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New York State Department of Environmental Conservation
Region 8 Office - Regulatory Services
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Telephone: 716-226-2466 Fax: 716-226-2830

Michael D. Zagata
Commissioner

Renée Forgensi Davison
Regional Director

June 24, 1996

Mr. David Cushman
Kodak Park Corrective Action Program Manager
Groundwater Quality Section
Kodak Park Health, Safety and Environment
Eastman Kodak Company
B326, 2nd. Flr., Room 2770
1669 Lake Avenue
Rochester, NY 14652-5135

JUN 27 1996

Dear Mr. Cushman:

Re: Corrective Measures Study (CMS)
Investigation Area WIA-KPW, Kodak Park
Study Area No. 1 - Rochester, New York

We have reviewed your February 29, 1996 response to our January 16, 1996 comments on the CMS report. The revised pages that you provided for the report are acceptable. The October 1995 CMS report, as modified by the revised pages included in your February 29, 1996 submission, is approved. As you may be aware, the public must be given an opportunity to review and comment on the remedy selection process. The Department has prepared a Fact Sheet, a Statement of Basis, and a Technical Impracticability Evaluation supporting tentative selection of the remedial alternative that was recommended in the CMS report. These documents are enclosed. The Department will announce the tentative remedy selection in the Environmental Notices Bulletin that will be published on July 3, 1996. Kodak needs to public notice the enclosed Fact Sheet in the Rochester Democrat & Chronicle, once during the week July 1 through July 5 1996 . A 60 day comment period will be used. The comment period will end on September 3, 1996. A public hearing will be scheduled if warranted based on comments received. Although the final remedy may differ from the one that has been tentatively identified, we recommend that Kodak begin preparing a corrective measures implementation plan.

We do not agree with all aspects of your rationale provided in your February 29, 1996 response to Comment 11. We maintain that there are situations where the maximum contaminant concentration at a specific monitoring point is an appropriate means of assessing exposure potential. In particular, where a monitoring system has limited spatial and temporal information, it becomes even more critical that spatially and temporally discrete sampling results are used in assessing exposure potential. In the particular instance at KPW, Kodak has proposed a remedy that should eliminate shallow off-site groundwater flow into the nearby residential area, eliminating any possibility of future exposure to such a resident. For this reason, we are not requiring a revision of the exposure scenario assessment.

If you have any questions, please contact Mr. Larry Thomas at (518)457-9253, or Mr. Bart Putzig at (716)226-2466.

Sincerely,

Peter A. Lent

Peter A. Lent
Deputy Regional Permit Adminsitrator
Division of Compliance Services

Enclosures

cc: E. Dassatti, DEC Albany
P. Counterman, DEC Albany
A. Bellina, EPA Region II
T. Marriott, DEC Region 8
E. Miles , DEC Albany
J. Cloonan
D. Coyne
R. Elliott
D. Napier
C. Ziarko
City of Rochester
D. Duford, Rochester School District

file: 2-96cms.kpw

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NOTICE OF PUBLIC COMMENT PERIOD
NOTICE OF PROPOSED REMEDY TO ADDRESS SITE CONTAMINATION

DEC Order-On-Consent Index #B8-0190-88-04

Date: July 3, 1996

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the Corrective Measures Study for WIA-KPW (Kodak Park Study Area No. 1) submitted by:

Eastman Kodak Company
Kodak Park Health Safety and Environment Services
Groundwater Quality Section
Rochester, New York 14652-3615

and has made a tentative selection of a final remedy to address site contamination at WIA-KPW.

The Statement of Basis for the tentatively selected remedy is available for public review and comment until September 3, 1996.

PROJECT SUMMARY AND LOCATION

Since the early 1900's, Eastman Kodak has operated chemical storage, transfer, distillation and manufacturing operations in Kodak Park Section W (KPW-77 acres), and an adjacent portion of Kodak Park Section E (KPE-westernmost 7 acres). Collectively, this area is identified as WIA-KPW and is also referred to as Kodak Park Study Area No. 1, and is located in the city of Rochester, Monroe County. In 1988, Eastman Kodak signed an Order on Consent with the NYSDEC, agreeing to investigate and remediate releases to the environment associated with operations in this area. Kodak has investigated conditions in the area and has evaluated remedial alternatives for the site. The DEC has reviewed the alternatives, identified a recommended alternative, and is now requesting public comment before selecting a final remedy to address site contamination.

TENTATIVE DETERMINATION

After review of numerous environmental investigation reports and the Corrective Measures Study for WIA-KPW, the Department has made a tentative determination to select the alternative identified as #4 in the Final CMS report. This alternative involves:

- containment of upper overburden/bedrock groundwater using both active (pumping wells) and passive collection systems.

- active recovery of deep bedrock groundwater in highly contaminated areas, with passive collection in less contaminated areas.

- treatment of water at Kodak's existing waste water treatment plant.
- isolating site soil with elevated contaminant levels through capping or access restrictions.
- institutional controls (property deed and access restrictions) on future use of site groundwater and soil.
- monitoring and periodic evaluation of the effectiveness of the alternative.

These actions constitute the proposed final corrective action remedy.

Pursuant to Part 617 of the New York State regulations for Article 8 [the State Environmental Quality Review Act (SEQR)], NYSDEC has determined that the proposed action, described above, constitutes maintenance of an existing facility and, therefore, is an exempt action. (Such actions by definition are not subject to SEQR determinations of environmental significance.)

DOCUMENT AVAILABILITY

Copies of the Statement of Basis and related supporting documents are available for inspection at the:

New York State
Dept. of Environmental Conservation
Region 8 Regulatory Services
6274 East Avon Lima Road
Avon, New York 14414
Contact Person: Peter Lent
Telephone: 716/226-2466

New York State
Dept. of Environmental Conservation
Bureau of Hazardous Compliance &
Land Management
50 Wolf Road-Room 460
Albany, New York 12233-7252
Contact Person: Larry Thomas
Telephone: 518/457-9253

and

Rochester Public Library
Maplewood Branch
1111 Dewey Avenue
Rochester, New York 14613
Telephone: 716/254-7048

Kodak Park Neighborhood Information Center
200 West Ridge Road
Rochester, New York 14652-3211
Telephone: 716/722-1707

A copy of the Statement of Basis, which summarizes the remedy selection process, may be obtained by contacting the aforementioned Department staff located in Albany and Avon.

HOW TO PROVIDE YOUR COMMENTS

All comments will be considered in making the final decision concerning selection of the remedy. A response to any comments submitted will be issued which will identify any changes to the proposed remedy and will describe and respond to the issues raised. A notice of the decision will be sent to each person who submits written comments or who requests such notice. Comments about this section must be sent to the above-listed contact person at the NYSDEC Region 8 Office. In lieu of or in addition to the submission of comments as provided above, any

interested persons may request a public hearing.

All comments and/or requests for a public hearing must be submitted in writing no later than September 3, 1996.

Statement of Basis for Remedy Selection
Investigation Area WIA-KPW - Study Area No. 1
Kodak Park
Rochester, New York

JUN 27 1996

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 from the groundwater and soil contamination that has been observed at WIA-KPW, in Kodak Park, located in Rochester, New York.

This document:

- Provides a brief overview of site history and environmental investigations that have been completed at this site;
- Identifies risks to human health and the environment posed by contamination at this site;
- Describes remedial goals and identifies the proposed remedy;
- Describes other remedies that were considered and the rationale for selecting the proposed remedy;
- Solicits public review and comment on the proposed remedy and other plausible remedies; and,
- Provides information on how the public can become involved in selecting the remedy for this site.

The New York State Department of Environmental Conservation (Department) has tentatively selected a proposed remedy for this site. The public is encouraged to comment on the remedy selection process for this site. The proposed remedy is only an initial recommendation. Changes to the proposed remedy, or a change from the proposed remedy to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate solution. The Department will select a final remedy for the site after the public comment period has ended and comments have been reviewed and considered. The Department has set a public comment period from July 3, 1996 to September 3, 1996.

This document summarizes information that can be found in greater detail in the administrative record for the site. The record includes a report prepared for Kodak by S.S. Papadopulos, entitled, "*Corrective Measures Study for Investigation Area WIA-KPW - Study Area No. 1.*" The corrective measures study (CMS) report presents a detailed evaluation of potential remedies for this site.

Facility Background

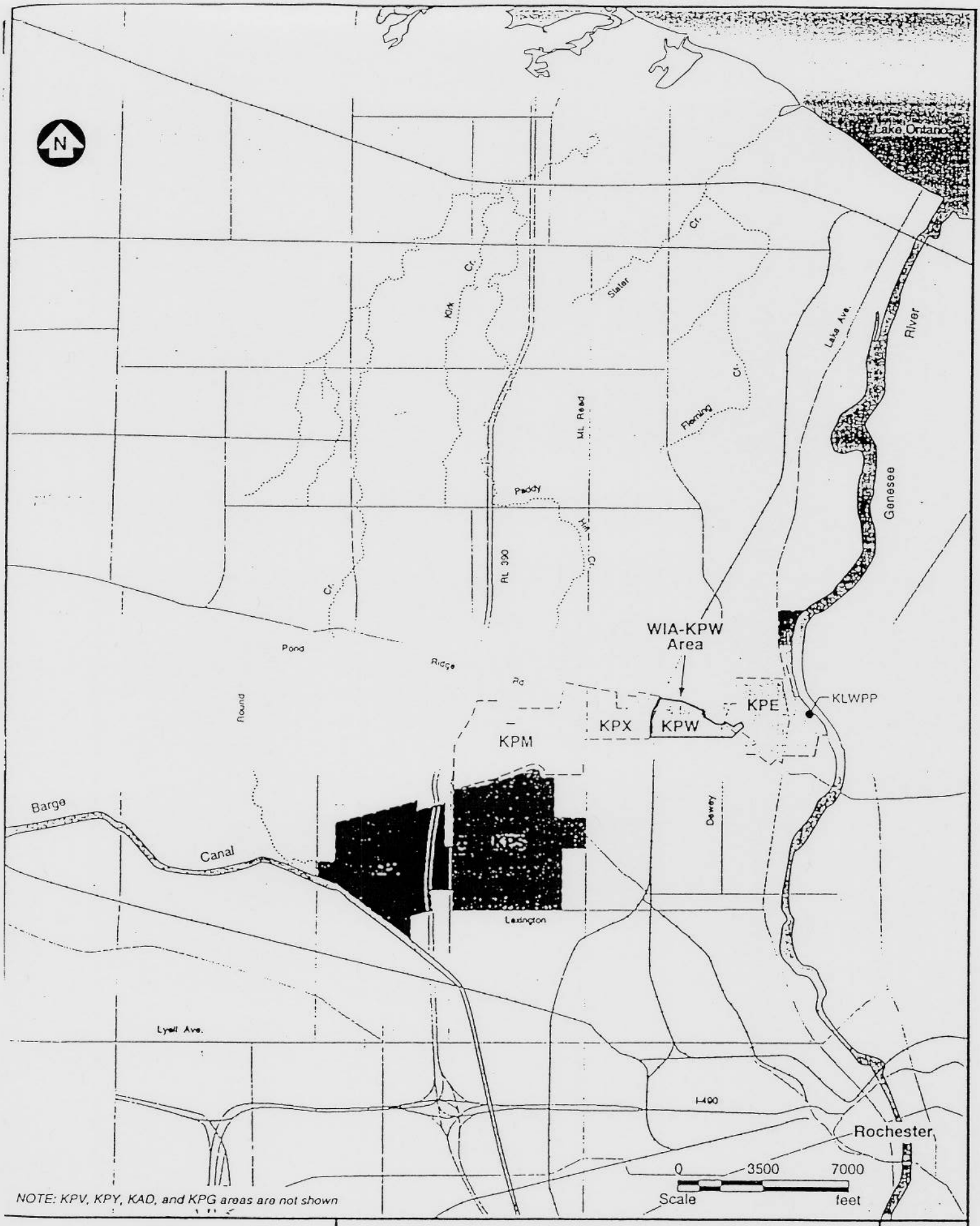
The Kodak Park facility of the Eastman Kodak Company (Kodak) are located in Monroe County, in Rochester, New York and cover an area of approximately 2,000 acres. Kodak Park is comprised of six major sections: KPE, KPW, KPX, KPM, KPS and KPT (see Figure 1 for locations). Park section KPW and a small part of KPE adjacent to KPW have been designated as environmental investigation area WIA-KPW. In 1988, Kodak signed an Order On Consent (#B8-0190-88-04) with the Department requiring the investigation, evaluation of potential remedies, and the implementation of a remedy for WIA-KPW and any surrounding areas affected by releases from WIA-KPW. The Order is currently in effect, but at some point in the future, it may be replaced by a 6NYCRR Part 373 Hazardous Waste Management Permit issued by the NYSDEC.

