwater flow downward. Slight upward gradients were noted in the northeast and northwest corners of the investigation area, near well clusters B314S and B308N. The steepest downward gradient was at the B310SW well cluster where a gradient of 0.30 feet/feet was reported.

During the RFI, groundwater flow simulations were performed using the Kodak Park Regional Groundwater Flow Model (RGFM). In response to NYSDEC comments on the RFI report, additional modeling and analysis was completed during the corrective measures study phase. The model was used to evaluate the net flux and fate of groundwater in the MIA-308 area. The RGFM also indicates that flow within the overburden and TOR zones is predominantly horizontal. The RGFM results are discussed further, in the groundwater section, below.

Soils

Soil characterization has been conducted for various reasons in MIA-308. In addition to soil

sampling specifically for the RFI, Kodak has tested soil during well installations, for tank and transfer station closures and upgrades, and for other routine site activities. The maximum total thickness of the soil is approximately 46 feet, but generally averages about 38 feet. Investigations have identified three types of unconsolidated deposits in MIA-308: imported fill, lacustrine deposits and glacial till. The fill, consisting of: sand, silt, gravel, mixed with cinders and miscellaneous materials (e.g., coal, brick and wood), is the uppermost deposit and ranges in thickness from 2 to 12 feet, with the maximum thickness near B-327. The lacustrine deposit overlies the bedrock and contains fine sand, with lesser proportions of silt and gravels. The lacustrine deposit is the major component of the three overburden materials. Glacial till is the minor component of the overburden deposits and consists of fine sand, silt and clay, with trace gravel. Basal tills appear to be absent in the investigation area, but isolated pockets of ablation till have been noted within the lacustrine deposits.

The soil quality data set includes approximately 140 samples collected from 106 locations within MIA-308 (see Figure A-4 for soil sample locations). These include results from soil boring and well installations, as well as results from soil piles and luggers (portable containers/roll-offs) generated during excavations for tank removals and other site maintenance activities. Soils data were screened against NYSDEC Technical Administrative Guidance Memorandum (TAGM) 3028 and TAGM 4046 comparison values. A tiered screening process was used to identify contaminants that may pose human health or ecological risks.

The table below summarizes volatile organic contaminants (VOCs), that exceeded one or more of the TAGM comparison values. The SWMU or group of SWMUs and building listed are those which may be associated with the exceedances based on proximity.

SWMU/SWMU Group	Building	TAGM 3028 and/or TAGM 4046 Exceedances
M-037	B-307	ethylbenzene, toluene, xylene
M-051	B-312	acetone
M-078/M-079	B-322	acetone, ethylbenzene, toluene, xylene
M-080	B-322	ethylbenzene, toluene, xylene, 4-methyl-2-pentanone
M-152	B-322	acetone, 1,2-dichloropropane, ethylbenzene, toluene, xylene, 4-methyl-2-pentanone, methylene chloride
M-162	B-322	acetone, benzene, 1,2-dichloroethane, 1,1-dichloroethylene, 1,2-dichloropropane, xylene, 4-methyl-2-pentanone, methylene chloride
M-171	B-307	acetone, methlene chloride, toluene
M-173	B-312	acetone

The table below summarizes semi-volatile organic contaminants (SVOCs), that exceeded one or

more of the TAGM comparison values. The SWMU or group of SWMUs and building listed are those which may be associated with the exceedances based on proximity.

SWMU/SWMU Group	Building	TAGM 3028 and/or TAGM 4046 Exceedances
M-051	B-312	benzo(a)anthracene, benzo(a)pyrene, chrysene, dimethylphthalate
M-078/M-079	B-322	4-chloro-3-methylphenol, 3,4-methylphenol
M-152	B-322	benzo(a)anthracene, benzo(a)pyrene, 2-chlorophenol, 3&4-methylphenol
M-162	B-322	anailine, benzo(a)pyrene, pentachlorophenol
M-171	B-307	benzo(a)anthracene, benzo(a)pyrene, chrysene, 2-methylphenol
M-173	B-312	benzo(a)pyrene

For the inorganic constituents, most locations had TAGM 4046 and/or TAGM 3028 exceedances for one or more metals, with exceedances being most common for arsenic, beryllium, iron and zinc. The levels of these metals in and around Kodak Park commonly exceed comparison values, and do not appear to be related to SWMUs within the investigation area. It appears that background concentrations in the area are often above the comparison values. Iron and zinc were also frequently detected above TAGM values, but are constituents typical of glacially derived soils in the area.

