

160 N. WASHINGTON STREET, SUITE 400, BOSTON, MA 02114

TECHLAW INC.

PHONE: (617) 720-0320
FAX: (617) 720-0321

RZ1-R01062.01-FD-049

April 9, 1998

Ms. Rosanne Sawaya-O'Brien
Regional Project Officer
U.S. EPA New England
Waste Management Division (HPC CAN-7)
JFK Federal Building
Boston, MA 02203

Reference: EPA Contract No. 68-W4-0013; EPA Work Assignment No. R01062;
Environmental Indicators Team Support; Final Environmental Indicators
Report, Tasks 04 and 05

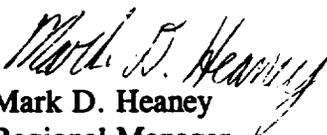
Dear Ms. Sawaya-O'Brien:

Enclosed please find the Final Environmental Indicator Report for the Reliable Electroplating, Inc. site. The draft report was written based upon reference material collected during file search activities and contacts with regulatory and local representatives familiar with the site. The final report was revised by TechLaw, Inc. based upon written comments and additional reference material received from Mr. Frank Battaglia of EPA New England. A complete copy of the report has been submitted to Work Assignment Manager, Mr. Ernie Waterman.

Enclosed for your convenience is a hard copy of the report and an electronic version on 3.5-inch diskette formatted in WordPerfect 6.1.

Please contact me or the TechLaw WAM, Mr. Michael McGeehan, at (617) 720-0320 x111, if you have any questions.

Sincerely,


Mark D. Heaney
Regional Manager

cc: E. Waterman, EPA New England w/diskette
W. Jordan/Central Files
T. Penhale



Reliable Electroplating, Inc.
EPA I.D. No. MAD001209121

I. Introduction

The Reliable Electroplating, Inc. facility (Reliable) is located on 304 West Main Street in Chartley, Massachusetts. The site houses a factory and garage. The buildings and an asphalt paved area are located on the western side of the site. The Wastewater Treatment Lagoons (lagoons) and the Drainage Trench are located on the eastern side of the site. The site is bordered to the north by West Main Street (Route 123), to the east by a paved driveway and the Wading River, to the south by Chartley Brook (also known as the Stoney Brook), and to the west by a residential property. A school is located approximately 1,200 feet northwest of the site. A summer camp, Camp Finberg, is located 1,300 feet north of the site on the eastern side of Wading River. A golf course is located south of the site on the opposite side of Chartley Brook. Three unnamed ponds are located within 1 mile of the site and non-forested wetlands are located within a 0.5 mile radius of the site. A topographic map and a site map have been attached (Attachments A and B) to the report for reference. According to a phone conversation between A.T. Kearney (now TechLaw, Inc.) and Mr. Ralph Fine of MADEP, on September 8, 1997, a dam and other industrial facilities are located upstream of the Reliable facility. Site groundwater flows in a south-southwesterly direction toward Chartley Brook. A site map showing groundwater flow has also been attached (Attachment C). There are no private drinking water wells being used within a 0.5 mile radius of the site. Residents are serviced by the City of Norton water supply which does not accept groundwater or water from the Wading River or Chartley Brook (References: 7, 16, 33, 38, 39).

Reliable is a plating shop serving local manufacturers of jewelry, electronic components, and machine parts. On-site plating operations involve rack or barrel type plating using six types of plating solutions: copper, gold, nickel, rhodium, silver or tin. The plating process includes putting the pieces on racks or in barrels for electroplating, degreasing the pieces with trichloroethylene, cleaning in alkaline cleaners, rinsing and drying. The wastes generated from these processes include metal hydroxide sludge (F006), waste trichloroethylene, waste rinse waters, waste alkaline cleaners, waste sodium cyanide, and waste acids (hydrochloric, sulfuric, nitric) (References: 7, 9, 10, 11, 12, 16, 33).

Available references indicate that sometime between 1965 and 1970 until 1985 the rinse waters generated from the plating processes were discharged to two unlined lagoons (also identified as surface impoundments) where the metal sludges were settled out prior to the water being discharged into the Chartley Brook. The lagoons measured 40 feet long by 35 feet wide and 80 feet long by 40 feet wide, respectively. Discharge from the lagoons occurred through a four-inch diameter pipe into Chartley Brook. An unlined sludge trench measuring about 110 feet long by 5 feet wide by 3 feet deep was located on the north side of the lagoons. The sludge trench was used to periodically store sludge from the lagoons prior to the sludge being

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removed for off-site disposal. As of December 30, 1985 the facility discontinued use of the lagoons and sludge trench. Currently, the rinsewaters are discharged to a continuous flow wastewater treatment unit at a rate of up to 6,000 gallons per day. Treatment consists of cyanide destruction and pH adjustment. The resulting metal hydroxide sludge is precipitated and removed off-site to a RCRA hazardous waste facility. The rinsewater is discharged into the Chartley Brook under NPDES permit number MA004600. A hazardous waste storage area is located on the southeast corner of the facility in a fence-enclosed porch type structure. Wastes are stored in five and 55-gallon drums in this area for less than 90 days and shipped off-site for disposal. The actual size of the hazardous waste storage area, years of operation, or information concerning its condition was not provided in the available reference material, however an inspection report dated June 19, 1985 stated that there was no evidence of leakage or spillage at the unit (References: 3, 7, 14, 15, 16, 23, 24, 29, 33).

The site is underlain by Rhode Island Formation bedrock at an elevation of approximately 80 to 90 feet above mean sea level (msl). This formation is overlain by stratified beds and lenses of well sorted, fine to coarse sand, with beds of gravel, silt, and clay. Silty peat layers ranging from 0.5 feet up to 2.0 feet thick occur below the fill layer along the northern edge of Chartley Brook. Below the sand and gravel layer is a clay and silt unit approximately 3.5 feet thick. Bedrock is encountered at approximately 24.7 feet below the ground surface. The regional hydrogeology is dominated by 15 to 30 feet of saturated sands and gravels. Chartley Brook flows into the Wading River approximately 50 feet east of the site. Wading River flows easterly and enters Three Mile River about 2.9 miles east of the site. The site is located in the Taunton River Drainage Basin. According to reference number 33, there are no interim wellhead protection areas or areas of critical environmental concern within a 0.5 mile radius of the site. However, according to reference number 13, the site is located in a Buffer Zone and Wetland Resource Area (References: 13, 33).

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II. Summary of Releases

Date of Release	Description of Release
About 1965 to 1985	<p><u>Wastewater Treatment Lagoons and Sludge Trench.</u> The unit consisted of two unlined surface impoundment measuring 40 feet long by 35 feet wide and 80 feet long by 40 feet wide respectively, and one unlined sludge trench measuring 110 feet long by 5 feet wide by 3 feet deep. The lagoons were designed for the destruction of cyanide and precipitation of heavy metals, primarily nickel. The discharge to the lagoons has been estimated at 5,000 gallons/day. Since the lagoons were designed to percolate/infiltrate liquid into the ground, by virtue of their design, a release of hazardous constituents to soil and groundwater occurred. During one site inspection of the facility, a blue green sludge was said to have accumulated in the lagoons however, no evidence of leachate breakout or distressed vegetation was noted. Analytical results of four soil samples collected at a depth of six inches in the sludge trench as part of Phase I Closure Plan activities indicated that none of the samples exhibited EP toxicity characteristics. However, elevated concentrations of total metals such as copper (930 mg/kg), nickel (1,720 mg/kg) and zinc (260 mg/kg) were present. Historic groundwater monitoring conducted since 1982 has indicated statistically significant changes in groundwater quality for VOCs and metals. Groundwater monitoring has identified trichloroethylene (TCE), 1,2-dichloroethylene (1,2 DCE), vinyl chloride (VC), and nickel at concentrations exceeding Massachusetts Maximum Contaminant Levels (MMCLs). The most recently available groundwater monitoring data (April 25, 1996) indicates regulatory exceedances for TCE (9.1 ug/l), VC (3.4 ug/l), and nickel (1.1 mg/l). A plume of contamination has been identified as moving south/southwest toward the Wading River. Although the level of groundwater contamination has reportedly decreased for most contaminants over the years, TCE, 1,2-DCE, VC and nickel have persistently exceeded the MMCLs at several monitoring wells. The most impacted groundwater occurs in shallow overburden well OW-2 located downgradient of the closed surface impoundments. No contamination has been identified in the deep overburden well, WS-1 located adjacent to OW-2. In addition, 1,1,1-trichloroethane (1,1,1 TCA) has also been identified above MMCLs in OW-2. However, according to the facility and MADEP, this contamination may be coming from an industry source located upstream of the Reliable facility (References: 2, 4, 7, 16, 17, 18, 21, 22, 23, 33, 38).</p>

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III. Summary of Interim Measure

Dates Conducted	Description of Interim Measures
1984 - 1995	<p><u>Wastewater Treatment Lagoons and Sludge Trench.</u> Reliable submitted a Closure Plan for the lagoons and sludge trench in December 1985. The plan was revised in April 1987 and approved by MADEP on August 13, 1990. Closure activities included excavation and removal of 105.5 tons of metal hydroxide sludge and soil from the sludge trench in June 1984. Lime was added to the sludge trench until it reached a pH of 7 to 7.5 and then the trench was backfilled. Following installation and start-up of the new wastewater treatment system, closure of the wastewater treatment lagoons was implemented. Sludge from the lagoons was dewatered in a mobile filter press and drummed for off-site disposal. The filtrate was processed through the wastewater treatment system prior to NPDES discharge into the Chartley River. A total of 9,250 gallons of metal hydroxide sludge and 303 cubic yards of contaminated soil were removed from the lagoons and trench. Backfilling of the units was conducted between September 18, 1991 and October 18, 1991. A total of 57 tons of lime was placed in the lagoons and trench to a depth of about six inches. In addition, 475 cubic yards of clean fill consisting of coarse gravel, 255 cubic yards of stable dense fill and 325 cubic yards of low permeable clay were placed in the lagoons and trench. To prevent erosion 255 cubic yards of screened loam and seeding was placed on top of the lagoons and trench. The two lagoons and trench are enclosed within an eight-foot chainlink fence on three sides and bordered by the Chartley Brook on the fourth side. RCRA Post-Closure requirements consist of sampling four groundwater monitoring wells and collecting sediment and surface water samples on a semi-annual basis (References 4, 6, 12, 13, 14, 15, 23, 24, 29, 30, 32, 36, 39).</p>

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IV. