File on eDOCs X Yes ____ No

Site Name Evans O

Site No: 826011

County Livingston

Town Lima

Foilable X Yes ____ No

File Name report, hw826011. 1995-03.

Scanned & eDOC RI - Progress 5.pdf

826011 - ENARCO - 4th quarter progress report 3/95

H & A OF NEW YORK

Geotechnical Engineers &

Environmental Consultants

~~To MJ Peachey~~
Jim

H&A OF NEW YORK

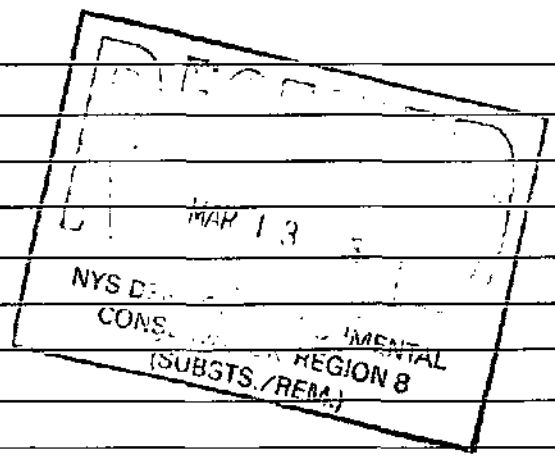
Letter of Transmittal

Geotechnical Engineers &
Environmental Consultants

To	Division of Haz. Waste Remediation	Date	9 March 1995
	NYSDEC, 50 Wolf Rd.	File Number	70372-048
	Albany, New York 12233-7010	Subject	Enarc-O Machine Products RI/FS
Attention	A. Joseph White		---

Copies	Date	Description
4	3/9/94	Quarterly Progress Report No. 4, 3 December 1994 to 3 March 1995, Enarc-O Machine Products Remedial Investigation/Feasibility Study, Lima, New York

Remarks



RECEIVED
MAR 10 1995
NYS DEPT. OF ENVIRONMENTAL
CONSERVATION REGION 8
SWITCHBOARD

Copy To
Director, Bur. Environ. Investigation, NYSDOH
Peter Bush, Region 8 Director, NYSDEC
Glen R. Bailey, Esq., NYSDEC Div. Env. Enforcement
William H. Helferich, III, Harter Secrest & Emery

Signed
Robert J. Mahoney

189 North Water Street
Rochester, NY 14604
716/232-7386

Affiliate
Cambridge, Massachusetts
Denver, Colorado
Glastonbury, Connecticut
Silver Spring, Maryland
Scarborough, Maine
Bedford, New Hampshire
Cleveland, Ohio

QUARTERLY PROGRESS REPORT NO. 4
3 DECEMBER 1994 TO 3 MARCH 1995
ENARC-O MACHINE PRODUCTS, INC.
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LIMA, NEW YORK
NYSDEC CONSENT ORDER NO. B8-0112-91-04

by

H&A of New York
Rochester, New York

for

Kaddis Manufacturing Corp.
Rochester, New York

File No. 70372-048
March 1995

Geotechnical Engineers &
Environmental Consultants

8 March 1995
File No. 70372-048

Ronald Iannucci, Sr., President
Kaddis Manufacturing Corporation
P.O. Box 92985
1100 Beahan Road
Rochester, New York 14692-9085

Subject: Quarterly Progress Report No. 4
Enarc-O Machine Products, Inc. RI/FS

Dear Mr. Iannucci:

H&A has prepared the attached Quarterly Report No. 4 for the Remedial Investigation/Feasibility Study (RI/FS) at the Enarc-O Machine Products site in Lima, New York. The report was prepared in accordance with requirements set forth by the New York State Department of Environmental Conservation in Order on Consent No. B8-0112-91-04 for the project.

The Progress Report provides a summary of work performed by H&A during the last quarter. H&A's work has been performed in accordance with the Work Plan for the project, dated 30 December 1993.

Briefly, work performed during the quarter on the project includes: 1) geophysical logging of selected residential wells; 2) residential well elevation survey performed by a licensed surveyor; and 3) monitoring of water levels in on-site monitoring wells and Honeoye Creek. A request to proceed with residential and onsite well sampling based on the tasks described above, is currently pending with NYSDEC.

Details on these tasks are included in this Progress Report. Copies of this report have been forwarded to NYSDEC (see below) as required by the Consent Order.

If you have any questions regarding the information in this report, please do not hesitate to contact us.

Sincerely yours,
H&A OF NEW YORK

Robert J. Mahoney
Senior Env. Geologist

Vincent B. Dick
Vice President

c: A. Joseph White, Div. Haz. Waste Remed., NYSDEC (4 copies, one unbound)
Director, Bur. Environ. Exposure Investigation, NYSDOH (2 copies)
Peter Bush, Region 8 Director, NYSDEC
Glen R. Bailey, Esq., NYSDEC Div. Env. Enforcement
William H. Helferich, III, Harter Secrest & Emery

189 North Water Street
Rochester, NY 14604-1151
Tel: 716/232-7386
Fax: 716/232-6768

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. INTRODUCTION

This report has been prepared to document recent project activities for the Remedial Investigation/Feasibility Study (RI/FS) being performed at the Enarc-O Machine Products, Inc. facility. The site is located in Lima, New York, as shown on Figure 1. This report is the fourth quarterly progress report to be prepared in accordance with the NYSDEC Order on Consent No. B-0112-91-04 for the site.

The site is owned by Kaddis Manufacturing Corporation (Kaddis) of Rochester, New York. The RI/FS is being performed for Kaddis by H&A of New York (H&A) of Rochester, New York.

This report presents results of field and laboratory investigations during the period 3 December 1994 through 3 March 1995.

II. ACTIONS TAKEN

Project activities conducted during the reporting period consisted of:

- Off-site residential well elevation survey;
- Downhole geophysical logging of five selected residential wells; and
- Water level measurements in Honeoye Creek and on-site monitoring wells;

Each of these tasks is discussed below.

Off-site Residential Well Elevation Survey

D.J. Parrone & Associates of Penfield, New York completed a final elevation survey of the residential wells that are included in the residential well sampling and monitoring program. Ground surface elevation at the well location and top of well casing elevation (and/or other appropriate reference elevation) was taken at each residential well. The elevations are referenced to the National Geodetic Vertical Datum (NGVD) and were measured to the nearest 0.01 feet. Residential well elevations are summarized in Table 1. See also Figures 2 and 3.

Off-site Residential Well Geophysical Logging

Borehole geophysical logging was conducted on four off-site residential wells and the Enarc-O supply well. Refer to Figure 2. In the absence of sufficient residential well construction data or driller's logs, NYSDEC requested downhole geophysical logging be conducted on several offsite wells to obtain information on casing length, open interval, geology, and hydrogeology. The primary purpose of the geophysical logging was to determine zones of possible groundwater flow and thus potential groundwater sampling intervals. Gartner Lee, Inc. of Niagara Falls, New York was contracted to perform the logging, which was conducted on 21 and 22 December 1994, under H&A of New York observation.

The geophysical well logging was conducted at the following addresses: 1081 and 1121 Ideson Road, 7820 and 7873 Martin Road, and the Enarc-O former water supply well. The following geophysical techniques/parameters were utilized/measured: caliper for borehole diameter, temperature and resistivity probe for fluid properties, and video camera inspection for visual identification of borehole features and water flow. The video camera portion of the logging did not yield useful data due to a defective video unit. The equipment defect was not discovered until after the field work was complete and Gartner Lee had demobilized from the site.

H&A summarized results of the geophysical logging in a letter report to NYSDEC dated 3 February 1995. The report is reproduced in its entirety in Appendix A. The following section briefly summarizes the report:

In general, zones that exhibited correlations between caliper anomalies and temperature or resistivity anomalies are thought to represent potential zones of increased permeability. H&A interpreted some of these anomaly correlations as possible zones where groundwater flow into and/or out of the borehole may occur. These anomalies also helped identify zones above the water table where perched groundwater flow was apparently occurring, such as the cascading water in the well at 1121 Ideson Road.

The geophysical data were reviewed for indications of study-area-wide features or trends in the bedrock or groundwater that would aid in determining optimum sampling depths in unlogged wells. In general, none of the logging parameters appeared to delineate specific zones or elevations of bedrock fracturing or groundwater flow common to all wells logged.

However, some common zones were indicated by the geophysical data for the logged wells, and these generally fell into three intervals:

- perched water in the unsaturated zone, where present;
- zones at or near the water table, approximately el. 635 to el. 640; and
- a deeper interval from approximately el. 582 to 612.

Based on interpretation of these data, H&A proposed to NYSDEC in the 3 February 1995 submittal a request to sample the logged wells at the following specific elevations:

- 1081 Ideson - 607 and 640 feet;
- 1121 Ideson - 605 and 673 (cascading water);
- 7820 Martin - 583 and 680 (cascading water);
- 7873 Martin - 592 and 637;
- Enarc-O supply well - 598 and 637;

These data indicated two primary sampling zones, which were then extrapolated to the unlogged wells. Sampling from similar elevations across the study area is expected to allow reasonable comparison of data among wells and would provide an indication of vertical distribution of contaminants in groundwater. Thus, all unlogged wells have been proposed to be sampled at elevations 600 and 640 feet. This was conveyed in H&A's 3 February 1995 letter to NYSDEC. As of this writing, H&A has received verbal indication of concurrence from Gardiner Cross of NYSDEC, but has not yet received NYSDEC written approval of the proposed sampling.

Stream and Groundwater Level Monitoring

A stream staff gauge was installed previously on the Honeoye Creek streambank to provide a fixed reference point from which to measure stream water levels. Water levels in the monitoring wells and Honeoye Creek were measured periodically during this quarter. Hydrographs depicting groundwater and stream level elevations over time are presented in Appendix B.

Enarco
residential
+
onsite
sampling

Monday
m[illegible]

III. DELIVERABLES

In accordance with the consent order requirements, Quarterly Report No. 3, for the reporting period 2 September to 2 December 1994, was mailed to NYSDEC and the consent order mailing list parties on 9 December 1994. No other deliverables were warranted during this quarter.

IV. FUTURE ACTIVITIES

It is anticipated that the following field work, as proposed in the work plan, will be performed in the next quarter:

- initial residential well sampling;
- additional quarterly sampling and laboratory analyses of onsite monitoring wells; and
- additional water level and stream gauge data collection.

Upon completion of the field work and laboratory analyses, preparation of the RI report will begin. Based on the anticipated completion date of the field work and other tasks, completion of the RI report is expected to occur in the second or third quarter of 1995.

In addition, the following activities will be initiated during the next quarter provided the analytical results are received from the proposed sampling;

- Environmental Risk Assessment (resource hazard evaluation);
- Health Risk Assessment; and
- Focused IRM Feasibility Evaluation.

V. WORK SCHEDULE AND PERCENT COMPLETION

A project schedule and list of work tasks is shown in Figure 4. The following 14 work tasks have been completed:

- site survey and base map preparation;
- on-site monitoring well installations;
- source area soil vapor study;
- delineation phase soil vapor study;
- stream staff gauge installation;
- off-site residential soil sampling;
- Enarc-O septic tank sampling;
- first two quarterly on-site monitoring well sampling events;
- on-site well permeability testing (rising head tests);
- ecological site evaluation portion of the environmental risk assessment;
- residential well field evaluation;
- residential well preparation, including pump-pulling;
- residential well geophysical logging; and
- residential well elevation survey.

H&A estimates that the Remedial Investigation is more than two-thirds done, with approximately 14 of 21 estimated tasks completed (see Figure 4).

VI. WORK PLAN MODIFICATION

Modification to the work plan during this quarter consisted of the following:

- *Additional data collection from the residential water wells.* Due to a lack of available well construction data, NYSDEC required H&A to perform downhole geophysical logging in five of the residential wells to evaluate well construction and hydrogeologic characterization of the bedrock for sampling depth(s) determination.

  Results of the geophysical logging and subsequent proposed sampling scheme are discussed in Section II and Appendix A.

- *Quarterly on-site groundwater sampling was not performed during this past quarter.* H&A proposed verbally to NYSDEC that further on-site groundwater sampling be postponed until the residential well sampling was performed. This would allow for a sampling event that would encompass both onsite and offsite wells at the same time. Approval for this proposal was granted through verbal communication with Gardiner Cross (NYSDEC) on 23 February 1995.

  Accordingly, the next quarterly on-site groundwater sampling event will be performed simultaneously with the first residential well sampling event. The residential well sampling will be performed after H&A receives written approval from NYSDEC in response to H&A's proposed residential well sampling plan (letter report, dated 3 February 1995).

VII. CITIZEN PARTICIPATION PLAN ACTIVITIES

No Citizen Participation Plan activities (i.e. public meetings) were scheduled or conducted during the past quarter. None are currently scheduled for the next quarter.

RJM/cad
rjm:70372-048:qrter4.wp

Tables

TABLE 1
OFF–SITE RESIDENTIAL WELL ELEVATIONS

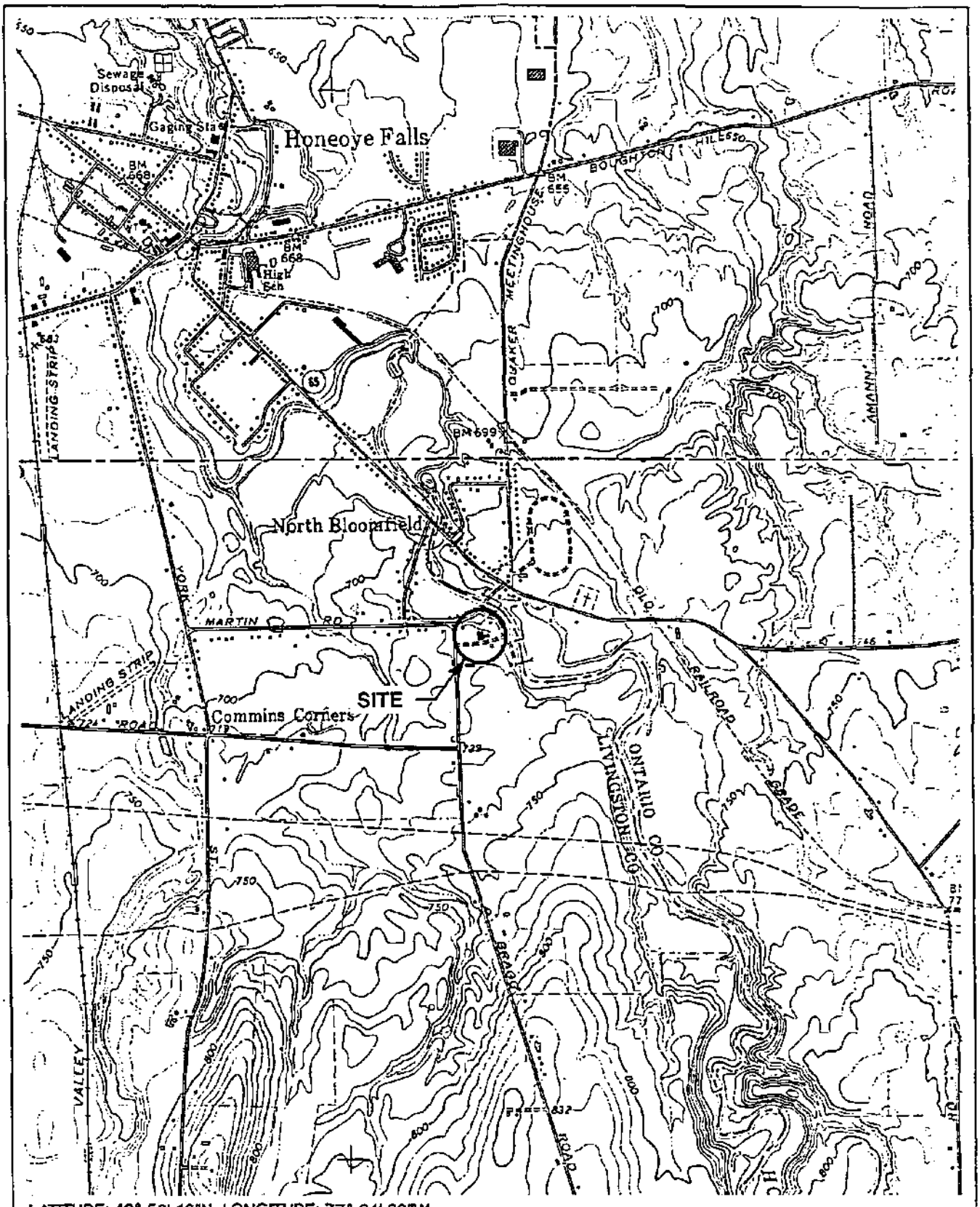
ADDRESS (OWNER)	WELL ELEVATIONS (ft.) TOP OF CASING	BOTTOM OF CASING	APPROX. WELL BOTTOM	WATER LEVEL	PROPOSED SAMPLING ELEVATIONS (APPROX.)
LOGGED WELLS:					
1081 Ideson (Miller)	685.64	672.5	603	643.96	640; 607
1121 Ideson (Cooper)	691.75	684	572	644.06	673 (cascading water); 605
7820 Martin (Johnson)	704.15	680	580	643.82	680 (cascading water); 583
Enarc–O Supply Well	719.88	687	535	643.17	637; 598
7873 Martin (Years)	693.61	687	583	644.43	637; 592
UNLOGGED WELLS:					
1090 Ideson (Colavito)	697.44	unknown	574	643.90	640; 600
1116 Ideson (Maloy)	697.92	unknown	572	643.98	640; 600
1146 Ideson (Reano)	703.46	unknown	578	643.88	640; 600
7852 Martin (Hopkins)	713.79	unknown	573	689.08	640; 600
7880 Martin (Villard)	707.93	unknown	unknown	643.39	640; 600
1167 Bragg (Wildman)	715.30	unknown	584	643.66	640; 600
1191 Bragg (Tondryk)	714.32	unknown	637	692.09	640; 600

NOTES:

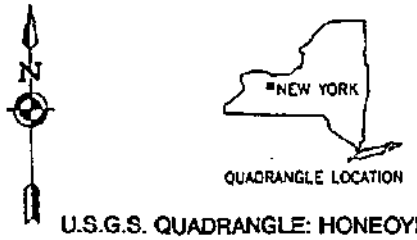
1. Top of casing elevations surveyed by D.J.Parrone on 22 December 1994.
2. Refer to text for discussion of proposed sampling elevations.
3. Water levels measured on 22 December 1994.

RJM – M:\WKS24\70372\WELLSAMP
REV. 3/1/95

Figures



LATITUDE: 42° 56' 13"N LONGITUDE: 77° 34' 33"W



U.S.G.S. QUADRANGLE: HONEOYE FALLS, N.Y.

H&A OF NEW YORK

Geotechnical Engineers & Environmental Consultants

ENARC-O MACHINE PRODUCTS
LIMA, NEW YORK

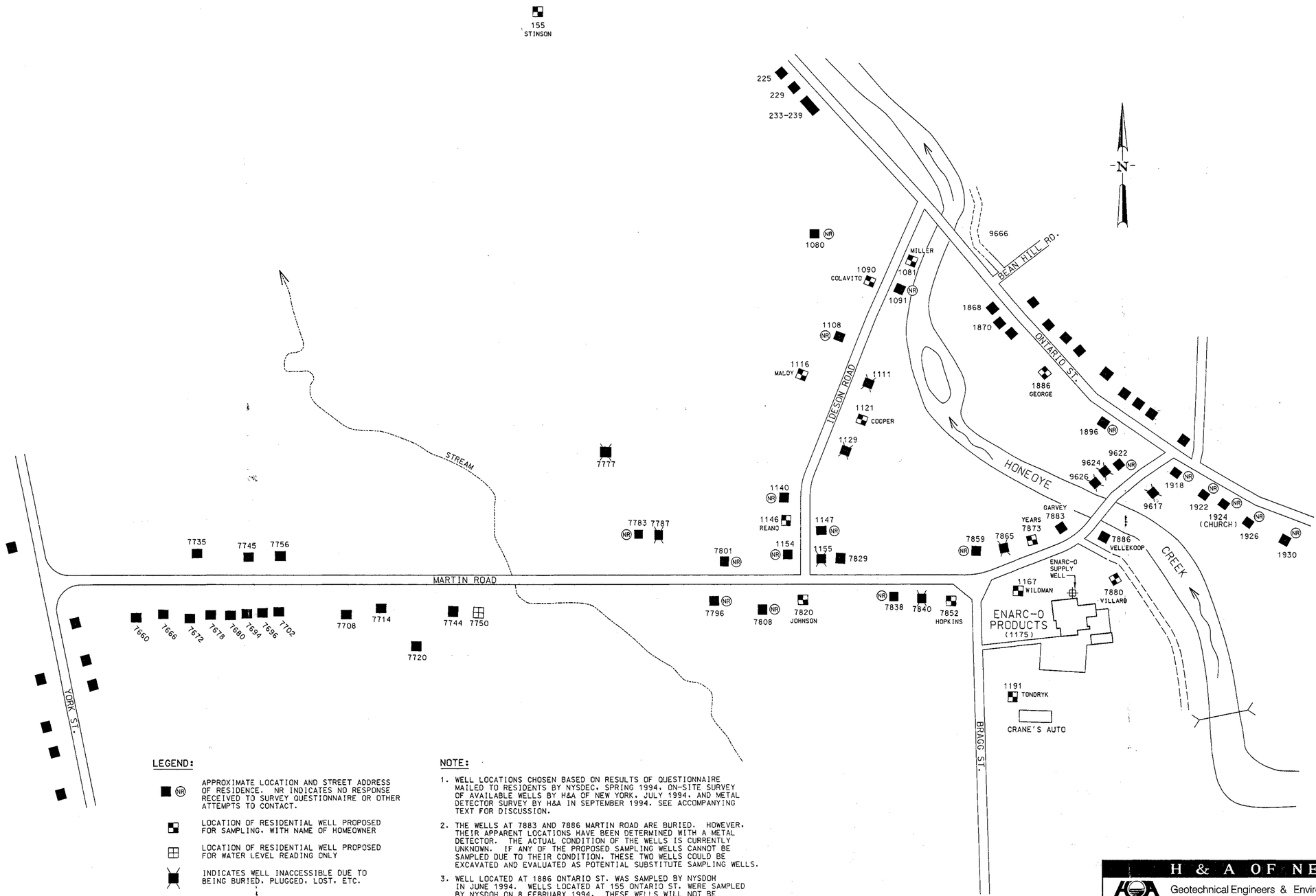
PROJECT LOCUS

SCALE: 1 IN. = 2000 FT. FEBRUARY 1993

FILE NO. 70372-40

MAKEPEACE

FIGURE 1



LEGEND:

- ■ (NR) — APPROXIMATE LOCATION AND STREET ADDRESS OF RESIDENCE. NR INDICATES NO RESPONSE RECEIVED TO SURVEY QUESTIONNAIRE OR OTHER ATTEMPTS TO CONTACT.
- ■ — LOCATION OF RESIDENTIAL WELL PROPOSED FOR SAMPLING, WITH NAME OF HOMEOWNER
- ⊞ — LOCATION OF RESIDENTIAL WELL PROPOSED FOR WATER LEVEL READING ONLY
- ⋈ — INDICATES WELL INACCESSIBLE DUE TO BEING BURIED, PLUGGED, LOST, ETC.

NOTE:

1. WELL LOCATIONS CHOSEN BASED ON RESULTS OF QUESTIONNAIRE MAILED TO RESIDENTS BY NYSDEC, SPRING 1994, ON-SITE SURVEY OF AVAILABLE WELLS BY H&A OF NEW YORK, JULY 1994, AND METAL DETECTOR SURVEY BY H&A IN SEPTEMBER 1994. SEE ACCOMPANYING TEXT FOR DISCUSSION.
2. THE WELLS AT 7883 AND 7886 MARTIN ROAD ARE BURIED. HOWEVER, THEIR APPARENT LOCATIONS HAVE BEEN DETERMINED WITH A METAL DETECTOR. THE ACTUAL CONDITION OF THE WELLS IS CURRENTLY UNKNOWN. IF ANY OF THE PROPOSED SAMPLING WELLS CANNOT BE SAMPLED DUE TO THEIR CONDITION, THESE TWO WELLS COULD BE EXCAVATED AND EVALUATED AS POTENTIAL SUBSTITUTE SAMPLING WELLS.
3. WELL LOCATED AT 1886 ONTARIO ST. WAS SAMPLED BY NYSDOH IN JUNE 1994. WELLS LOCATED AT 155 ONTARIO ST. WERE SAMPLED BY NYSDOH ON 8 FEBRUARY 1994. THESE WELLS WILL NOT BE RESAMPLED BY H& A OF NEW YORK.
4. WELLS LOCATED AT 7660 THROUGH 7756 MARTIN ROAD WERE EXCLUDED FROM THIS SURVEY, BASED ON HISTORICAL SAMPLING RESULTS BY NYSDOH. THE WELL AT 7750 MARTIN ROAD WILL BE USED FOR WATER LEVEL DETERMINATION ONLY.
5. GEOPHYSICAL LOGGING WAS CONDUCTED ON THE WELLS AT 7820 AND 7873 MARTIN RD., 1081 AND 1121 IDESON RD., AND THE ENARC-O SUPPLY WELL ON 21 AND 22 DECEMBER 1994 BY GARTNER LEE, INC. UNDER THE OBSERVATION OF H&A OF NEW YORK

H & A OF NEW YORK

Geotechnical Engineers & Environmental Consultants

ENARC-O MACHINE PRODUCTS
LIMA, NEW YORK

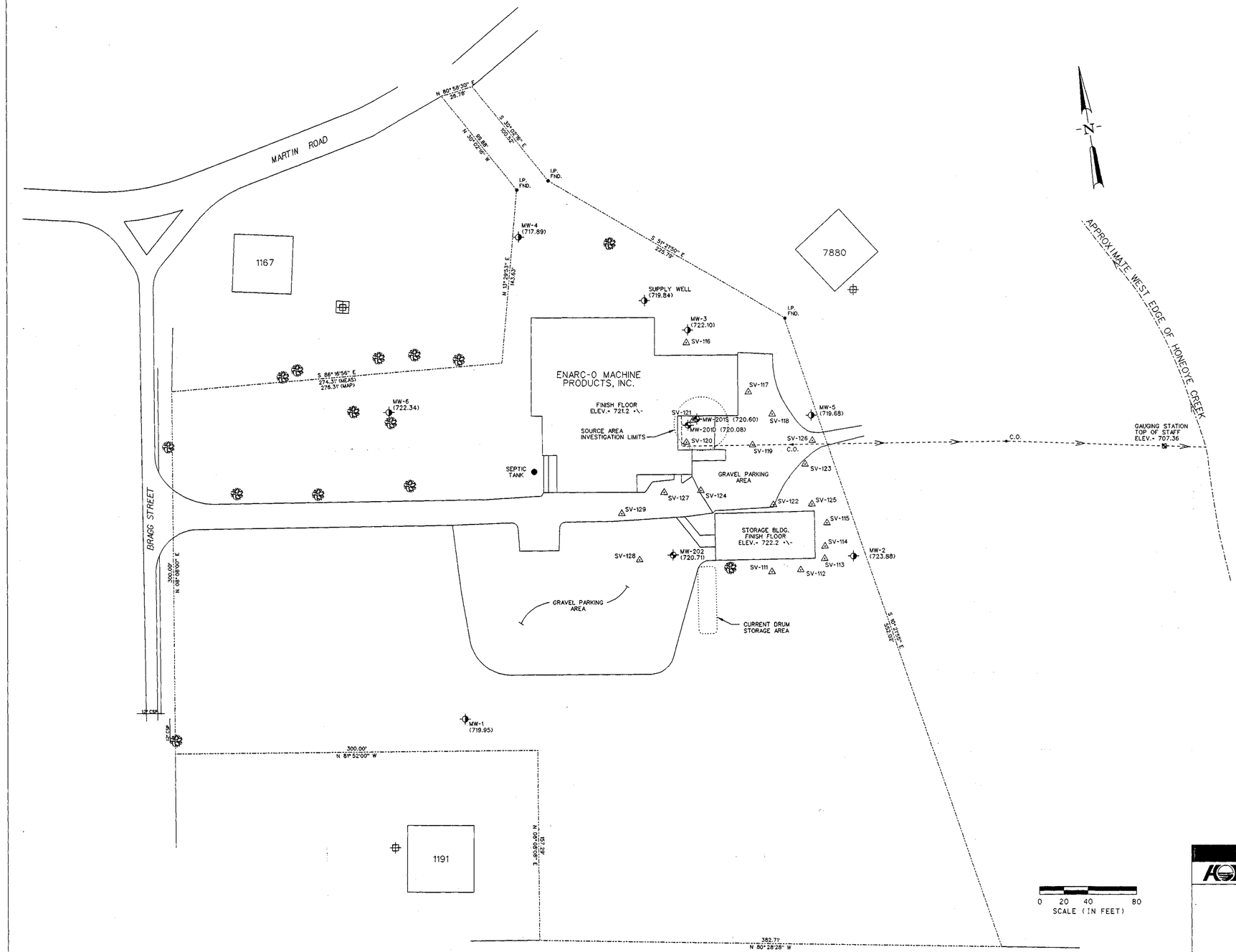
PROPOSED RESIDENTIAL WELL SAMPLING LOCATION PLAN

SCALE: AS SHOWN — MARCH 1995

FILENAME: 70372-042:SAW001D.DGN

FIGURE 2

FILE No. 70372-042



LEGEND:

- RESIDENTIAL WELL
- STREAM STAFF GAUGE LOCATION
- MONITORING WELL INSTALLED BY H&A OF NEW YORK, NUMBER IN PARENTHESES INDICATES TOP OF WELL CASING ELEVATION
- MONITORING WELL INSTALLED BY OTHERS. NUMBER IN PARENTHESES INDICATES TOP OF CASING ELEVATION
- SOIL VAPOR SURVEY LOCATION BY H&A OF NEW YORK
- C.O. SPDES DISCHARGE LINE; C.O. INDICATES CLEAN-OUT LOCATION
- PROPERTY BOUNDARY

NOTES:

1. PLAN ADAPTED FROM SURVEY PERFORMED BY D.J. PARRONE ASSOCIATES COMPLETED ON 11 JUNE 1994.
2. LOCATIONS OF RESIDENCE AT 1167 BRAGG STREET, 7880 MARTIN RD., AND BRAGG/MARTIN RD. JUNCTION ARE APPROXIMATE ONLY, BASED ON AVAILABLE PLANIMETRIC INFORMATION..
3. MONITORING WELLS MW-1 THROUGH MW-6 INSTALLED BY PARRATT-WOLFF INC. DURING NOVEMBER-DECEMBER 1990. MONITORING WELLS MW-201S, 201D AND 202 INSTALLED BY NOTHNAGLE DRILLING COMPANY INC. UNDER H&A OF NEW YORK OBSERVATION DURING THE PERIOD 23 THROUGH 27 MAY 1994.

FILE No. 70372-048

H & A OF NEW YORK

Geotechnical Engineers & Environmental Consultants

ENARC-O MACHINE PRODUCTS, INC.
LIMA, NEW YORK

SITE PLAN

SCALE: AS SHOWN

MARCH 1995

FILENAME: 70372-048:RIS005D.DGN

FIGURE 3

ENARC-O MACHINE PRODUCTS, INC.
LIMA, NEW YORK
REMEDIAL INVESTIGATION QUARTERLY REPORT NO.4

PROJECT SCHEDULE

(revised 3/1/95)

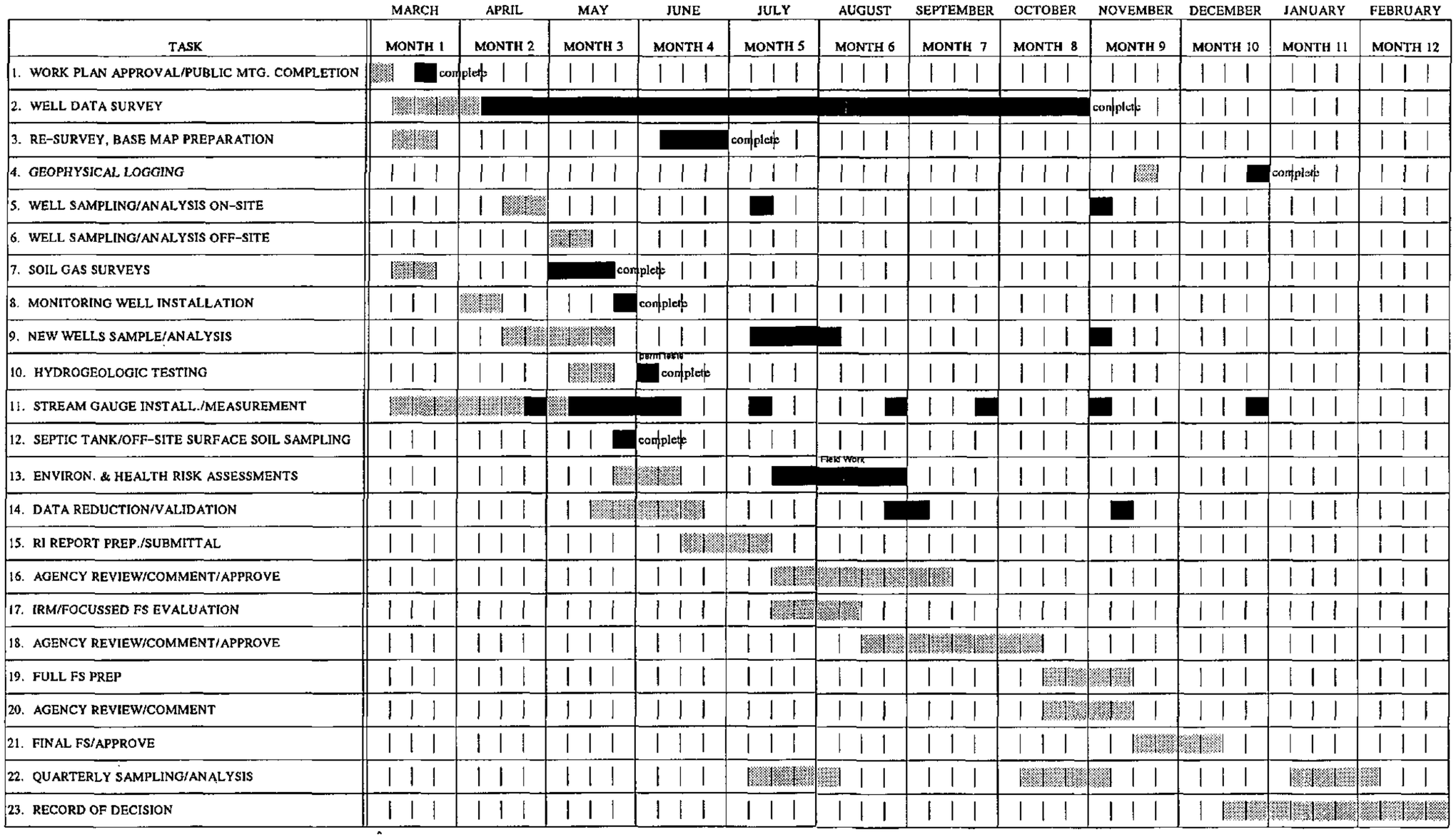


FIGURE 4

rjm-123v24 m:\wks24\70372\qtlyschd

APPENDIX A

H&A Letter Report to NYSDEC

Geophysical Logging Summary

Geotechnical Engineers &
Environmental Consultants

3 February 1994
File No. 70372-42

New York State Department of
Environmental Conservation
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233-7010

Attention: Mr. Gardiner Cross

Subject: Enarc-O Machine Products RI/FS
Lima, New York

Dear Mr. Cross:

This letter summarizes results of recent borehole geophysical investigations performed by H&A of New York (H&A) at the above-referenced site. The investigations were performed in general accordance with methods proposed in H&A's letter to the NYSDEC on 10 October 1994. The geophysical logging was performed in order to gain better understanding of the hydrogeologic conditions in the rock mass in the vicinity of the site, and to determine suitable sampling depths within each well.

I. PROGRAM DESCRIPTION

The five wells logged during the program are shown below, along with their approximate depths:

Well Location	Depth (Feet)
• 1081 Ideson Road (Miller)	82
• 1121 Ideson (Cooper)	120
• 7820 Martin (Johnson)	124
• 7873 Martin (Years)	110
• Enarc-O supply well	185

These wells were chosen based on their spatial distribution and accessibility.

The logging program was performed on 21 and 22 December 1994 by Gartner-Lee Inc. of Niagara Falls, New York under H&A of New York observation.

189 North Water Street
Rochester, NY 14604-1151
Tel: 716/232-7386
Fax: 716/232-6768

Offices
Cambridge, Massachusetts
Denver, Colorado

Glastonbury, Connecticut
Scarborough, Maine
Silver Spring, Maryland

Bedford, New Hampshire
Cleveland, Ohio

Each well was logged for diameter, fluid temperature, and fluid resistivity. In addition, the wells were videotaped with a downhole camera. A malfunction of the equipment rendered a videotape of poor quality that did not yield useful information. However, some notes and observations were made during the videotaping because a proper image was visible at the time of taping. These notes and observations were used in the interpretation of the geophysical data to the extent possible.

The parameters used in the logging were chosen to aid in determining potential zones where inflow of groundwater into the wellbore might be occurring. Identification of such zones would assist in determining the optimum locations for obtaining representative groundwater samples. In addition, the data might indicate potential sitewide features in the rock mass that could be used to determine sampling intervals in non-logged wells.

II. METHODOLOGY

Geophysical Logging Techniques

A Mount Sopris MGX-200 was used to geophysically log the abandoned wells water wells. The Mount Sopris MGX-200 is a digital, computer driven, portable logging device. The unit is equipped with a winch, 650 feet of cable, a laptop computer and console box.

Each geophysical log was referenced to the top of the steel casing for the groundwater monitoring wells. Logging depths were adjusted to compensate for the distance between the top of the casing and the measuring point of a particular logging tool. Each tool was decontaminated with Liquinox detergent and rinsed with potable water at the designated site decontamination area upon completion of data collection at each water well location. Decontamination procedures were followed to help minimize the possibility for cross-contamination of the water wells. The following geophysical logging probes and techniques were utilized at the site:

Fluid Temperature/Fluid Resistivity

Each monitor was initially logged with the combination fluid temperature/fluid resistivity tool to minimize any disturbance to borehole fluid stratification. Data were collected at approximately six feet per minute below the water table. Air temperature data were also collected within the borehole at a rate of seven to eight feet per minute. Temperature data were collected in units of degrees Celsius and fluid resistivity data were collected in units of Ohm-meters.

Fluid temperature and fluid resistivity logs are commonly used to assess the presence of fracture flow and water quality. In a thermally stable borehole, temperature will increase linearly with depth. A non-linear temperature change with depth can indicate the presence of hydrophysical disturbances such as groundwater entering or exiting the borehole through a fracture. Deviations in fluid conductivity values are often due to changes in the amount of total dissolved solids present, electrolytes present and fluid temperature changes. Anomalous values of fluid resistivity can be indicative of fluids with

different chemical or physical properties entering or exiting a borehole when measured in an undisturbed well.

Three-Arm Caliper

A motorized three-arm caliper tool was utilized at this site to measure the borehole smoothness in units of inches. The caliper tool used for this investigation had a diameter of investigation of 2 to 24 inches. Anomalous responses observed with the caliper tool may be indicative of incompetent zones of bedrock, bedrock fractures, bedrock voids or rough areas due to drilling. Caliper data were collected at a rate of approximately eight feet per minute at this site.

Video Inspection Logging

A Marks Products Geovision Borehole Video System was utilized to inspect the boreholes. The Geovision system was equipped with a high resolution solid state color video camera housed in a 0.75-inch outside diameter waterproof case. The system is equipped with 750 feet of PVC coated cable, a digital depth encoder, a PVC borehole centralizer, an active matrix color monitor and an 8-mm VCR.

A power problem with the unit's VCR and color monitoring system resulted in an inability to collect data at the Enarc-O supply well and the water well at 7873 Martin Road. The power problem was thought to have been corrected by the equipment supplier prior to the device's mobilization. The water wells at 1081 Ideson, 1121 Ideson and 7820 Martin roads were inspected with the video system and were reviewed during the taping using the system's color monitor prior to the development of the power problem. Unknown to the on-site geophysicist, faulty video recording heads on the VCR resulted in a very poor quality tape recording. Limited notes recorded during the inspection were used in the interpretation of the geophysical logging data; however, a detailed discussion of the video inspection results are unavailable.

III. WELL SURVEYING

Each of the offsite wells proposed for sampling was surveyed for elevation. The surveying was performed on 22 December 1994 by D.J. Parrone & Associates. Elevations of the top of the well casing were obtained at each well. All elevations are referenced to NGVD Datum.

IV. RESULTS AND DISCUSSION

The results of the logging are discussed below, first on an individual well basis, then with regard to sitewide conditions. Figure 1 shows a graphic representation of each well prepared by Gartner-Lee. Larger scale individual graphic logs for each well are shown as Figures 2 through 6. The water levels

shown on the logs are based on measurements taken on the day the logging was performed. All logs have been corrected to the surveyed casing elevations.

Table 1 summarizes key elevations for each well, and also summarizes H&A's recommended sampling depths for each well, as discussed in detail below.

1081 Ideson Road (Figure 2):

The most significant anomaly was observed in the resistivity log at approximate elevation (el.) 606 to 618 (Figure 2). This zone showed a significant increase in resistivity over the trend observed above this zone. There was also a corresponding caliper anomaly at approximately el. 607 that may represent a bedrock fracture. A caliper anomaly was also observed near the water table at el. 640, with a corresponding minor resistivity anomaly just below this depth. Based on these observations there may be significant flow to the borehole occurring in these zones. Based on these results sampling is proposed at approximate elevations 607 and 640.

1121 Ideson:

Significant flow to the borehole from the unsaturated zone was noted in this well below approximate el. 674. Cascading water was also observed during the videotaping. The cascading water created anomalous resistivity response throughout the interval above the water table, as shown on Figure 3.

Several minor caliper anomalies were observed below the water table in this borehole. In many cases there were minor "spikes" of less resistive water at corresponding elevations. The most notable of these were located at approximate elevations 584, 592, 605, and 611.

Based on these results it is proposed samples be obtained from the perched, cascading water, and from below the water table at el. 605. Analysis of the perched water will provide insight into potential contamination presence in the unsaturated zone. A description of the proposed sampling methodology is included in Appendix A. If a representative sample cannot be obtained, an alternate sample will be obtained from approximate el. 642. The sample at el. 605 will allow comparison with the sample from a similar elevation in the 1081 Ideson Road well, as discussed above.

7820 Martin Road:

Cascading perched water was also observed in this well, although at a much slower rate than that observed in the 1121 Ideson Road well. The water was observed during the videotaping to be flowing from the base of the well casing at el. 680. The fluid resistivity plot indicates relatively stable conditions in the upper 20 feet of the saturated zone, then a sharp decrease in resistivity in the interval from el. 627 to 623 (Figure 4). A corresponding caliper anomaly was also observed in this interval (el. 626), indicating potential fracturing of the rock. A minor decrease in fluid temperature was also noted at el. 626. The binary nature of the resistivity and temperature data may be indicative of

stratification of water in the borehole. The data above el. 623 may indicate a layer of water present from the inflow beneath the casing. This water may be exiting the borehole in the interval near el. 626.

A caliper anomaly was also noted at the base of the well at el. 583, with a corresponding minor anomaly in the resistivity at approximately the same elevation. This may be indicative of groundwater flow to the borehole.

Based on these results, H&A proposes obtaining groundwater samples from the cascading water (if flow is sufficient to obtain a representative sample) and near the bottom of the well at el. 583. If a representative sample of the cascading water cannot be obtained, an alternative sample will be obtained at approximate el. 640.

Enarc-O Supply Well:

A significant anomaly was observed in resistivity readings in the Enarc-O well (Figure 5) in the zone from el. 598 to 588, where resistivity decreased. A minor caliper anomaly was also noted at approximately el. 599, which may indicate fractures through which groundwater flow could occur. A small decrease in temperature also occurred at this interval.

H&A proposes a sample be obtained from approximately el. 598. In addition, a sample from approximately el. 637 (just below the water table). Minor caliper anomalies were noted here, along with a minor variation in the resistivity at this elevation. A sample in this area would be consistent with sampling intervals in the other offsite wells.

7873 Martin Road:

Caliper and resistivity anomalies were noted in the interval from el. 637 to 642, near the water table (Figure 6). Several lesser anomalies were observed below this zone, most notably at an approximate el. 592, where a distinct drop in resistivity was observed.

Based on these results H&A proposes samples be obtained in this well from the zones at elevations 637 and 592.

Sitewide Trends

The geophysical data were reviewed for indications of study-area-wide features or trends in the bedrock or groundwater that would aid in determining optimum sampling depths in unlogged wells. In general, none of the logging parameters appear to delineate specific zones of bedrock fracturing or ground water flow that are common to all wells logged.

Flow from the unsaturated zone was noted in only two of the five wells logged. The perched water observed in these wells may be a result of connection through fractures to the Honeoye Creek streambed. The wells are located approximately 250 ft. (1121 Ideson Rd.) and 900 ft. (7820 Martin Rd.) from the stream.

The caliper data indicate significant variation in caliper anomalies among the logged wells. The majority of the "spikes" in the caliper plots likely represent bedding planes in the rock formation and may not necessarily be fractures through which groundwater flow can occur. There were no specific zones or elevations where significant caliper anomalies were observed in all logged wells across the study area.

Fluid temperature measurements ranged from approximately 8° to 10.1°C. In most of the wells the fluid temperature remained relatively constant throughout the borehole, with minor variations. The well at 1081 Ideson Road showed the warmest near-surface water (approximately 10.1°C) and gradually decreased throughout the borehole with depth.

Fluid resistivity showed significant sitewide variation, ranging from approximately 10 to 23.5 ohm-meters (ohm-m). The well at 1081 Ideson Road had the highest resistivity values, ranging from approximately 20.5 to 23.5 ohm-m. This may be related to the relatively high temperatures observed in this well. The well at 7873 Martin Road showed the lowest resistivity values, averaging approximately 10 ohm-m. The remainder of the wells showed values between approximately 11.5 to 17 ohm-m. These results indicate variation in the total dissolved solids concentration in groundwater across the site and may be indicative of a variation in the source of groundwater flowing to individual wells.

Proposed Sampling in Unlogged Wells

The proposed sampling intervals for the geophysically-logged wells were discussed above and summarized in Table 1. As discussed above, distinct features or trends in bedrock or groundwater conditions across the study area were not apparent from the geophysical data. However, the intervals to be sampled in the unlogged wells can be approximated to provide reasonable data on the distribution of contaminants in groundwater.

The sample locations proposed for the logged wells generally fall into three intervals:

- perched water in the unsaturated zone, where present;
- shallow samples at or near the water table, approximately el. 635 to el. 640; and
- deeper samples in the interval from el. 582 to el. 612 where the apparent flow zones have been indicated.

The deepest proposed sample in the Enarc-O supply well does not correlate to other proposed sample intervals in the study area since the well is much deeper than the other wells.

These data indicate two primary zones that should be considered in the unlogged wells when choosing sampling intervals. The first would be shallow, within approximately five feet of the water table, or approximately el. 640. The second would be approximately el. 600. Obtaining data from similar elevations across the study area will allow reasonable comparison of data among wells and should provide an indication of vertical distribution of contaminants in groundwater. If flow from the unsaturated zone is encountered in any of the wells, a sample of this water could be substituted for the shallow water table sample. Table 1 summarizes proposed sampling elevations for the logged and unlogged wells.

We look forward to your response and authorization to proceed with the offsite sampling program as soon as possible. If you need additional information please do not hesitate to contact us.

Sincerely yours,
H&A OF NEW YORK

Robert J. Mahoney
Senior Environ. Geologist

Vincent B. Dick
Vice President

RJM/rjm:70372-42\lcross.wp

c: Ronald Iannucci, Sr., Kaddis Manufacturing
William Helferich III, Harter Secrest
David Napier, NYSDOH
Ralph Van Houten, LCDOH

Attachments
Table 1 - Proposed Sampling of Offsite Residential Wells
Figure 1 - Schematic Geophysical Logging Diagram
Figures 2 through 6 - Individual Geophysical Well Logs
Appendix A - Methodology for Sampling Cascading Water in the Unsaturated Zone

ENARC–O MACHINE PRODUCTS, INC.
LIMA, NEW YORK

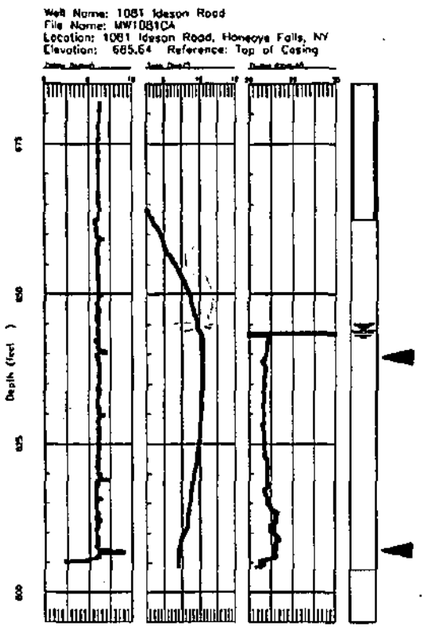
TABLE 1
PROPOSED GROUNDWATER SAMPLE LOCATIONS
OFFSITE RESIDENTIAL WELLS

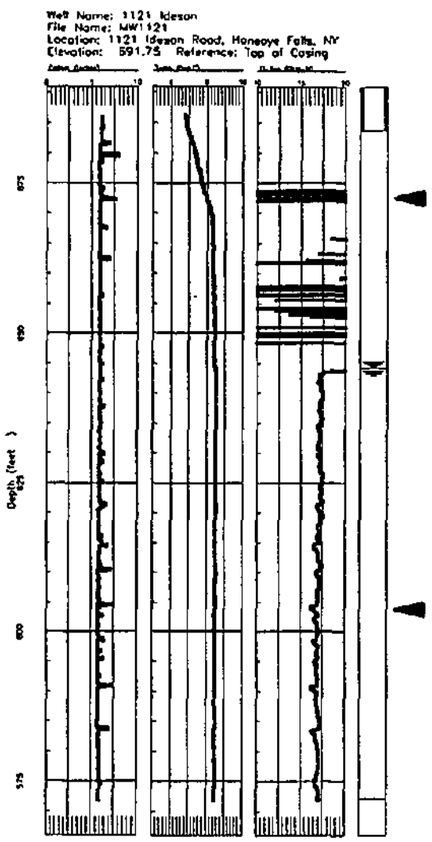
ADDRESS (OWNER)	WELL ELEVATIONS (ft.) TOP OF CASING	BOTTOM OF CASING	APPROX. WELL BOTTOM	WATER LEVEL*	PROPOSED SAMPLING ELEVATION(S) (APPROX.)
LOGGED WELLS:					
1081 Ideson (Miller)	685.64	672.5	603	643.96	640; 607
1121 Ideson (Cooper)	691.75	684	572	644.06	675 (cascading water); 605
7820 Martin (Johnson)	704.15	680	580	643.82	680 (cascading water); 583
Enarc–O Supply Well	719.88	687	535	643.17	637; 598
7873 Martin (Years)	693.61	687 / 709	585	644.43	637; 592
UNLOGGED WELLS:					
1090 Ideson	697.44	unknown	574	643.90	640; 600
1116 Ideson	697.92	unknown	572	643.98	640; 600
1146 Ideson	703.46	unknown	578	643.88	640; 600
7852 Martin	713.79	unknown	573	689.08	640; 600
7880 Martin	707.93	unknown	unknown	643.39	640; 600
1167 Bragg	715.3	unknown	584	643.66	640; 600
1191 Bragg	714.32	unknown	637	692.09	640; 600

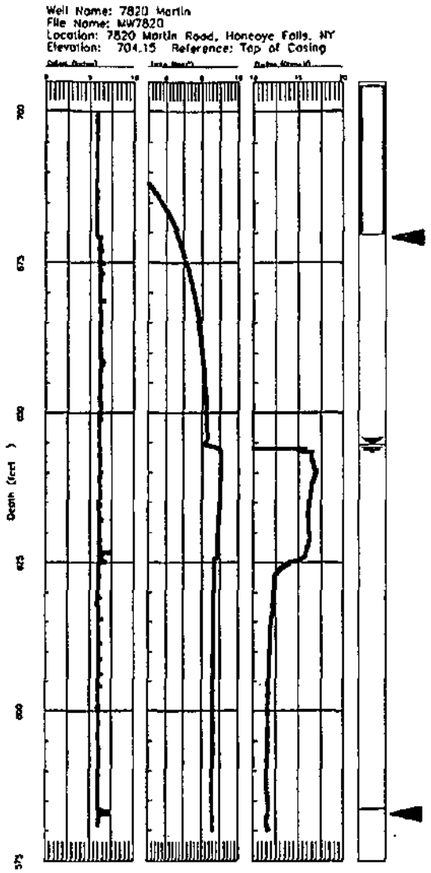
NOTES:

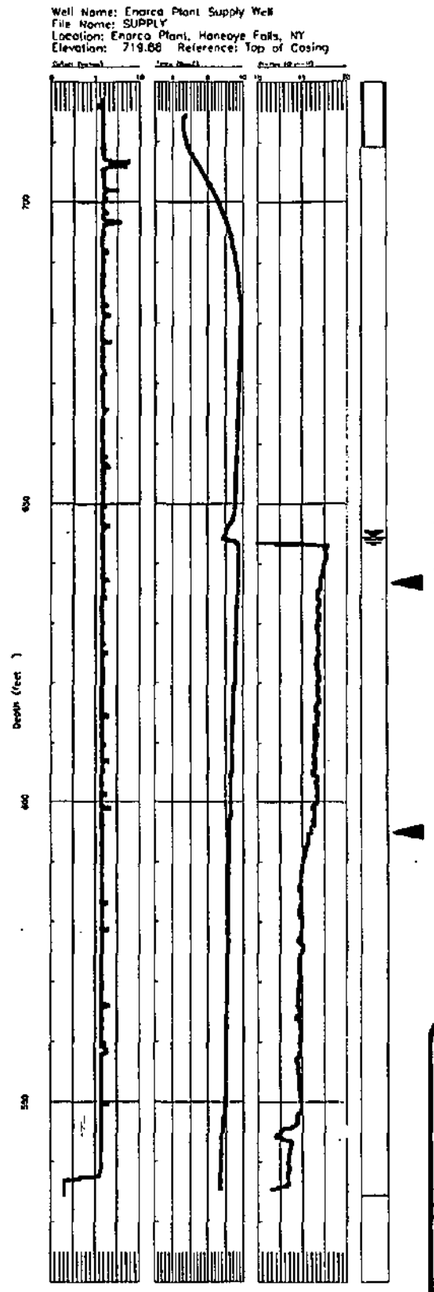
1. Top of casing elevations surveyed by D.J.Parrone on 22 December 1994.
2. Refer to text for discussion of proposed sampling elevations.
3. * – water levels measured on 22 December 1994.

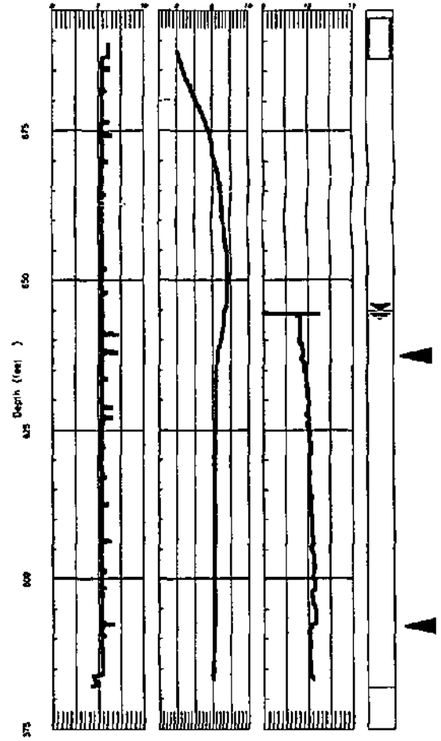
RJM – M:\WKS2\970072\WELLSAMP
REV. 1/23/95











LEGEND:

◄ PROPOSED LOCATION OF GROUNDWATER SAMPLE

NOTES:

1. PROPOSED GROUNDWATER SAMPLE LOCATIONS ADDED BY H&A OF NEW YORK
2. SEE ACCOMPANYING REPORT FOR DISCUSSION OF LOGGING RESULTS

GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

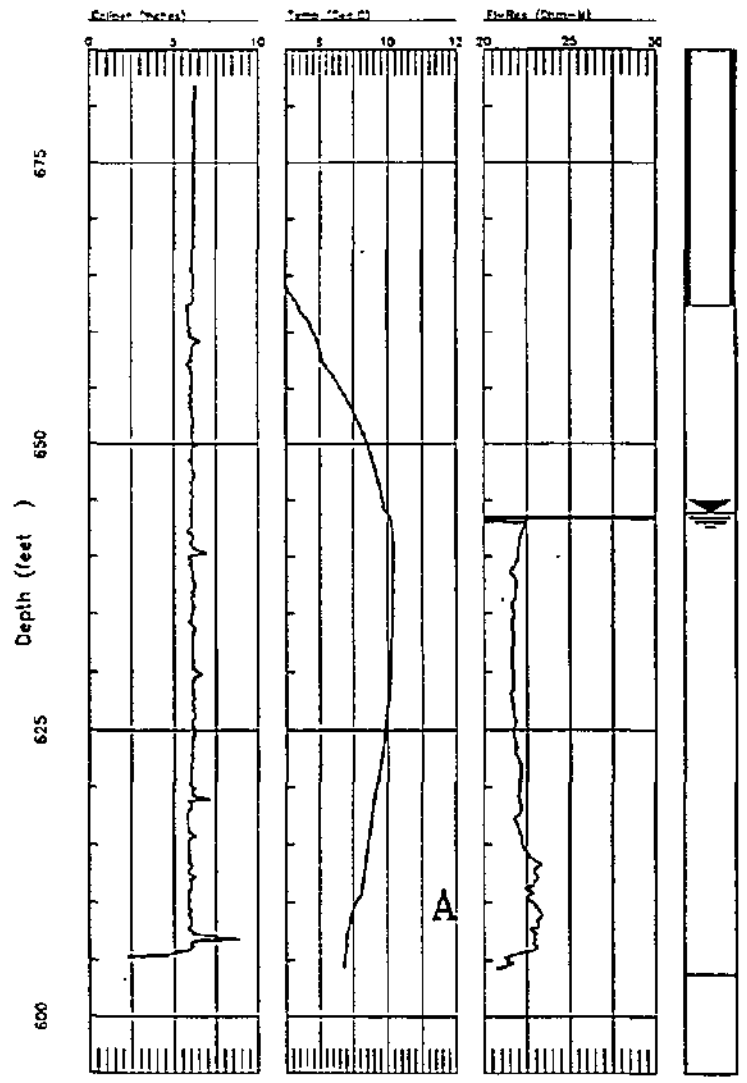
DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS OF WATER WELLS IN THE VICINITY OF THE ENARCO PLANT

PROJECT No: 94-841 DATE: DECEMBER 1994 FILENAME: IDESON.GCD

Gartner Lee
Niagara Falls, NY

FIGURE
1

Well Name: 1081 Ideson Road
File Name: MW1081CA
Location: 1081 Ideson Road, Honeoye Falls, NY
Elevation: 685.64 Reference: Top of Casing



GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

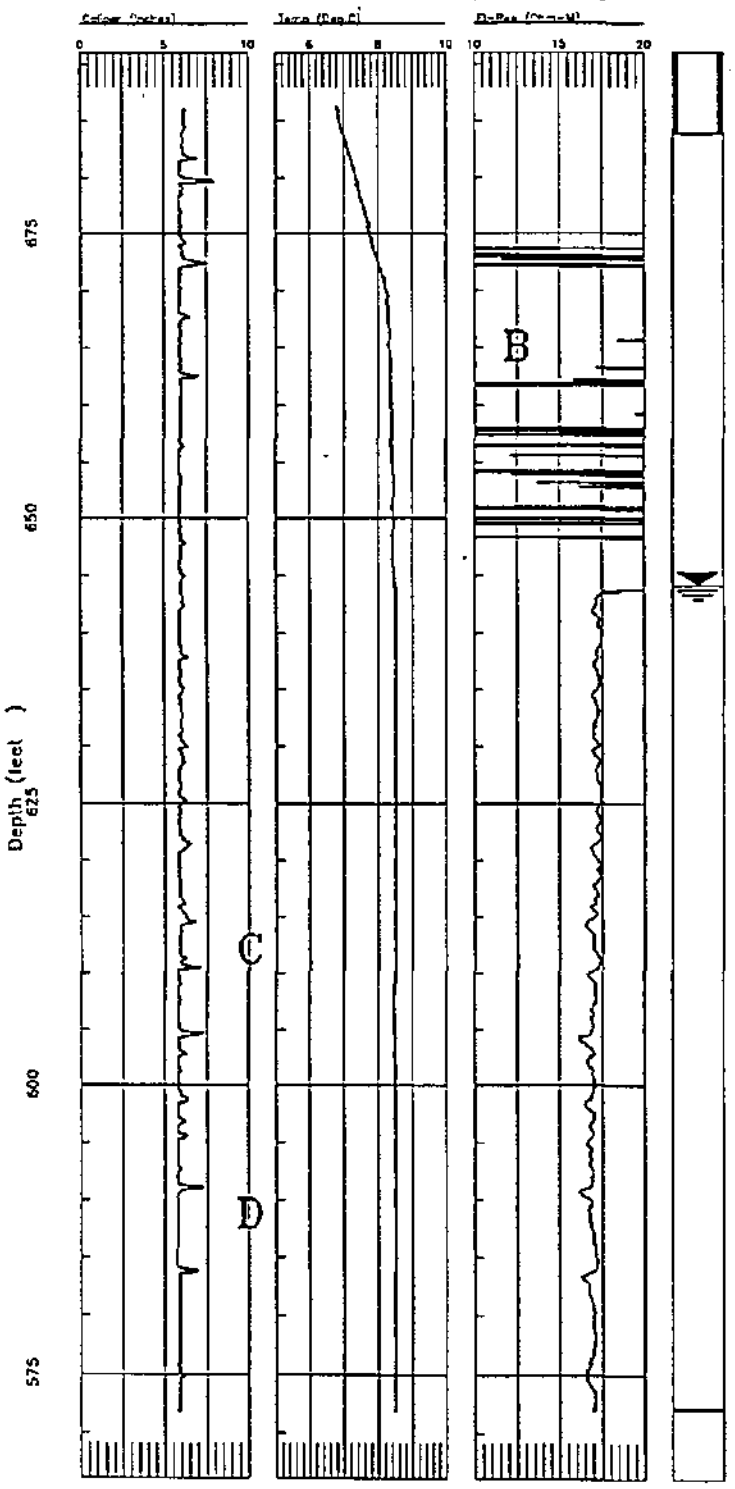
DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS FROM A WATER WELL AT 1081 IDESON ROAD

PROJECT No. 94-641 DATE: DECEMBER 1994 FILENAME: FIG1.DGD

Gartner Lee
Niagara Falls, NY

FIGURE
2

Well Name: 1121 Ideson
File Name: MW1121
Location: 1121 Ideson Road, Honeoye Falls, NY
Elevation: 691.75 Reference: Top of Casing



GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

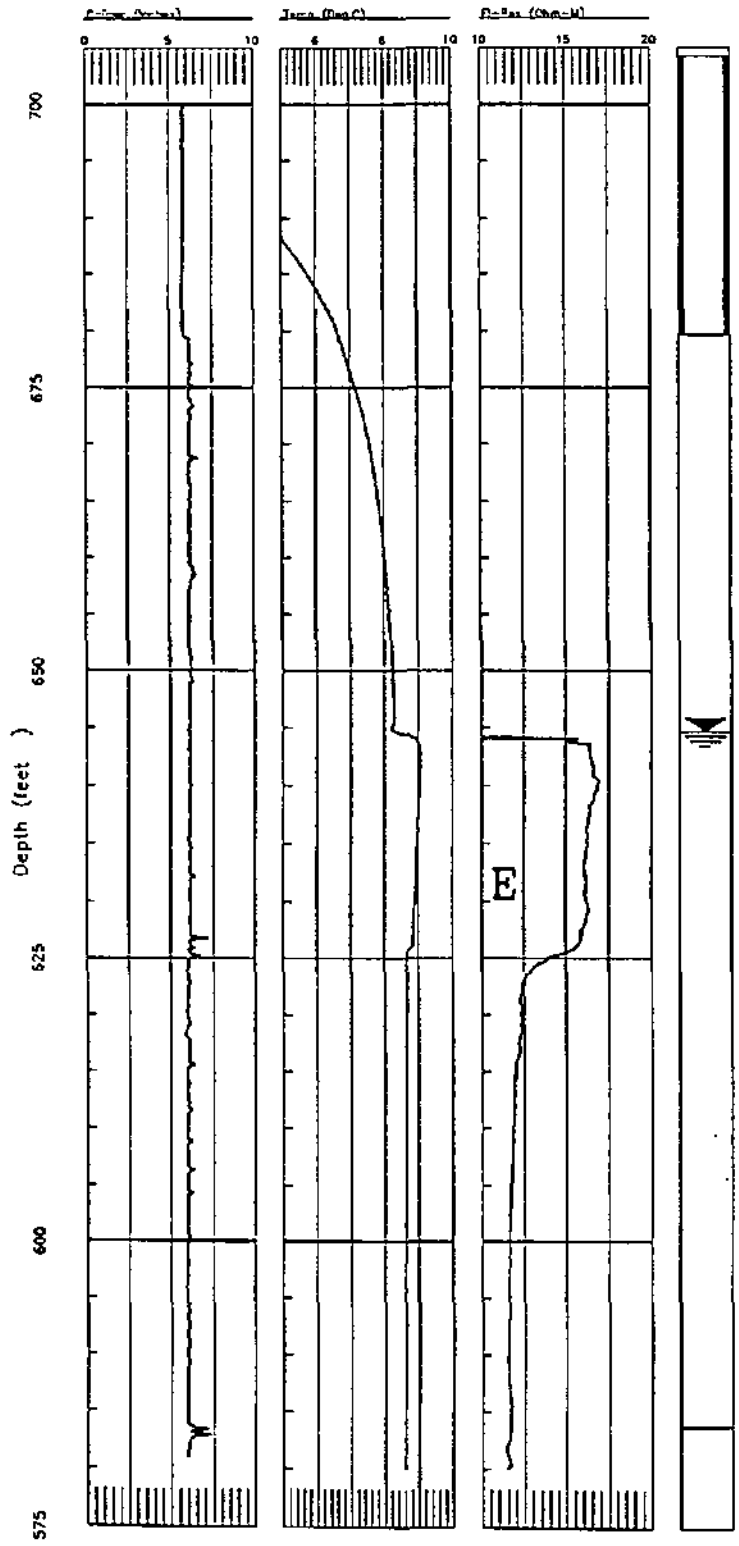
DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS FROM A WATER WELL AT 1121 IDESON ROAD