The table below summarizes exceedances of one or more of the TAGM comparison values for the other inorganic constituents. The SWMU or group of SWMUs and building listed are those which may be associated with the exceedances based on proximity.

SWMU/SWMU Group	Building	TAGM 3028 and/or TAGM 4046 Exceedances
M-035	B-307	cadmium
M-037	B-307	nickel
M-038	B-307	chromium, copper, nickel, selenium
M-039	B-307	nickel
M-040	B-307	chromium, copper, nickel
M-045	B-312	mercury
M-046	B-308	antimony, cadmium, chromium, copper, nickel

SWMU/SWMU Group	Building	TAGM 3028 and/or TAGM 4046 Exceedances
M-048	B-312	barium, cadmium, chromium, copper, nickel
M-049	B-312	chromium, copper, nickel
M-050	B-312	chromium
M-053	B-312	copper
M-076	B-322	chromium, copper, nickel
M-077	B-322	selenium
M-078/M-079	B-322	antimony, barium, chromium, copper, nickel
M-152	B-322	barium, chromium, copper, nickel
M-162	B-322	chromium, copper, nickel
M-171	B-307	chromium, copper, nickel
M-173	B-312	barium, chromium, nickel

The CMS report included a Screening Level Risk Assessment (SLRA) that evaluated the soils results against residential use criteria for the direct ingestion pathway, and also under a industrial/commercial (I/C) use scenario. In the SLRA, all soil samples were conservatively assumed to be surficial (from the upper 2 feet of the subsuface), regardless of the depth interval in which they were actually collected. For the residential use screening, concentrations were compared to TAGM 3028 soil action levels. The TAGM 3028 actions levels were calculated using a methodology consistent with the USEPA Soil Screening Guidance (USEPA, 1996a; USEPA 1996b; USEPA, 1996c). For the industrial/commercial (I/C) use scenario, exposure assumptions (e.g., duration) were adjusted in accordance with USEPA default values.

The SLRA identified 1,2-dichloropropane, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, arsenic, beryllium and zinc as exceeding residential use criteria. Arsenic values falling within the background range for the Eastern United States were removed from further consideration. After following these steps, only benzo(a)pyrene and arsenic exceeded the industrial/commercial screening values (for a listing of sample locations and exceedances, see Table 2). When existing cover conditions were assessed, all but four soil sample locations were located in areas containing protective cover, such as asphalt (for a listing of sample locations and exceedances, see Table 3) which precludes contact with soil contaminants. The sample with benzo(a)pyrene was collected between 4- 4.5 feet below ground surface so the soil will not be available for contact under current use conditions. The proposed remedy would minimize potential exposures to benzo(a)pyrene in subsurface soil through the continued implementation of Kodak's site management plan and site access restrictions. The sample with elevated arsenic (52 ppm) was from a pile of soil that was subsequently removed from the site and therefore does not present a potential for current or future exposures. The other two locations had arsenic at 15

to 19 ppm, concentrations only slightly above the typical background range. The proposed remedy would minimize potential exposures to arsenic in shallow subsurface soil through the continued implementation of Kodak's site management plan and site access restrictions.

To reduce potential future exposures to site soils, Kodak has recommended continued use of institutional controls to maintain current conditions through existing institutional controls and site operation and maintenance procedures. To limit potential exposure associated with subsurface excavations, Kodak has developed and implemented a soils excavation master plan. This plan imposes conditions, including health and safety provisions, that must be followed during the excavation and management of subsurface materials (soil) at the site.

The reasonably anticipated future use of MIA-308 is also industrial. MIA-308 is currently included as a portion of a site listed in the registry of *Inactive Hazardous Waste Disposal Sites in New York State* that is published by the NYSDEC as Site Code 8-28-082. The facility is also under a federal hazardous waste management facility permit, and has applied for a NYSDEC 6NYCRR Part 373 hazardous waste management facility permit. Due to these circumstances, use of MIA-308 for purposes other than industrial are not expected or likely. The proposed remedy will add deed restrictions to restrict future use of the MIA-308 area to industrial/commercial uses only.

Groundwater Flow

The region groundwater flow model (RGFM) was used to make quantitative estimates of groundwater flow in MIA-308 and to make groundwater fate determinations utilizing particle trace simulations. Water budget results generated by the model for the overburden, TOR and GQ zones are shown on figures 7, 8 and 9, respectively. The figures show the net flow of groundwater (in cubic feet per day (cfd)) across the lateral, upper and lower boundaries, and also flow into any groundwater capture device located within the investigation area boundaries.

Based on the flow simulations, the total net volumetric flow rate in the overburden in MIA-308 is about 6,169 cfd, or 32 gallons per minute (gpm). Of this total flux, 30% enters the flow system as surface recharge, 30% enters from adjacent areas (primarily from the south and east), and 40% enters from the TOR. As shown on Figure 7, 92% of the total net overburden flux is estimated to be removed by sewers within MIA-308. The RGFM estimates that 71% exits to industrial sewers, 6% exits to storm sewers and 6% exits equally to storm and industrial sewers (In some locations both types of sewers are closely spaced, at similar elevations within the same model cell, so the model cannot differentiate the discharge to each sewer. Based on similar positioning, approximately equal flow to each type of sewer was assumed.). The remainder of the total net overburden flux is projected to enter the B-308/309 pipe tunnel sump (1.1%), migrate down into the TOR (0.6%), or migrate laterally beyond MIA-308 (6.3%).

The total net volumetric flow rate in the TOR in MIA-308 estimated to be 2,714 cfd, or 14.1 gpm, of which 99.9% enters from adjacent areas, primarily the south and east (see Figure 8). The remainder enters from below. Of the total net flux, 92% is estimated to exit to the overburden, 6% exits laterally to the north and the west, and 2% exits to the pipe tunnel.

Estimated groundwater flux through the GQ zone in MIA-308 is very low, only 4 cfd (or 0.023 gpm). Most of this flow enters and exits the area laterally, but a small fraction of the flow enters from above and exits downward, into the underlying Queenston Shale (see Figure 9).

The RGFM was used to make groundwater fate determinations utilizing particle tracking. The model has the ability to track the fate and movement of particles that are "started" in particular positions and layers within the model. Results for the overburden, TOR and GQ zones are shown on Figures 10, 11, and 12, respectively. According to RGFM simulations, flow within the GQ zone is very slow, so particles are not projected to move any significant distance from the investigation area, even after an extended period of time. The results indicate that groundwater in these two zones is expected to discharge to the following:

- industrial and storm sewers within MIA-308;
- sewers within KPM in aggregate;
- the pipe tunnel between B-308 and B-309; and
- the Northen KPM Migration Control System (MCS).

Groundwater Quality

Figure 13 shows the distribution of organic contaminants that exceed groundwater quality comparison values in MIA-333. The comparison values were from TAGM 3028 and/or NYSDEC Technical and Operational Guidance Series 1.1.1 (TOGS).

In the overburden, for the most recent sampling results, there were exceedances for twelve volatile organic compounds (VOCs): acetone; benzene; 1,1-dichloroethylene; 1,2-dichloroethylene (total); ethylbenzene; ethylene glycol; hexane; methylene chloride; toluene; trichloroethylene; vinyl chloride; and, xylene. Figure 13 shows that detections have primarily been in the central and northwest portions of MIA-308, with fewer detections and lower concentrations to the north, northeast and southeast. Isopropyl ether was a significant contaminant reported in the Total VOC (TVOC) concentrations shown on the figure. Four semi-volatile organic compounds (SVOC) exceeded comparison values: bis(2-ethylhexyl)phthalate; 1,4-dioxane; 2-methylphenol; and 3-&4-methylphenol. These exceedances occurred in 3 of the 27 overburden wells. There were exceedances for fourteen inorganic constituents in the overburden. Four constituents (sodium, iron, magnesium, and manganese) had exceedances in the majority of the wells that were sampled. Specific details are summarized in Table 1 of the CMS Report (Golder, 2004). The inorganic exceedances were distributed more broadly than the organic constituents, and generally do not appear to be related to operation of SWMUs.

In the TOR, for the most recent sampling results, there were exceedances for fifteen VOCs: acetone; benzene; 1,1-dichloroethylene; 1,1-dichloroethane; 1,2-dichloroethylene (total); 1,2-dichloropropane; ethylbenzene; chloroethane; chlorobenzene; methanol; methylene chloride; toluene; trichloroethylene; vinyl chloride; and, xylene. Although there is no TAGM value for isopropyl ether, this compound was detected at elevated concentrations at wells G1B314S, GB322NE2, GB322SW, and GBM41SW. Eight SVOCs exceeded comparison values: bis(2-ethylhexyl)phthalate; 1,4-dioxane; 3-&4-methylphenol; p-chloroanaline; 2,4-dimethylphenol; 4-

nitrophenol; formadehyde; and, phenol. Several of the exceedances were at low, estimated ("J" flagged) concentrations. The SVOC most commonly detected above screening values was bis(2-ethylhexyl)phthalate. There were exceedances for eleven inorganic constituents in the overburden. Iron and sodium were most frequently detected above TAGM values.

In the GQ zone, for VOCs, acetonitrile was detected above TAGM levels in well GQB308E. Although there is no TAGM value for isopropyl ether, this compound was detected at elevated concentrations in the same well. No SVOCs were detected above TAGM levels.

During the RFI and as part of the CMS, groundwater data was evaluated against criteria commonly used to screen for the likely presence of Non-Aqueous Phase Liquid (NAPL) (USEPA, 1992). Those evaluations indicated that there is the potential for current and/or historical NAPL in MIA-308. For the VOCs, isopropyl ether, toluene and xylene were identified as potential NAPL constituents. Screening results are provided in Table 4, and areas of potential NAPL are shown on Figure 14. NAPL has not been directly observed in monitoring wells in MIA-308.

Based on the flow simulations from the RGFM, migration of dissolve-phase contaminants within MIA-308 is controlled primarily by recharge/infiltration in the area and discharge to the industrial sewers, B-308/309 pipe tunnel, and to a lesser degree, storm sewers. These discharge features capture groundwater and have served to limit the migration of contaminants from the area. The spatial distribution of contaminants in MIA-308 supports a largely horizontal flow regime with sewers as the dominant drainage mechanism for the overburden and TOR. This is also consistent with the groundwater budget modeling and groundwater fate determinations.

Comparison values used for screening groundwater quality data for MIA-308 are values designed for the protection of drinking water quality. However, groundwater at and in the vicinity of MIA-308 is not used as a drinking water source, due to availability of publicly supplied water. Therefore, presently there is no complete direct ingestion exposure pathway associated with the groundwater exceedances. Volatile chemical contaminants in MIA-308 groundwater can be a source for contaminated soil vapor, which can potentially affect indoor air quality in existing and future MIA-308 through the process of vapor intrusion. Due to the presence of volatile organic compounds in groundwater, the potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of existing structures on the site.

Remedial Goals

The remedial goals for MIA-308 are to eliminate or reduce to the extent practicable:

- exposures to subsurface soil contaminants identified above by utilizing the soils management plan (Excavation Master Plan II) for excavation activities conducted in MIA-308.

- exposures to groundwater contaminants (see Figure 13 and Table 4) by controlling

migration of contaminated groundwater. This will include installation and operation of groundwater extraction system targeting the potential NAPL areas, mitigating a potential on-going source of groundwater contamination.

- exposures to groundwater by restricting future use of groundwater as a source of potable water; and

- exposures to the constituents in soil and groundwater through the maintenance of existing institutional controls and through implementation of deed/land use restrictions to limit future use to industrial/commercial activities.

Further, the remedial goals for MIA-308 include attaining to the extent practicable:

- Reduction of the contaminant mass in the subsurface. The long-term remedial goal is the restoration of groundwater quality in this area to New York State Ambient Water Quality Criteria. This will require that the remedy remain in operation until such time as Kodak can demonstrate that any residual contamination will not result in an exceedance of New York State Ambient Water Quality Criteria at the point of exposure. The Department will seek public comment prior to making a determination regarding termination of operation of the active groundwater recovery measures that are a component of the remedy.

Identification of Remedial Alternatives

A number of remedial technology screening studies have been completed for Kodak Park. These have include the KPW Distilling/Southwest Area Feasibility Study Report (Eckenfelder, 1992), a Pre-Investigation Evaluation of Corrective Measures Technologies (Eastman Kodak 1994), and the NE-KPE RCRA Corrective Measures Study (SSP&A, 1999). These studies included contaminant release scenarios similar to that present in MIA-308, so they have applicability. For the soils, technologies that were considered included: soil excavation and disposal, biological treatment, soil vapor extraction, chemical enhanced recovery, containment (low permeability cover, geosynthetic cap, paving/asphalt cover), and institutional controls.

