CONCEPTUAL DESIGN
GROUNDWATER RECOVERY AND TREATMENT SYSTEM
AC ROCHESTER
LEXINGTON AVENUE
ROCHESTER, NEW YORK

by

H&A of New York
Rochester, New York

for

AC Rochester
Rochester, New York

File No. 70014-46
August 1991

H & A OF NEW YORK

Geotechnical Engineers &
Environmental Consultants

30 August 1991
File No. 70014-46

AC Rochester Division
General Motors Corporation
Box 1790
Rochester, New York 14612-1790

Attention: Mr. Richard C. Eisenman
Environmental Activities Engineer

Subject: Conceptual Design
Groundwater Recovery and Treatment System
AC Rochester
Lexington Avenue
Rochester, New York

Gentlemen:

This document describes the groundwater recovery and treatment system proposed for installation at the AC Rochester (ACR) Lexington Avenue Facility. The facility is located as shown on Figure 1, Project Locus.

H&A of New York (H&A) has been involved in a program to identify and mitigate potential on-site environmental problems since 1988. This program has included on-site investigations conducted within the interior and exterior areas of the Lexington Avenue manufacturing complex to identify the areal and vertical extent of soil, soil-vapor and/or groundwater contamination by various chlorinated solvents.

Chlorinated solvents including trichloroethylene (TCE) and tetrachloroethylene (PERC) and associated break-down components have been identified in monitoring wells installed along the Driving Park Avenue site boundary of the ACR manufacturing complex, hydraulically downgradient from the Lexington Avenue facility. The apparent areal and vertical extent of the dissolved chlorinated solvent groundwater contaminant plume is discussed in a report prepared by H&A of New York entitled "Summary Report, 1991 Migration Control System Supplementary Field Investigation, AC Rochester, Lexington Avenue Facility, Rochester, New York", dated 23 August 1991.

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H&A made recommendations in its 23 August 1991 report relative to the implementation of control of the groundwater flow upgradient of the Driving Park Avenue site boundary to limit potential off-site contaminant migration.

The proposed migration control system is comprised of a blasted-bedrock trench, recovery wells and collection appurtenances installed beneath the parking lot adjacent to Driving Park Avenue. Future phases of construction may include additional recovery system(s) as determined by the site assessment results and monitoring performance of current systems.

The groundwater treatment system will receive recovered groundwater during system start up from the initial pumping wells and the proposed blasted trench, but will be sized and configured for ready expansion and treatment of additional influent streams generated by other yet-to-be-developed on-site remedial activities.

The main components of the proposed system are as follows:

1. Migration Control System - A 1200-foot long blasted-bedrock trench is planned parallel to Driving Park Avenue at the location shown on Figure 2. The trench will be blasted to approximately 25 feet below top of bedrock to enhance permeability of the existing bedrock and allow contaminated groundwater within the bedrock to be recovered on-site. This system is intended to control groundwater flow upgradient of the Driving Park Avenue site boundary to limit potential offsite migration of the contaminant plume identified to be present beneath the AC Rochester facility.

   As discussed in H&A's 23 August 1991 report, total volatile organic compounds (VOC's) have been evidenced in groundwater samples from wells R-103 and R-105 at concentration levels of approximately 50 to 90 ppm. The proposed location of the blasted-bedrock trench, upgradient of the 7-foot-diameter city sewer tunnel, should allow capture of the contaminant plume evidenced at these wells without accelerating groundwater flow and/or contaminant transport toward the tunnel and/or site property boundary.

   The blasted trench will have two recovery wells installed for recovery of groundwater and collection appurtenances for transfer of the effluent to the on-site treatment process. Each well is anticipated to yield approximately 40 gallons-per-minute (gpm) during peak flow periods. Actual

yields may vary significantly from this initial estimate Piping is purposefully oversized in the event recovered rates-exceed the estimate.

2. Collection Piping - The recovery wells will feed into a collection piping network comprised of a single wall synthetic piping material installed below grade for frost protection. The piping will be located above and upgradient of the proposed blasted-bedrock trench. The pipe system materials will be selected to assure chemical compatibility with the contaminants in the groundwater stream, as well as provide leak proof connections and joints. The collection piping will be connected to a process surge vessel through existing piping at the wastewater treatment complex. The piping will be configured to allow recovered groundwater to be charged directly to the treatment unit in the event the surge vessel is not available due to maintenance or other activities.

3. Recovered Groundwater Surge Vessel - An existing open-top wastewater feed/collection tank (currently designated Day Tank #3) located in the wastewater treatment complex will be used to hold recovered groundwater and allow stable process flows to the treatment system. The tank is currently in-place and used for wastewater treatment and will require few modifications for this service.

   Initially the surge vessel would be used to hold all production from the recovery wells and accumulate an inventory for processing during a "dayshift" operation. As the volume of water recovered for treatment and processing increases, the treatment unit will be operated more hours per day with ultimate operation around the clock.

   The surge vessel/feed tank will also afford opportunities for scheduled maintenance and servicing of treatment equipment without shutdown of groundwater recovery systems. Accumulated groundwater recovered when the treatment system is shutdown for maintenance would be processed by operating for longer periods of time and/or higher rates after the unit is returned to service.

   The existing feed piping will be modified to allow all well production to pass through the vessel fully or partially, or bypass the vessel to allow treatment when the vessel is out of service for maintenance. Existing inlet piping will have a valve added to allow a "side in" feed arrangement, with existing bottom outlet piping to the feed pump suction remaining in place.

The surge vessel is currently in wastewater service and will utilize existing level indicators and alarms to advise of high/low levels and monitor level changes. The level indicators will be interlocked to shutdown recovery well pumps on high level and the treatment unit and feed system on low level. Interlocks for feed system shutdown on low level are existing.

The surge vessel and piping system will be winterized to prevent freezing and loss of operating time during cold weather periods, as warranted.

4. Feed Control Systems - The feed control system will utilize existing idle equipment and piping within the wastewater treatment complex with new piping installed where necessary to interconnect with the groundwater treatment unit. Piping will be modified to positively isolate existing process wastewater streams from the recovered groundwater system.

   The performance curves of the existing pumping equipment appear to correspond closely to the proposed operational rates of the groundwater treatment unit. Pump modifications will be specified (either impeller or motor speed change) if in final review the pumps are not capable of providing optimum feed rates.

   Flow to the treatment unit will be controlled with a new flow recording controller to provide uniform feed rates, allow optimum treatment unit performance, and provide a backup record of treated quantities.

   When the feed surge tank level reaches a predetermined set point, the control system will cause the feed system to be shutdown automatically. The treatment unit would then shutdown based on loss of feedwater flow.

A process flow diagram, reflecting proposed equipment arrangements is shown in Figure 3.

The system proposed will have the capability for future expansion to accommodate groundwater streams that may be recovered from other locations on the AC Rochester site.

FUNCTIONAL DESCRIPTION:

The groundwater recovery, feed surge tank and processing system will operate as follows:

The blasted-bedrock trench installation will enhance permeability in the bedrock and should allow implementation of control of groundwater flow, upgradient of the northern site property boundary. Two recovery wells will be sited at appropriate locations within the trench to pump collected groundwater to treatment. Trench and approximate recovery well locations are shown on Figure 2.

Water that enters the trench will pass to the recovery wells where float controlled submersible pumps will pump the groundwater into the recovery system. The pump stations and controls will be installed in a below-grade vault that should not interfere with parking lot operations or require winterization.

The pumps will discharge to a piping network which will act as a low pressure force main and carry the recovered groundwater to a process surge tank located adjacent to the wastewater treatment plant. The piping will be made from single wall, synthetic material compatible with the contaminants of concern in the groundwater.

The collection piping will be buried below the frost line and will be located upgradient of the blasted-bedrock trench for the entire route to the wastewater plant.

At the wastewater plant the recovered groundwater will first enter a surge vessel. The surge vessel is an existing wastewater holding tank at the wastewater plant converted to this service. The surge vessel will act as a storage and surge control device to allow uniform flow of groundwater to the treatment unit during processing. The surge vessel will also allow for holding of recovered groundwater during periods that the treatment unit system is out of service.

Water collected in the surge tank will be pumped by a centrifugal pump to the treatment unit. It is currently anticipated that a Peroxidation System Inc., perox-pure™ treatment unit will be utilized to treat extracted effluent from the trench/recovery well network. Existing pumps and piping within the wastewater plant have been identified and will be used wherever practical to accomplish this task. All piping systems will be modified as required to provide positive isolation of new recovered groundwater streams from existing process wastewater treatment equipment.

The surge vessel is equipped with high and low level alarms utilizing existing level indicators and alarms. Interlocks will be provided to shutdown recovery wells in the event of high surge vessel level, or the treatment unit and feed system in the event of low surge vessel level respectively.

The groundwater feed system to the treatment unit will have a flow controller to stabilize flow at preset rates and allow the unit to be operated at optimal rates. This will result in a part-day operation for the unit during initial start-up of the groundwater recovery system with additional operating time to be gained as the recovered groundwater flows increase from additional sites at the AC Rochester complex.

The piping and associated appurtenances will be designed to allow for influent and effluent monitoring to assure treatment is occurring at the prescribed levels. Equipment located out of doors and exposed will be winterized to protect them against freeze-ups.

H&A of New York looks forward to assisting AC Rochester with the installation and start-up of this system.

Please feel free to call if you have any further questions or require additional information.

Sincerely yours,
H&A OF NEW YORK

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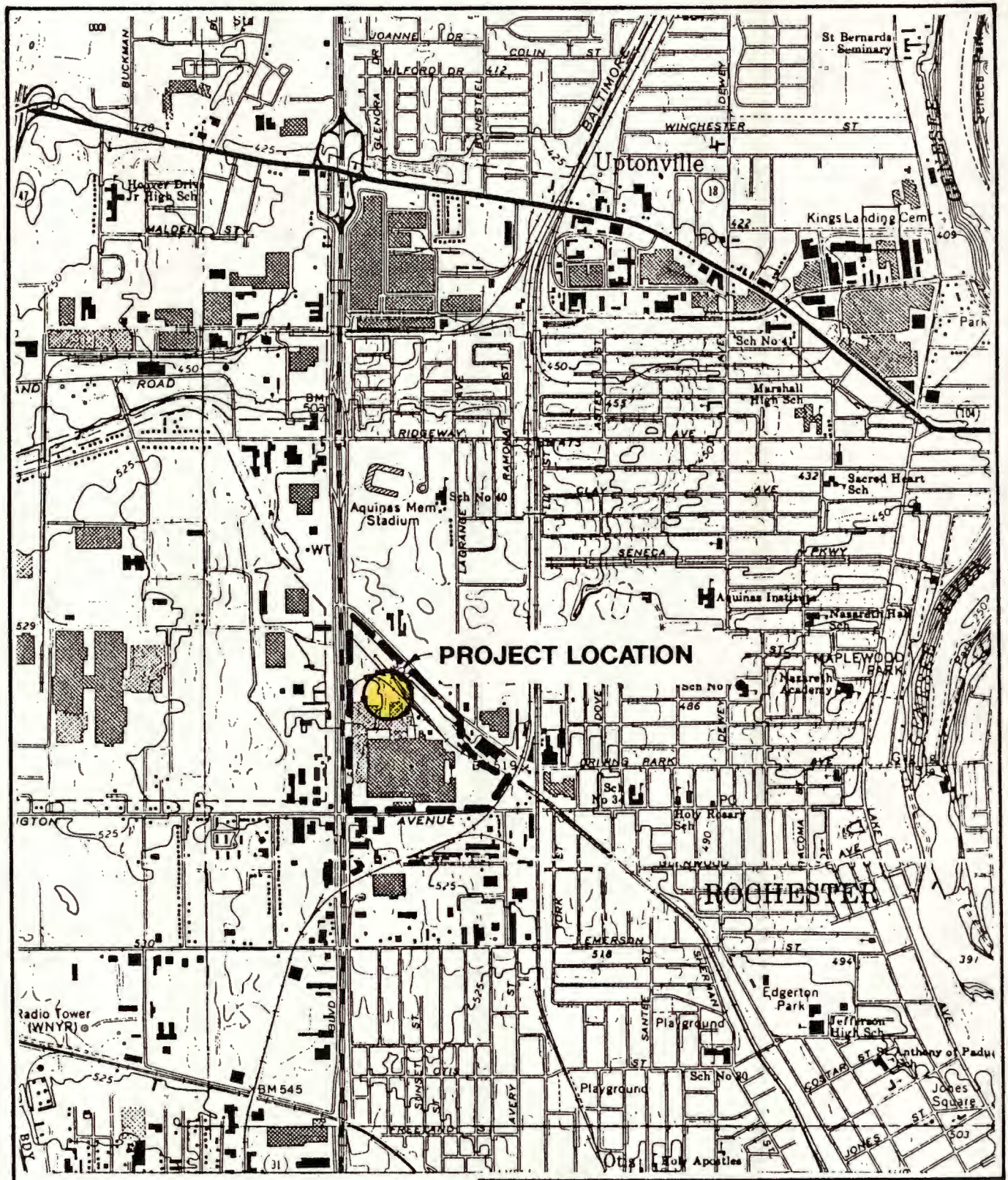


LATITUDE: 43° 10' 52" LONGITUDE: 77° 39' 23"

QUADRANGLE LOCATION

USGS QUADRANGLE: ROCHESTER WEST, N.Y.

H&A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

AC ROCHESTER DIVISION
GENERAL MOTORS CORPORATION
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

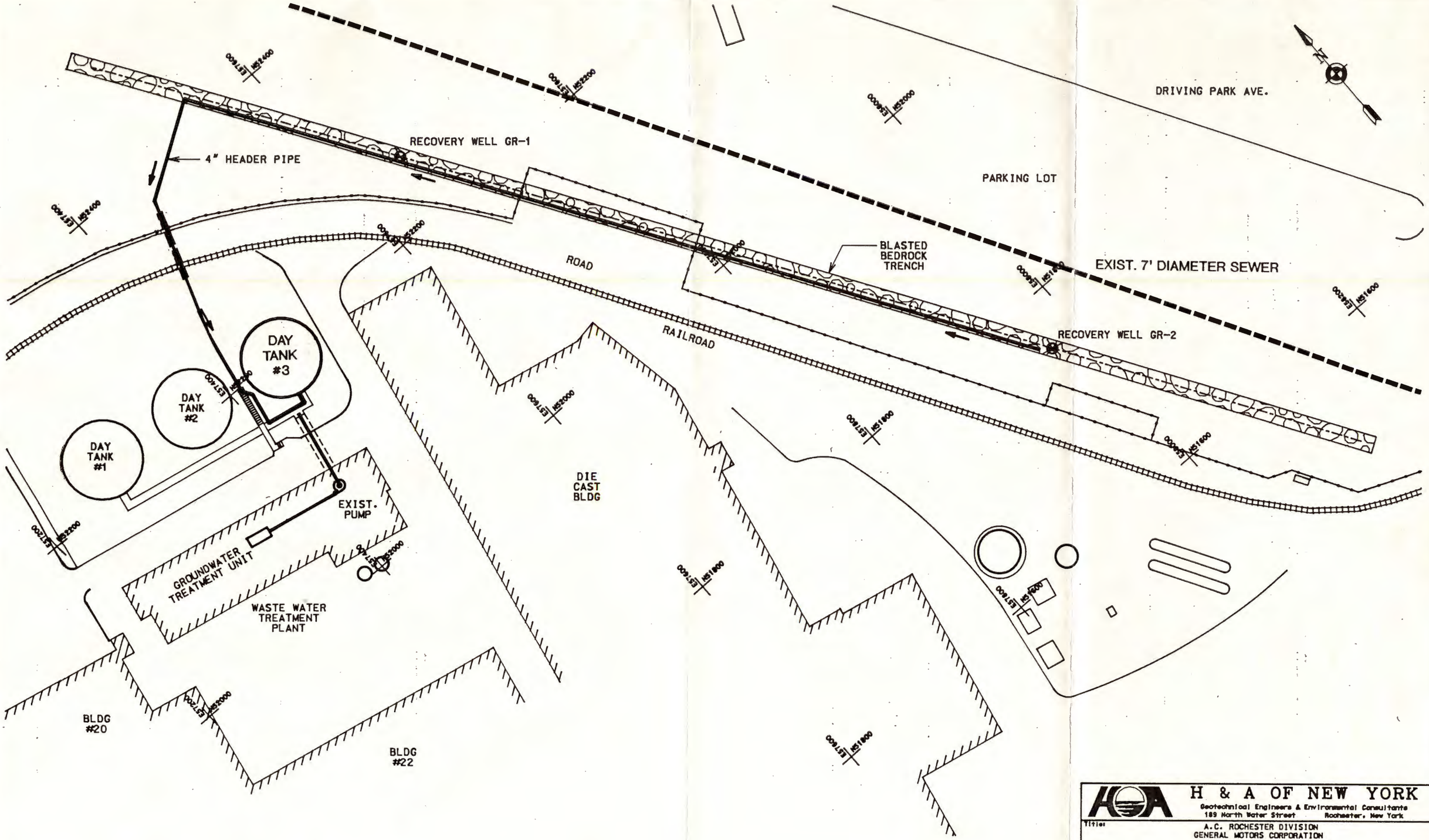
PROJECT LOCUS

SCALE: 1 IN. = 2000 FT. APRIL 1991

FILE NO. 70014-46

CHARRETTE

FIGURE 1



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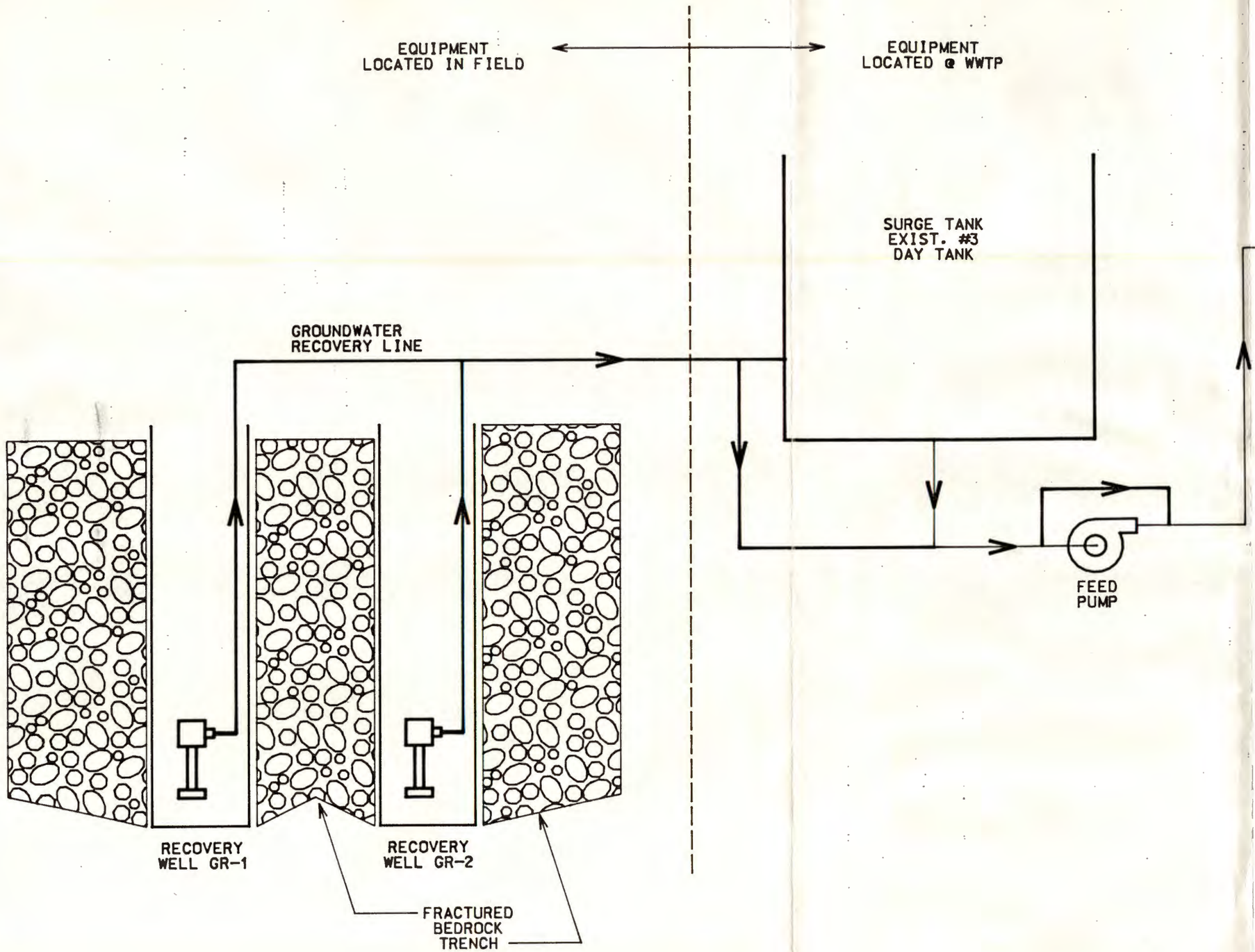
Title:
A.C. ROCHESTER DIVISION
GENERAL MOTORS CORPORATION
LEXINGTON AVENUE FACILITY

BLASTED BEDROCK TRENCH RECOVERY/TREATMENT SYSTEM

SITE PLAN

Scale:	Date:	File No.:	
1" = 800'	28 AUG., 91	70014-46	FIGURE 2



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BLASTED BEDROCK TRENCH
RECOVERY/TREATMENT SYSTEM

FLOW DIAGRAM

Scale:	Date:	File No.:	
NONE	28 AUG., 91	70014-46	FIGURE 3