PROJECT No: 94-64 DATE: DECEMBER 1994 FILENAME: FIG1GCD

Gartner Lee
Niagara Falls, NY

FIGURE 3

Well Name: 7820 Martin
File Name: MW7820
Location: 7820 Martin Road, Honeoye Falls, NY
Elevation: 704.15 Reference: Top of Casing



GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

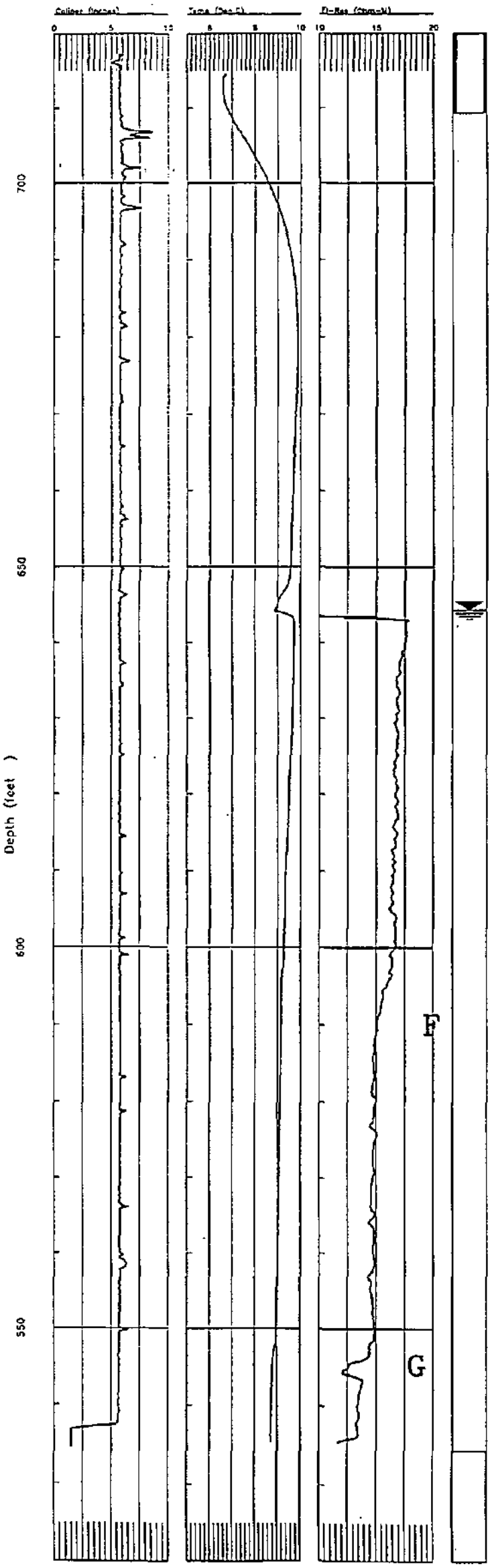
DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS FROM A WATER WELL AT 7820 MARTIN ROAD

PROJECT No: 84-04 DATE: DECEMBER 1984 FILENAME: FIG4DCD

Cartner Lee
Niagara Falls, NY

FIGURE
4

Well Name: Enarco Plant Supply Well
File Name: SUPPLY
Location: Enarco Plant, Honeoye Falls, NY
Elevation: 719.88 Reference: Top of Casing



GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

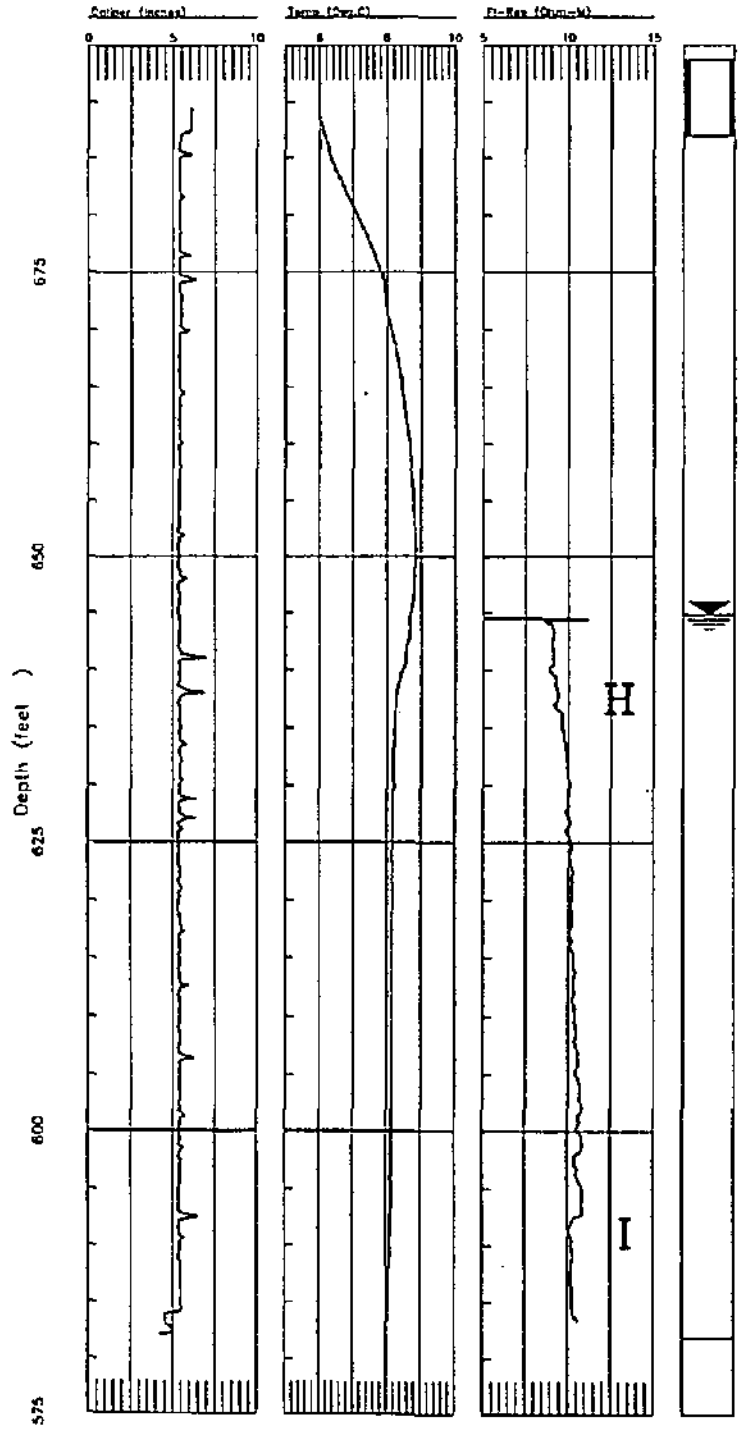
DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS FROM A SUPPLY WELL AT THE ENARCO PLANT

PROJECT No: 94-44 DATE: DECEMBER 1994 FILENAME: FIG5CCD

Cartner Lee
Niagara Falls, NY

FIGURE
5

Well Name: 7873 Martin
File Name: MW7873.HDR
Location: 7873 Martin Road, Honeoye Falls, NY
Elevation: 693.61 Reference: Top of Casing



GEOPHYSICAL LOGGING RESULTS

ENARCO PLANT, HONEOYE FALLS, NY

DRAWING SHOWING RESPONSES OF CALIPER, TEMPERATURE AND FLUID RESISTIVITY TOOLS FROM A WATER WELL AT 7873 MARTIN ROAD

PROJECT No: 94-66 DATE: DECEMBER 1994 FILENAME: FIG6OCD

Gartner Lee
Niagara Falls, NY

FIGURE
6

APPENDIX A

Methodology for Sampling Cascading Water in the Unsaturated Zone

APPENDIX A

Methodology for Sampling Cascading Water in the Unsaturated Zone

As discussed in the accompanying report, "cascading water" was encountered in two of the offsite residential wells during the geophysical logging program. H&A of New York has proposed obtaining samples of the perched water flowing to these boreholes from the unsaturated zone in bedrock.

In order to obtain samples of this water, H&A proposes to suspend a bailer or other open-top container into the well to the depth where inflow is occurring. In the case of the well at 1121 Ideson Road significant inflow was observed during the borehole videotaping. The flow was such that a bailer suspended in the zone of flow could be expected to retrieve a sufficient volume of water to perform the required laboratory analyses. The water would be transferred from the bailer to 40-ml glass vials immediately upon retrieval from the well.

In the case of the well at 7820 Martin Road, the flow to the borehole was slower than in the well at 1121 Ideson Road. The water was seen during the videotaping to seep from beneath the bottom of the well casing. H&A proposes to sample this well in a manner similar to the 1121 Ideson well, however it may be necessary to construct a sampling device that will divert the seepage water from the borehole wall into a sample container. A funnel-like device held against the borehole wall with a sufficient length of rigid pipe should suffice.

In both cases, the water obtained from the borehole will be transferred to glass sample vials in a manner that minimizes the loss of volatile organic compounds.