For the groundwater, technologies that were considered included: extraction (with various enhancements such as hydrofracturing, pneumatic fracturing, and blasting), treatment after removal (air/steam stripping, thermal oxidation, carbon adsorption, oil/water separation, phase separation, UV peroxide/ozone oxidation, on-site biological treatment; and discharge to the existing wastewater treatment facility (Kings Landing). In-situ treatment options for the groundwater were also presented in the CMS report. In-situ technologies were not retained for further consideration for current conditions generally because of the presence of NAPL, which can limit effectiveness, and/or access limitations due to infrastructure present in the area of concern.

As a consequence, in the CMS report, the following groundwater remedial technologies were selected for additional consideration:

- groundwater containment provided by existing containment systems in and adjacent to MIA-308;
- engineered groundwater extraction system for selected areas and flow zones of MIA-308, with discharge to industrial sewers leading to Kings Landing; and
- institutional controls.

Two remedial alternatives were developed for detailed evaluation. These are:

- Alternative 1 - Maintain Existing Hydraulic Control/Institutional Controls of Soils and Groundwater

This alternative relies on existing systems in and proximate to MIA-308 to provide hydraulic control, capture of contaminated groundwater and reduce the potential for off-site migration of contaminants. Intercepted groundwater under this scenario is discharged to Kings Landing and, to a lesser degree, to storm sewers (monitored as part of the previously selected XIA-218 remedy). Continued implementation of existing institutional controls, supplemented with deed/land use restrictions in the investigation area would also be required. This would include continued implementation of the Kodak Park excavation and health and safety protocols for soil management activities.

- Alternative 2 - Hydraulic Control and Contaminant Mass Removal Using Groundwater Extraction/Institutional Controls of Soils and Groundwater

This alternative includes all of the components identified for Alternative 1 plus the installation of a groundwater extraction system for the removal of contaminant mass from the northwestern and central portions of MIA-308 where the highest groundwater contaminant concentrations have been historically found, and where zone of potential NAPL have been inferred. Within the CMS report, an extraction system using conventional pumping wells was considered. Three of the pumping wells would be installed in the overburden. Two wells would be located to address an area east of B-307 that contains a potential NAPL area of toluene and an area north of B-307 that contains elevated levels of chlorinated organic compounds and is hydraulically downgradient of the area east of B-307. The other overburden well would be located north of B-322. A pumping well would also be screened in the overburden and top-of-rock zones, and located to address the area northeast of B-322, that contains a potential NAPL area of isopropyl ether. Based on the groundwater flow modeling, a projected flow of about 12 gpm was estimated for the total system. Figures 15 and 16 show the projected capture areas for Alternative 2 for the overburden and TOR zones, respectively. Extracted groundwater would be discharged to the industrial sewer for treatment at Kings Landing.

Evaluation of Remedial Alternatives

The following criteria were used to evaluate the identified alternatives:

- technical
- environmental

- human health
- institutional
- reduction of toxicity, mobility, or volume
- cost
- community acceptance

Both alternatives rely on technologies that are routinely implemented, so there are no technical impediments related to their use. There is a higher degree of uncertainty associated with the projected groundwater flowpaths for Alternative 1 than for Alternative 2. Alternative 2 provides greater certainty that contaminant migration from MIA-308 would be controlled and treated prior to discharge to surface water. Although Alternative 1 allows a fraction of the contaminated groundwater to discharge to the storm sewers, this alternative appears to be protective of the environment, based on available monitoring results. Alternative 2 is also protective of the environment, as it includes the elements of Alternative 1, but has supplemental extraction and greater certainty of groundwater containment. Alternative 2 provides a higher degree of contaminant mass reduction than Alternative 1, and it also reduces potential contaminated groundwater discharge to the storm sewers.

For human health, both alternatives were considered protective in the Screening Level Risk Assessment included in the CMS report. Plausible exposure pathways were considered to be incomplete, or managed by existing institutional or administrative controls, or eliminated based on groundwater flow modeling. Alternative 2 provides a greater degree of certainty that the plausible groundwater exposure pathways will be eliminated, as potentially NAPL-impacted groundwater is targeted for extraction and treatment. The institutional aspects of the land use and groundwater use restrictions for both alternatives are similar. A NYSDEC-approved corrective measures implementation plan will be needed for the design of the groundwater extraction system for Alternative 2. Alternative 1 is not expected to provide any significant reduction of toxicity, mobility or volume. However, Alternative 2 provides for reduction of contaminant mass in the potential NAPL areas, and provides great certainty that contaminant migration will be effectively contained.