Environmental investigation area WIA-KPW, occupies approximately 84 acres of Kodak Park, and includes the entirety of KPW (77 acres) and a 7-acre area in the western part of KPE, as shown on Figures 1 and 2. WIA-KPW is bounded on the north and south by residential and commercial properties, and to the west by Conrail and Southern railroad tracks. The study area for the CMS includes an unbounded area to the south of WIA-KPW occupied by residential and commercial properties.

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

Development of KPE started in 1891. Currently there are 80 buildings on KPE, of which three are included in the WIA-KPW investigation area (buildings B-69, B-65, and B-67). These buildings are used as chemical analytical laboratories and offices with services related to electrical and photographic development and chemical processing. Development of KPW began in the early 1900's. KPW is the second largest production area in Kodak Park, and it currently includes approximately 40 buildings. Primary operations in KPW include manufacture, distillation, storage, and transfer of chemicals. Solvents used in the manufacture of film are stored in KPW and are sent to film-manufacturing areas within KPE through a system of solvent pipelines. Six major divisions of Eastman Kodak Company are present in KPW, including the Distilling Department, Synthetic Chemicals Division, Eastman Fine Chemicals Division, Silver Recovery Department, Plastic and Metal Products Division, and the Utilities Division.

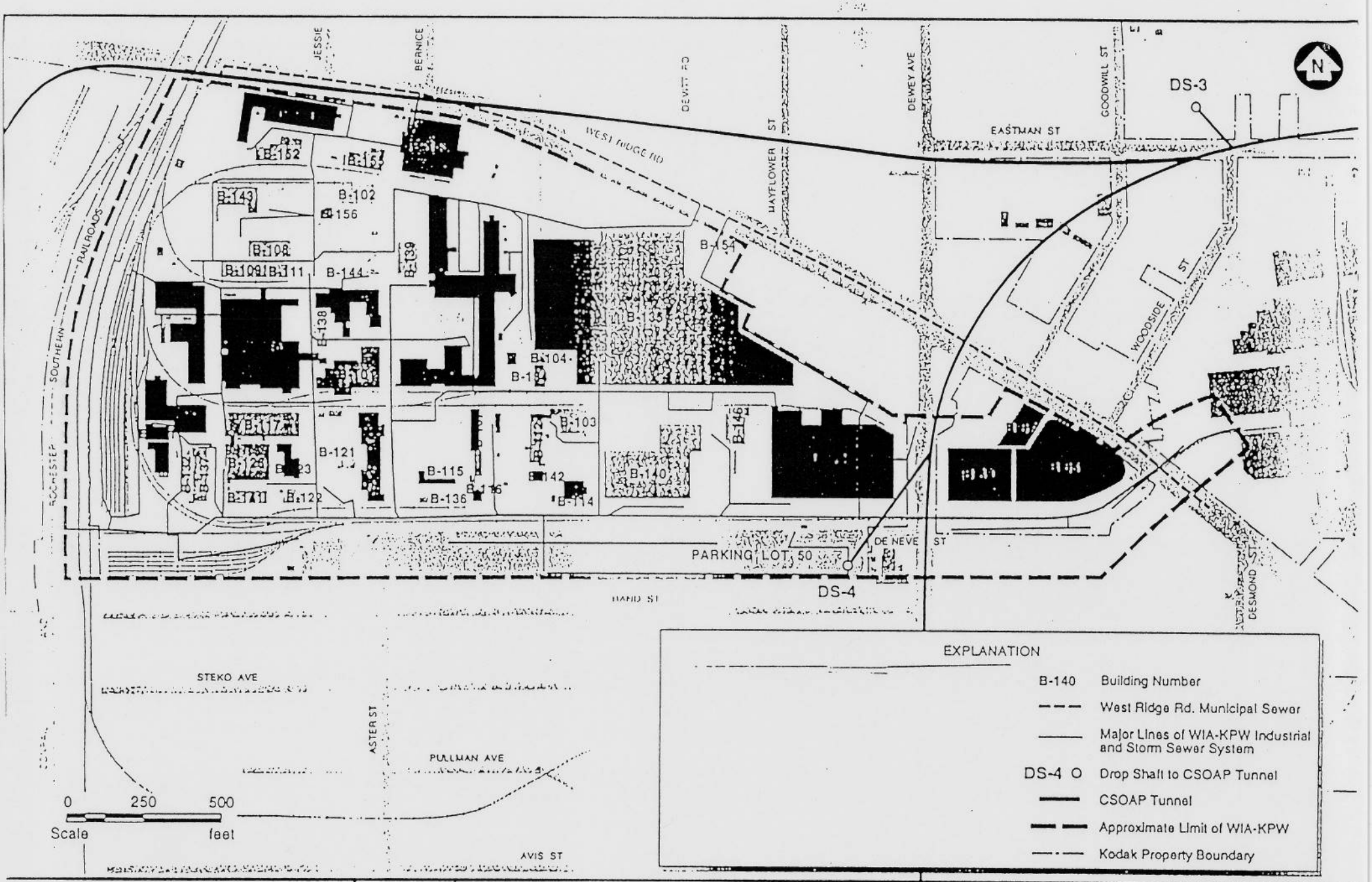
Wastewater from operations in WIA-KPW is discharged to an industrial sewer system that goes to Kodak's wastewater treatment facility, Kings Landing Wastewater Purification Plant (KLWPP), located next to the Genessee River in KPE, as shown on Figure 1. The main industrial sewer line in KPW is 48 inches in diameter. The industrial sewer was installed in 1919



S.S. PAPADOPULOS & ASSOCIATES, INC.
ENVIRONMENTAL & WATER RESOURCE CONSULTANTS

LOCATION OF KODAK PARK AND INVESTIGATION AREA WIA-KPW

FIGURE
1



S.S. PAPADOPULOS & ASSOCIATES, INC.
ENVIRONMENTAL & WATER-RESOURCE CONSULTANTS

ENVIRONMENTAL INVESTIGATION AREA WIA-KPW

FIGURE
2

in a trench excavated about 10 feet into the bedrock that parallels the main east-west service road near the southern site boundary. A system of smaller sewer lines extend from the main sewer line into WIA-KPW to collect storm water, building sump discharge, and wastewater from various chemical manufacturing areas. The water is discharged to the Genessee River after it is treated at the KLWPP. A sanitary sewer system that discharges at the Van Lare publicly-owned treatment work overlies the industrial sewer in WIA-KPW.

Chemicals have been handled in many areas of KPW and a number of releases have been recorded beginning in the late 1970's. As part of the process of applying for a permit to manage hazardous waste at Kodak Park, Kodak was required to identify solid waste management units (SWMUs) in KPW. SWMUs in KPW include underground storage tanks, portions of an inactive hazardous waste disposal site, and other areas where significant releases have occurred. As of November 1994, Kodak identified 176 SWMUs in KPW. Documented releases account for over 500,000 gallons of chemicals lost from SWMUs. A portion of the released material was recovered or flowed to the industrial sewer, and the remainder of which infiltrated into site soils or volatilized.

Investigations at the site have identified a number subsurface zones that have contrasting hydrogeologic properties. In order of increasing depth, these include:

1) Overburden - Unconsolidated materials, primarily glacially derived sands, silts, and clays and in some cases fill material including construction/demolition debris and boiler ash. The water table generally occurs in this interval.

2) Top-of-Rock - The uppermost bedrock, typically moderately to highly 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.

3) 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.

4) 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.

5) Queenston Shale - Interbedded siltstones and shales with no discernible horizontal interval of elevated hydraulic conductivity. Discrete intervals of elevated hydraulic conductivity are present.

The presence of the industrial sewer system within KPW appears to have limited the lateral migration of contaminated groundwater. The sewer has affected groundwater flow because many of the sewer lines are positioned below the groundwater table, and the lines are not water-tight. This causes groundwater to flow into the sewer line, limiting the degree to which

groundwater contaminants have spread in the subsurface.

Summary of Facility Risks

Contaminated Media and Chemicals of Concern

Numerous studies have been performed by Kodak (see attached bibliography) and have shown extensive contamination of the soil and groundwater in WIA-KPW. Contaminants of concern at the site include chlorinated and non-chlorinated volatile and semivolatile organic compounds and metals. Volatile organic chemicals (solvents) are the most widespread type of contaminant observed in the groundwater and soil. Tables 1 through 4 in Attachment 1 list chemicals that have been found in groundwater at the site. Relevant groundwater quality criteria are also shown in the tables. Investigations have also identified groundwater contamination in the bedrock in some of the surrounding offsite areas. Health-related studies including surface soil, soil gas and indoor air testing have been conducted in Rand Street neighborhood, on the south side of KPW. Although the groundwater at depth in portions of this area has shown contamination, the health-related studies did not identify any health concerns related to the presence of the groundwater contamination. Groundwater at the site and in the surrounding neighborhood is not used as a source for drinking water. Drinking water in this area is supplied by a municipal system operated by Monroe County.

Baseline Exposure Scenarios

Soils

For soils, two exposure scenarios were evaluated: (1) ingestion exposure for surficial soils; and (2) potential for the contamination in all soils (both surficial and at depth) to adversely impact the groundwater (i.e., be expected to cause exceedances of groundwater quality criteria).

Soil Ingestion Exposure Pathway

Kodak used a two step screening process to identify soils that have the potential to pose a health threat under differing future uses of WIA-KPW. The first step looked at unrestricted use and screened surficial soil (0-2 feet) samples against residential exposure criteria based on direct ingestion/contact. If soils did not exceed this screening criteria, there would not be any reason to restrict future use to protect against this exposure pathway. The next step looked at samples that exceeded the residential exposure criteria. These samples were evaluated against criteria developed to represent a commercial/industrial exposure scenario. With one exception (arsenic), the commercial-industrial criteria are higher than the residential values. In KPW, surficial soils had concentrations falling into the three following categories: (1) less than residential exposure criteria [unrestricted use]; (2) exceeds residential criteria but does not exceed commercial industrial criteria [action not necessary if future use is restricted to commercial-industrial]; and, (3) exceeds commercial/industrial criteria [action required, even for commercial-industrial use].

Soil samples classified as category 2 described above are relatively widespread in surficial soils

of WIA-KPW. To control exposure to this category of soil, Kodak has proposed instituting deed restrictions to the title for WIA-KPW to ensure that future use will be limited to commercial-industrial operations. Other uses will not be permitted until Kodak can demonstrate that the surficial soils no longer exceed residential exposure criteria.

To address category 3 surface soils, Kodak has proposed eliminating the exposure pathway through placing cover materials (paving, etc.) and/or fencing off areas where exceedances exist. Such cover materials and/or access restrictions are already in place for a number of the exceedances. To control 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.