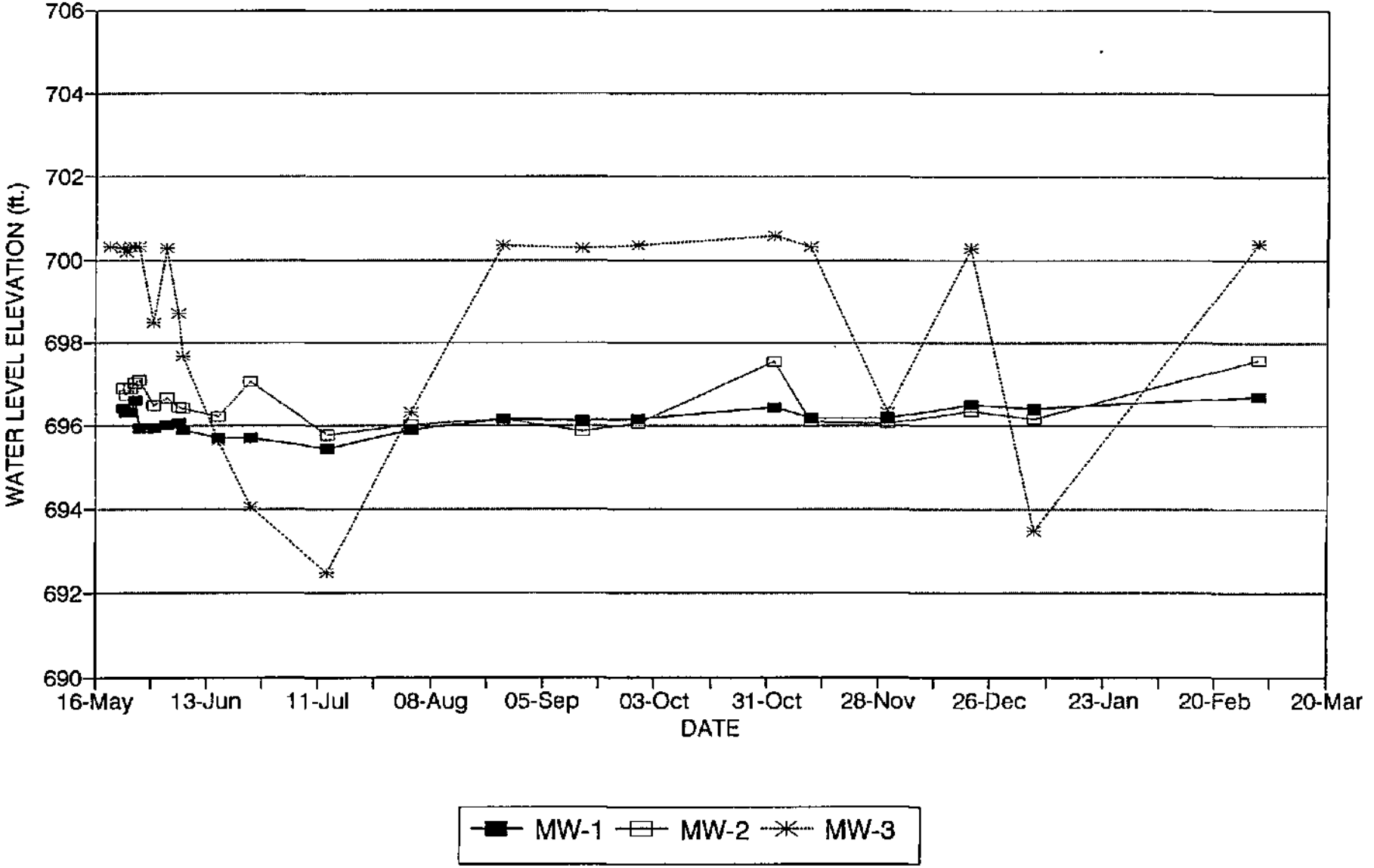
Appendix B

Appendix B

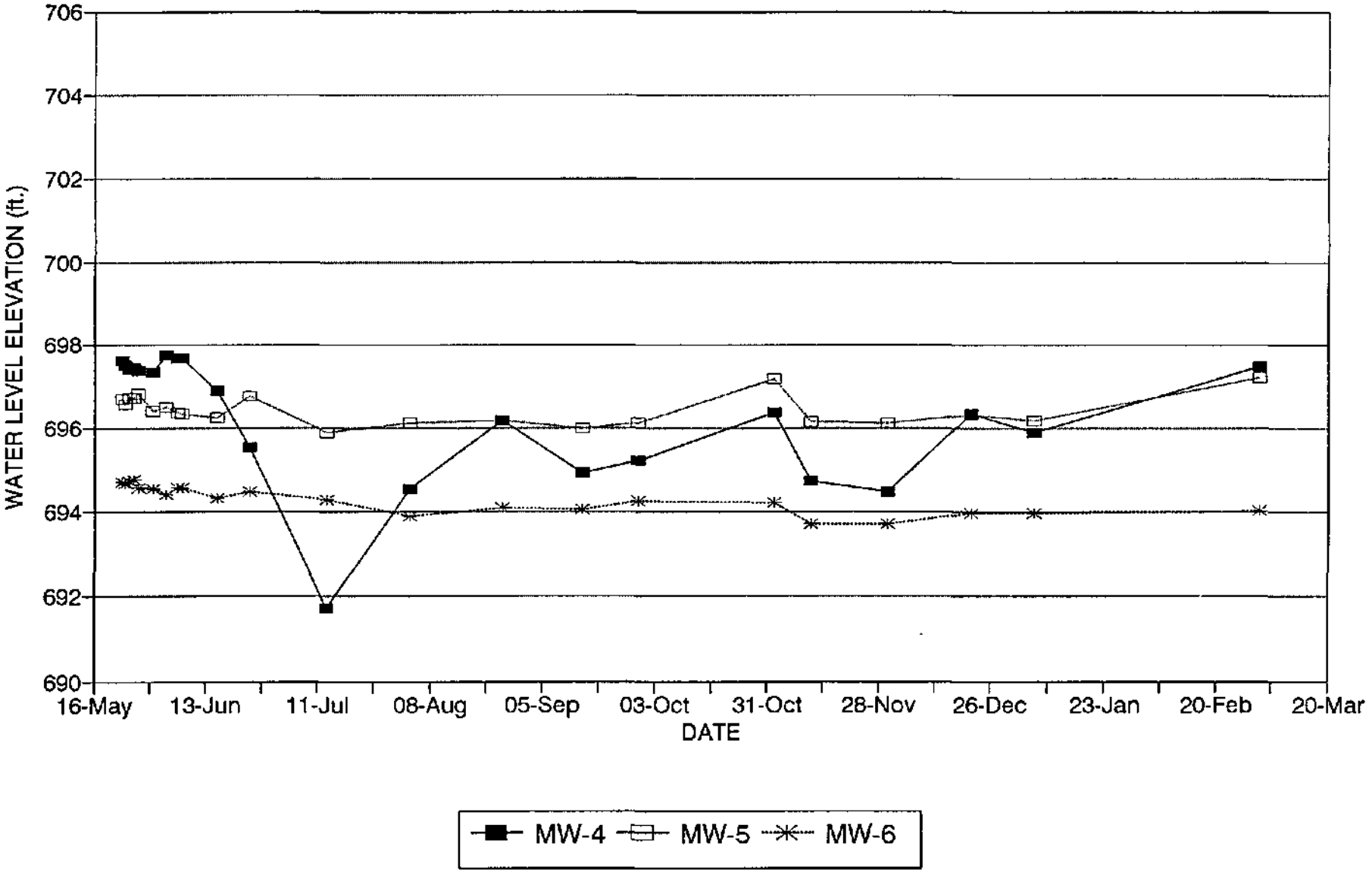
APPENDIX B

Hydrographs for Honeoye Creek and On-site Monitoring Wells

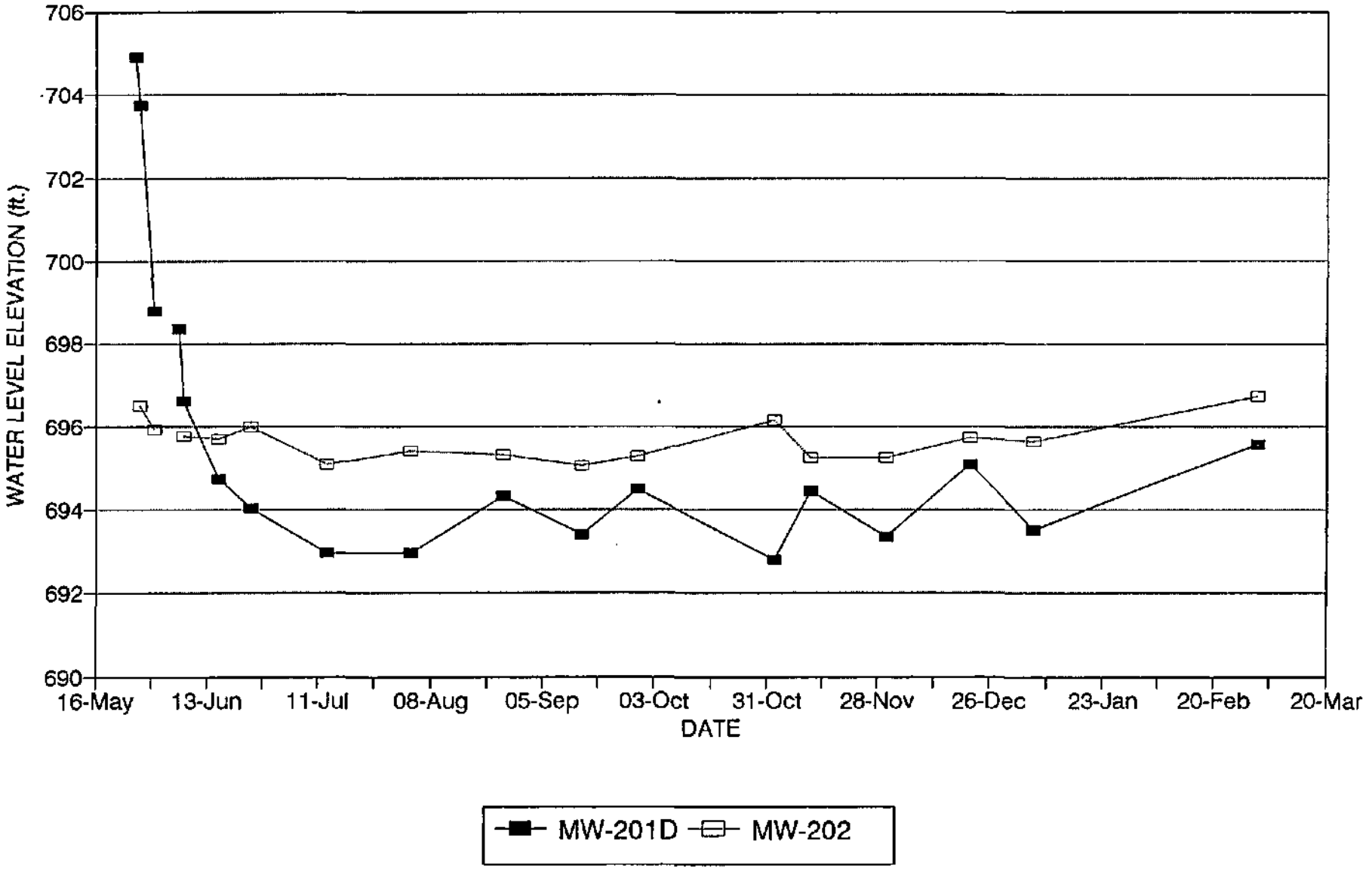
WELL HYDROGRAPHS
ENARC-O MACHINE PRODUCTS



WELL HYDROGRAPHS
ENARC-O MACHINE PRODUCTS



WELL HYDROGRAPHS
ENARC-O MACHINE PRODUCTS



WELL HYDROGRAPHS
ENARC-O MACHINE PRODUCTS