On a cost basis, Alternative 1 has an estimated 30 year present value cost of about $227,000. Alternative 2 has an estimated 30 year cost of about $1,159,000, assuming the groundwater extraction system operates for the duration of that period.

Proposed Corrective Measures

Based on the analysis of alternatives, Alternative 2 - Hydraulic Control and Contaminant Mass Removal Using Groundwater Extraction/Institutional Controls of Soils and Groundwater - is the proposed corrective measures alternative for MIA-308. Alternative 2 includes the following elements:

- continued operation and maintenance of existing MIA-308 passive hydraulic controls (sewers providing groundwater extraction);

- design and installation of source control measures (a groundwater extraction system) for groundwater contamination in the vicinity of Building 307 and Building 322 to reduce concentrations contaminant mass and potential future migration of contaminants;

- disposal of the extracted groundwater in the Kodak Park industrial sewer system for treatment at Kodak's Kings Landing wastewater treatment plant;

- continued groundwater monitoring in KPM , in accordance with the NYSDEC-approved Kodak Park Groundwater Sampling and Analysis Plan (KPGSAP)(Kodak, 1993) to assess the effectiveness of the remedy;

- administrative controls to address potential exposure to contaminated soils and groundwater. This includes continued implementation of existing institutional controls (i.e., site access restrictions) and adding deed restrictions to limit the future use and development of the property to commercial and industrial uses only This will include a restriction preventing the future use of groundwater as a source of potable water. Volatile chemicals in MIA-308 groundwater can be a source for contaminated soil vapor, which can potentially affect indoor air quality in existing and future MIA-308 structures through the process of vapor intrusion. Due to the presence of volatile organic compounds in groundwater, the potential for vapor intrusion to indoor air must be evaluated prior to any new construction or change in use of existing structures on the site. It also includes an operation and maintenance plan specifying routine monitoring, maintenance, and reporting for soil cover systems for areas with soils concentrations above industrial/commercial (I/C) comparison values;

- continued implementation of the Kodak Park Master Plan II and project specific health and safety protocols for any future excavations within MIA-308 that may be necessary (e.g., to conduct routine maintenance activities); and,

- annual certification by the property owner that the institutional controls and engineering controls are in place and continue to be effective.

Under the remedy, the property owner would be required to provide an annual certification that the institutional controls and engineering controls are in place and remain effective. This will require at least annual inspections. The intent is to ensure that no unauthorized changes have occurred since the previous certification and nothing has occurred that would impair the ability of the controls to protect public health or the environment. This would also include verifying that administrative controls such as the soils management plan (Excavation Master Plan II) are being followed.

The CMS report and related environmental investigation reports are available for review at the NYSDEC Region 8 office located in Avon and at the Kodak Park Neighborhood Information Center located in Rochester. The NYSDEC has determined that the proposed remedy satisfies the selection criteria and recommends that this remedy be implemented as the final corrective measure for MIA-308. The proposed remedy adequately addresses potential threats to the

environment and human health, associated with MIA-308.

Corrective Measures Implementation

With the exception of deed restrictions, groundwater extraction system and the annual certification requirements, the elements that comprise the proposed corrective measures are being implemented as part of Kodak's current operational practices. Upon finalization of remedy selection for MIA-308, Kodak shall within 45 days submit a corrective measures implementation plan. Within 180 days of remedy selection, Kodak shall also implement the deed restrictions noted above.

Public Participation

NYSDEC solicits public comment before making final determinations about selection of remedies. The NYSDEC issues responsiveness summaries if comments are received during the comment period. Documents about the proposed remedy selection have also been placed in local document repositories. Copies of this Statement of Basis, the Fact Sheet, the RFI Report, the CMS Report were made available for public review.

REFERENCES

Blasland, Bouck & Lee, 1990. Report of Building 322 Acetone Release Investigation.

Blasland, Bouck & Lee, 1991. Report on KPM East Fenceline Goundwater Investigation.

Blasland, Bouck & Lee, 1992. Report on Preliminary Site Assessment KPM Order on Consent (Index #B8-0190-91-04)

Eastman Kodak Company, 1993. Kodak Park Groundwater Sampling and Analysis Plan, Rochester, New York, Revised 2002.

Eastman Kodak Company, 1994. RCRA Facility Investigation, Pre-Investigation Evaluation of Corrective Measures Technologies, Kodak Park, Rochester, New York, June 1994.

Eastman Kodak Company, 1996a. Kodak Park Corrective Action Program, Investigation Area MIA-308 East Fenceline Supplemental Off-Site Investigation Report.

Eastman Kodak Company, 1996b. Excavation Management Plan II, Kodak Park Facility, Eastman Kodak Company, Rochester, New York, Revised June 1999.

Eastman Kodak Company, 1998. Part E, Corrective Requirements, 6NYCRR Part 373 Permit Application for Eastman Kodak Company, Kodak Park Facility, revised March 1998.

Eastman Kodak Company, 1998. RCRA Facility Assessment for the Kodak Park Facility, Eastman Kodak Company, Rochester, New York.

Eckenfelder, 1992. Feasibility Study, KPW Distilling and Southwest KPW Areas, Kodak Park West, Rochetser, New York. Report prepared for Eastman Kodak Company.

Golder Associates Inc., 2001. MIA-308 RCRA Facility Investigation Report, Kodak Park Corrective Action Program, Eastman Kodak Company, June 2001.

Golder Associates Inc., 2003. MIA-308 RCRA Facility Investigation Report Addendum, Groundwater Flow and Transport Investigation for Sewer Capture Analysis, March 2003.

Golder Associates Inc., 2004. MIA-308 Corrective Measures Study Report, Kodak Park Corrective Action Program, Eastman Kodak Company, May 2004.

New York State Department of Environmental Conservation, 1994. HWR-94-4046, Technical and Administrative Guidance Memorandum 4046, Determination of Soil Cleanup Objectives and Cleanup Levels.

New York State Department of Environmental Conservation, 1997. Technical Administrative Guidance Memorandum 3028, "Contained-in Criteria for Environmental Media", November 30,

1992, Revised March 14, 1997.

New York State Department of Environmental Conservation, 1998. Division of Water Technical Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards, Guidance Values and Groundwater Effluent Limitations, October 22, 1993, Revised June 1998.

S.S. Papadopulos & Associates, Inc. (SSP&A), 1994a, Regional Simulation of Ground-Water Flow Conditions, Kodak Park Area, Rochester, New York: March 1994.

S.S. Papadopulos & Associates, Inc. (SSP&A), 1996, Corrective Measures Study - Investigatioin Area WIA-KPW (Kodak Park Study Area No. 1), Kodak Park Facility, Rochester, New York: February 1996.

S.S. Papadopulos & Associates, Inc. (SSP&A), 1999, NE-KPE RCRA Corrective Measure Study - Kodak Park Corrective Action Program, Kodak Park Facility, Rochester, New York: May 1999.

United States Environmental Protection Agency, 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual [Part A] Interim Final. Office of Solid Waste and Emergency Response, Washington, DC.

United States Environmental Protection Agency, 1991. Human Health Evaluation Manual, Supplemental Guidance: “Standard Default Exposure Factors”. Office of Solid Waste and Emergency Response, Washington, DC.

United States Environmental Protection Agency, 1992. Estimates Potential for Occurrence of DNAPL at Superfund Sites. Office of Emergency and Remedial Response, Washington, DC, January 1992.

United States Environmental Protection Agency, 1994. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities: Office of Emergency Response, Washington, DC. EPA/540/F-94/043.

United States Environmental Protection Agency, 1996. Soil Screening Guidance, Office of Solid Waste and Emergency Response, Washington, DC., 1996.

United States Environmental Protection Agency, 1997a. Health Effects Assessment Summary Tables (HEAST). Annual Update, FY 1997. National Center for Environmental Assessment, Office of Research and Development, Office of Solid Waste and Emergency Response, Washington, DC.

United States Environmental Protection Agency, 1997b. Exposure Factors Handbook. Revised 1997. National Center for Environmental Assessment, Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC.

United States Environmental Protection Agency, 1999. Integrated Risk Information System (IRIS). Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH. Internet database (http://www.epa.gov/iris).

United States Environmental Protection Agency, 2002. Handbook of Groundwater Protection and Cleanup Poloicies for RCRA Corrective Action, Office of Solid Waste and Emergency Response, Washington, DC, September 2002. file: lmt\kpm\MIA-308\MIA-308 draft statement of basis 2-06.wpd