Soil Impacts to Groundwater Quality

In this evaluation, contaminant concentrations from all soil samples (both from the surface and at depth from borings) were screened to identify soils that have the potential to cause groundwater to be contaminated at concentrations higher than NYS groundwater standards (using values listed in NYSDEC TAGM HWR-94-4046). These values are generally much lower than the ingestion exposure values discussed above. This comparison showed exceedances of the TAGM 4046 values throughout WIA-KPW. This shows that the soils are sufficiently contaminated to pose a threat to the groundwater through potential leaching of contaminants. Development of the site limits measures that could be taken to address the soil contamination. The high density of subsurface utilities, presence of buildings and foundations, and the widespread nature of the soil contamination complicate and reduce the effectiveness of excavation and treatment/disposal as a remedial alternative for the soils. In light of the difficulties and limited expectation for success, taking direct action on the soils on a site-wide basis was eliminated further consideration. Excavation and treatment of localized areas of highly contaminated soils has been retained as a possible remedial component, however, the CMS has not identified any areas where such actions are planned. Rather than directly addressing the potential impact of the soils on groundwater quality, Kodak has proposed implementing a groundwater remedial alternative that will also address contaminants leaching from soils.

Groundwater

Groundwater within KPW is generally contaminated above New York State Groundwater Standards, with portions showing very high concentrations of contaminants. Two groundwater exposure scenarios were evaluated in detail. These included: (1) possible exposure to residents posed by migration of contaminated groundwater off-site, with contaminants volatilizing into the air in homes; and, (2) possible exposure to workers in the CSOAP tunnel due to the interception and volatilization of contaminants from groundwater.

Potential for exposure due to the ingestion of contaminated groundwater was also considered. Although groundwater concentrations at the site are far above drinking water standards, the current risk of such exposure is precluded by availability of high quality water from the

municipal water system that supplies drinking water in this area, the generally poor quantity and quality of the groundwater in this region (low well yields because of the low permeability subsurface geology; high concentrations of dissolved solids - iron, etc.). Potential migration of chemicals to the Genessee River and subsequent exposures was considered as well. Computer simulations of groundwater flow under the recommended alternative were performed. These simulations indicate that expected loadings to the river from groundwater flowing from WIA-KPW would be far less than 1 kilogram per year. Due to the large flow in the river, this loading would not be measurable even with the most sensitive analytical method currently available. Because of the very low loading rate, the risks posed by this discharge are negligible.

Scope of Proposed Corrective Action

WIA-KPW has a history of numerous releases of solvents to the environment. These releases have significant implications about the possibility of restoring the site to pre-release conditions. Many of these releases involved chlorinated solvents that are denser than water. These releases rapidly transfer large, concentrated masses of contaminants into the subsurface that are very difficult to remove. Models run using existing technology suggest it may take hundreds of years to reach groundwater standards. Chlorinated solvents have been found in the subsurface at KPW as separate phase organic liquids. These materials, referred to as Non-Aqueous Phase Liquid (NAPL), can be lighter than water (LNAPL) or denser than water (DNAPL). LNAPL floats on the water table so its location can be determined reasonably easily. DNAPL sinks so its presence and movement in the subsurface is difficult to predict, particularly where the movement occurs in fractured bedrock as under WIA-KPW.

Subsurface features like sediment grain size and local fracture networks in bedrock control DNAPL movement, making it difficult if not impossible to locate after release. Recent research also suggests that contaminants released as DNAPLs may not reside in the subsurface in that form for very long. This research shows contaminants in the DNAPL can rapidly (on the order of 1-3 years) diffuse from fractures into the surrounding rock, resulting in the "disappearance" of the DNAPL. The contaminants are still present in the subsurface, but instead of being present in the form of a separate organic liquid, the contaminants are stored in the matrix of the rock and are generally shielded from groundwater flow through the adjacent fracture network.

The nature and extent of contamination in WIA-KPW makes it technically impracticable to remediate the site to pre-release conditions. This is due to presence of DNAPL, contaminant diffusion into the rock matrix and the complex nature of groundwater flow in fractured bedrock conditions. Removal of contaminant mass in the rock matrix is diffussion controlled and proceeds slowly (rough estimates are that it takes on the order of ten times as long for contaminants to diffuse out of the matrix than it does for contaminants to diffuse into the matrix). The rock matrix will act as a continuing source that will release contaminants to the groundwater flowing through fractures at concentrations in excess of New York State Groundwater Standards for many years. Currently there are no technologies capable of achieving pre-release conditions in the short term (<10 years). For more information on this issue, please refer to the Technical Impracticability Evaluation for Groundwater Restoration (Attachment 1) that the Department has prepared.

The Proposed Remedy

Since achievement of pre-release conditions does not appear to be feasible at this time, alternate goals were established for both the soils and groundwater. For groundwater, goals for the overburden/top-of-rock (upper) flow zone and the underlying (lower) flow zones differ. For the upper zone, the goal is prevention of offsite migration from WIA-KPW (full containment that precludes further expansion of the plume in this zone). This will be accomplished by active pumping from extraction wells and through passive infiltration of groundwater to the industrial sewer system. This will eliminate potential future risk to offsite residents associated with contaminant exposure from groundwater migration. It will also remove contaminant mass from the subsurface environment in WIA-KPW. This should eventually result in decreasing contaminant concentrations in the groundwater, although levels would be expected to remain above state groundwater criteria for an extended period of time.

For the lower bedrock flow zones the goal is to contain groundwater to the extent necessary to protect human health and the environment, and where a significant benefit can be realized at a reasonable cost. This will be accomplished through active pumping of extraction wells in the area of the highest concentration of contaminants in the GQ zone and through passive discharge of groundwater to the CSOAP tunnel system. Water in the CSOAP tunnel system is treated at the Van Lare POTW before it is discharged. A portion of the groundwater in the lower bedrock (computer simulations estimate ~15% of the GQ zone discharge, or less than 3% of the combined shallow and GQ discharge) is not collected by either of these mechanisms, and moves laterally within this zone or moves into the underlying Queenston formation. This flow ultimately discharges to the Genessee River Gorge or Lake Ontario.

The remedy will include a groundwater monitoring program to ensure that the implemented measure meets its design objectives. The monitoring program will provide a means of identifying and correcting problems that may develop in the future. The program will also provide data that can be used to aid in the design of enhancements to the remedy that may be needed in the future.

Groundwater at this site will require long-term remedial action. These actions will also address contaminants leaching from soils, so the only exposure associated with soils that needs to be considered is direct contact/ingestion. Since Kodak has agreed to place notices in the deed that restrict future use of WIA-KPW to commercial/industrial operations until such time as contaminant levels are less than residential exposure criteria, only those soils exceeding commercial industrial criteria need action at this time. These exposures will be eliminated through the placement of cover or through access restrictions (fencing).

Remedial Actions to Date

Kodak has already taken a number of actions to control groundwater contamination at WIA-KPW. These measures have included collection and treatment of groundwater as well as measures to reduce the potential for further groundwater contamination, such as the renovation of

the tank-storage facilities and upgrading segments of the sewer system. To date, Kodak's groundwater efforts have focused on the interception and extraction of water from two areas that are highly contaminated: the area surrounding Building 119, and the area near Building 115 within the distilling area. Actions have also been taken to intercept groundwater in the Grimsby-Queenston contact (GQ - see flow zone descriptions provided below) flow zone in the southern part of KPW. An action was also taken in the KPE part of the study area in response to a large spill of solvents beneath the West Ridge Road-Kodak Park railroad bridge. A total of ten extraction wells are currently operating in WIA-KPW.

The Building 119 extraction system operates in the top-of-rock zone. Six extraction wells were installed, with three wells installed in 1982 and three more in 1985. One of these wells was abandoned in March 1991. Near Building 115, two top-of-rock extraction wells were installed and began operating in 1988. The system in southern KPW was installed in 1992 and consists of four extraction wells designed to prevent offsite migration to the south of KPW in the lower bedrock (GQ) zone. In response to the West Ridge Road spill, eight recovery points were operated in the overburden/top-of-rock zone using combined vapor (vacuum) and groundwater extraction. This system operated during 1989 and 1990, until contaminant mass recovery rates declined sharply and it was no longer recovering significant contaminant mass.

Summary of the Alternatives

Kodak analyzed four remedial alternatives for WIA-KPW in detail in a Corrective Measures Study (CMS) report. All four alternatives include the same recommended action for soils and differ only in how they address the groundwater contamination. The 4 groundwater alternatives evaluated were: (1) passive (no active pumping wells) collection of groundwater through seepage into Kodak's industrial sewer system and into the municipal combined sewer overflow abatement program tunnels; (2) continued pumping of active groundwater pumping wells that have already been installed and are in operation; (3) continued pumping of 1 existing recovery well and the installation and pumping of 5 new wells; and, (4) the recommended alternative includes continued operation of 3 existing overburden and top-of-rock wells and an existing GQ zone Migration Control System (MCS), which currently consists of 4 pumping wells. Passive seepage of groundwater into the industrial sewer and municipal sewer tunnel system is also a significant component of the last three alternatives.

Remedial Alternative #4, that the Department is proposing be implemented for WIA-KPW, is also the alternative that was recommended in the CMS report that Kodak submitted. The CMS 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.

Groundwater Alternatives

As discussed above, the industrial sewer system and the CSOAP tunnel system exert a strong influence on groundwater flow in both the overburden/top-of-rock and GQ monitoring horizons. A significant volume of groundwater in both horizons passively discharges to these sewer

systems. All 4 groundwater alternatives described below incorporate this "passive" component. Computer modeling of the groundwater flow system indicates that under all of the various alternatives described below, passive discharge to these systems is a major component (at least 80%) or in the case of Alternative #1 the sole component of "extraction." All of the alternatives include some degree of monitoring to determine if the alternatives are having the desired effect. They also include institutional controls to limit potential future exposures, through the imposition of deed restrictions.

Alternative #1 - This alternative does not include any active groundwater pumping/recovery wells. This remedy would rely solely on passive collection of groundwater both in the overburden/upper bedrock and in the GQ horizon by discharge to the industrial sewer system and the CSOAP tunnel system, respectively. Operation of existing recovery wells would be terminated, so passive discharge to the sewer systems would be responsible for 100% of the extraction. Water level and water quality testing would be performed to monitor changes in the groundwater contaminant plumes. Under this scenario, offsite groundwater flow in the overburden/top-of-rock interval would occur along some fence line segments, and could result in the offsite migration of contaminants. Based on recent sampling results, such migration could pose an unacceptable risk to offsite residents.

Alternative #2 - This alternative includes continued operation of 11 existing groundwater pumping/recovery wells and is considered representative of current conditions. It includes 7 wells in the overburden/top-of-rock zone and 4 wells in the GQ horizon. Under this alternative computer simulations of the flow system estimate 83% of the discharge will be passive features (sewer systems) with the balance discharging to active extraction wells. Water level and water quality testing would be performed to monitor changes in the groundwater contaminant plumes. Under this scenario, minor offsite flows would still occur in the overburden/top-of-rock zone along the north fence line of WIA-KPW. As mentioned for Alternative #1, this flow poses a potentially unacceptable risk, and was eliminated from consideration on this basis.

Alternative #3 - This alternative includes the continued operation of only one existing top-of-rock well and does not include any GQ pumping wells. The only existing top-of-rock well that would be retained is near Building 119. Under this alternative 5 new overburden/top-of-rock wells would be installed near the northern and eastern perimeter of WIA-KPW to provide hydraulic containment (prevent offsite flow) in this zone. For the GQ zone, the existing Lot 50 Migration Control System would be abandoned. Passive discharge to the CSOAP tunnel system would collect some part of the GQ groundwater flow. Under this alternative, computer simulations of the flow system estimate 84% of the discharge will be to passive features with the balance discharging to active extraction wells.

Alternative #4 - (**The Proposed Remedy**) - This alternative includes continued operation of 3 existing overburden and top-of-rock wells and an existing GQ zone Migration Control System (MCS), which currently consists of 4 pumping wells. It also includes the installation of 3 new overburden/top-of-rock pumping/recovery wells. The new wells would be placed to provide hydraulic containment (prevent offsite flow) in this zone, with the new and existing wells located along the northern perimeter of WIA-KPW. Overburden/top-of-rock pumping wells in

the interior of WIA-KPW would be abandoned under this alternative. Most of the groundwater that used to discharge to the pumping wells would discharge to the industrial sewer system under this alternative. This alternative includes an enhanced monitoring program that includes the installation of 2 GQ wells and 1 upper bedrock well north of WIA-KPW. It also includes a monitoring program to evaluate air quality within the CSOAP tunnel system, near WIA-KPW. Under this alternative computer simulations of the flow system estimate 80% of the discharge will be to passive features (sewer systems) and 20% to active extraction wells.

Summary of the Basis for the Selection of the Proposed Remedy

Corrective Measures are evaluated against four general performance standards:

1. overall protection of human health and the environment (how alternatives provide human health and environmental protection)

2. attainment of media clean-up standards (ability of the alternatives to achieve applicable media clean-up standards)

3. control the sources of releases (how alternatives reduce or eliminate to the extent practicable possible further releases)

4. comply with standards for the management of wastes (how alternatives assure that management of wastes during corrective measures is conducted in a protective manner)

1(a) The proposed remedy protects human health by restricting exposure to the soil and groundwater contaminants. For soils at the site this is accomplished by physically isolating the soils by fencing, capping or paving to prevent exposure to surficial soils. Exposure to subsurface soils at the site is controlled by an Excavation Master Plan. This plan provides health and safety and soils management requirements for excavations within Kodak Park. In addition, Kodak will place a notice in the deed for this area that restricts future use to commercial/industrial activities, until such time as Kodak can demonstrate to the Department's satisfaction that this restriction is no longer necessary to protect human health. The soils approach is the same under all four alternatives that were evaluated.

1(b)For groundwater, the proposed remedy protects human health by preventing contaminated shallow groundwater from flowing offsite. This will preclude residential exposure that could be associated with volatilization of contaminants into indoor air. The measure provides environmental protection by containing shallow contaminated groundwater to the site so that additional natural resources are not degraded. The measure will also remove contaminants from the environment through the collection of contaminated groundwater that will be treated prior to discharge.

1(c)The approach for soils at this site is to eliminate direct contact exposure risks through isolation of surficial materials exceeding commercial industrial exposure concentrations, and

restriction of future use of the site so that residential exposure criteria are not applicable. Contaminants that leach from the soils to the groundwater will be addressed through containment and collection of the groundwater.

2(a)The remedial objectives for the soils and groundwater at this site recognize the technical impracticability of achieving restoration of groundwater quality to pre-release conditions. Alternate goals have been established that recognize the technical impracticability of full restoration of the site.

3(a)The proposed remedy recognizes that short-term actions can not effectively remove the contaminant source from the environment. Because of this, the remedy can not prevent the contamination of more groundwater. Instead, the remedy is designed to prevent this water from migrating off-site and causing an expansion of the groundwater plume in the overburden and top-of-rock flow zones. In the very long-term, this action should reduce contaminant concentrations in the source area. For the lower bedrock, the remedy includes active pumping in the most contaminated area of the GQ zone. In other areas, groundwater in this zone will discharge to the CSOAP tunnel system and may involve migration off-site en route to the discharge point.

4(a)Under the proposed remedy, contaminated groundwater would be discharged to the industrial sewer system for treatment at Kodak's treatment plant (KLWPP). Kodak has a federal permit for hazardous waste management activities at Kodak Park. Kodak has also submitted a permit application to NYSDEC for hazardous waste management activities. Groundwater collected by the proposed remedy would generally be classified and managed as a hazardous waste. This water may be discharged to and treated at Kodak's Kings Landing treatment facility under the conditions set forth in a SPDES permit issued by the NYSDEC. Residuals (sludge) from the treatment facility is incinerated at Kodak Park under the terms of consent agreements between Kodak and the State and Federal government. Ash from the incineration is managed as a hazardous waste and shipped off-site to a facility processes this material to recover metals, primarily silver.

Alternatives are further evaluated against the following five selection decision factors:

1. long-term effectiveness and reliability (magnitude of residual risk, adequacy and reliability of controls)

1(a)The proposed remedy and alternatives #2 and #3 employ groundwater extraction technology (pumping wells, flow control and metering) that is widely used in water supply wells and in remediation of groundwater contamination. These technologies are effective and reliable when properly designed and when supported by adequate operation and maintenance measures. The proposed remedy is a long-term action that needs to be operated in perpetuity since it will only very slowly remove contaminants from the subsurface, and early failure of the system would result in unacceptable levels of risk associated with residual contamination of the site. Alternative #1 relies only on passive leakage of groundwater to sewers so it could be viewed as more reliable than active recovery systems where mechanical failures can occur. However, alternative #1 does not satisfy the objective of fully containing groundwater in the upper flow

zones to the site.

2. reduction of toxicity, mobility or volume of wastes (treatment process used and materials treated; amount of hazardous materials destroyed or treated; degree of expected reductions in toxicity, mobility or volume; degree to which treatment is irreversible; type and quantity of residuals remaining after treatment)

2(a)The four groundwater alternatives all offer similar performance for this factor. Although there are minor differences in the volume of groundwater that is collected under the four alternatives, in all cases the water would be treated using the KLWPP. At KLWPP water would be subject to biological treatment that reduces the toxicity and volume of the waste. Sludge from the treatment would be incinerated to further destroy organic material and to reduce the volume. The ash from the sludge would also be processed to separate and recover metals. Treated water would have to comply with limits established by the NYSDEC before it could legally be discharged to the Genessee River.

3. short-term effectiveness (protection of community during remedial actions; protection of workers during remedial actions; environmental impacts; time until remedial action objectives are achieved)

3(a)None of the alternatives involve significant disturbance of subsurface materials. In fact, alternatives #1 and #2 do not involve any construction, since they rely on existing features. The most intrusive actions under consideration include the installation of wells and shallow excavations to connect pumping wells to the industrial sewer, activities that are routinely performed at Kodak Park. Health and Safety plans addressing community and worker safety are already in place at Kodak and would be used during implementation of the selected remedy. The site is already heavily developed so environmental impacts from the proposed remedy would be minimal. Excess soils, if generated, would be managed in accordance with the Kodak Park Excavation Master Plan. Although the recommended alternative involves well installations and connections to the industrial sewer, this could be accomplished in less than 3 months of field work. Once operational, the proposed remedy would rapidly (estimates are within 1 month) contain shallow contaminated groundwater to the site. Alternative #3 provides similar performance, but it could take slightly longer to implement since it would involve the installation of more wells than the proposed remedy. Alternatives #1 and #2 would never be expected to achieve containment.

4. implement ability (ability to construct and operate the technology; reliability of the technology; ease of undertaking additional corrective measures if necessary; ability to monitor the effectiveness of the remedy; coordination with other agencies; availability of off-site treatment, storage and disposal services and specialists; availability of prospective technologies)

4(a)The proposed remedy and alternatives #2 and #3 employ groundwater extraction technology (pumping wells, flow control and metering) that is widely used in water supply wells and in remediation of groundwater contamination. These technologies are effective and reliable when

properly designed and when supported by adequate operation and maintenance measures. The proposed remedy is a long-term action that may need to be operated in perpetuity since it will only very slowly remove contaminants from the subsurface, and early failure of the system would result in unacceptable levels of risk associated with residual contamination of the site. The recommended alternative will not preclude further action; it can easily be incrementally adjusted if the original plan does not attain the design objectives. The effectiveness of the alternatives can be monitored through a combination of water level and chemical monitoring . The proposed remedy includes the installation of additional monitoring wells and a testing program in the CSOAP tunnel to help evaluate performance.

5. cost (capital costs, operating and maintenance costs, present worth costs)

5(a)Total 30 year costs for the groundwater alternatives ranged from $1.171 million to $8.275 million (representing net present value costs ranging from $648,835 to $5,149,418). The recommended alternative has the highest estimated cost. A detailed comparison of costs is provided below. Costs for soils management activities have not been included in these estimates. Soils costs are the same under all alternatives evaluated and do not influence remedy selection.

SUMMARY OF ESTIMATED COSTS FOR
GROUNDWATER REMEDIAL ALTERNATIVES

Alternative	Direct Capital Costs ($)	Present Value of Direct Capital Costs ($)	Indirect Capital Costs ($)	Present Value of Indirect Capital Costs ($)	Annual Costs ($)	Present Value of Annual Costs ($)	Total 30 Year Cost ($)	Net Present Value ($)
# 1	100,000	100,000	51,000	26,135	34,000	522,700	1,171,000	648,835
# 2	1,003,000	553,849	595,350	301,525	156,100	2,399,700	6,281,350	3,255,074
# 3	1,749,000	1,564,055	810,500	662,947	100,600	1,546,500	5,577,500	3,773,502
# 4	2,119,000	1,709,975	1,088,975	803,773	166,250	2,555,670	8,275,475	5,149,418

Public Participation

The Department encourages input from the community on the selection of an appropriate remedy for the site. The public is invited to comment on the suitability and appropriateness of the identified remedial alternatives or any other alternatives that have not been discussed in this Statement of Basis. The Department has set a public comment period from July 3, 1996 to September 3, 1996, to solicit public comments on the proposed remedy. Send written comments to: Mr. Peter Lent, Regulatory Services, New York State Department of Environmental Conservation, Region 8, 6274 East Avon-Lima Road, Avon, NY 14414, Telephone: 716/226-2466.

All comments will be considered by the Department in the final selection of a remedy for the site. A response to any comments received during the public notice period will be issued when the remedy is selected. The response to comments will identify any changes in the site remedy and will describe and respond to the issues raised by the public. A notice of the decision will be sent to each person who submits written comments or who requests such notice.

All comments must be submitted in writing no later than September 3, 1996.

Documents the Department Used in its Decision making

See Attachment 2 for a list of references used by the Department.

Attachment 2

REFERENCES

Eastman Kodak Company, 1993a, RCRA Facility Investigation, Description of Current Conditions for the Kodak Park Corrective Action Program: Kodak Park Facility, Eastman Kodak Company, Rochester, New York, December 8, 1993.

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Eckenfelder, Inc., 1992b, Well Installation Report KPW Migration Control System Interim Remedial Measure, Kodak Park West, Rochester, New York: Report prepared for Eastman Kodak Company, January 1992.

H & A of New York, 1988, Report on Offsite Historical Review, Kodak Park Study Area No. 1: Report prepared for Eastman Kodak Company, October 26, 1988.

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H & A of New York, 1989, Overburden Monitoring Well Installation Technical Memorandum, Offsite Hydrogeologic Investigation, Study Area No. 1: Report prepared for Eastman Kodak Company, July 24, 1989.

H & A of New York, 1989, Investigations and Recommendations for Existing Monitoring Wells in KPW Study Area No. 1: Report prepared for Eastman Kodak Company, July 27, 1989.

H & A of New York, 1989, Review of Offsite Utilities, Technical Memorandum, Offsite Hydrogeologic Investigation, Study Area No. 1: Report prepared for Eastman Kodak Company, July 28, 1989.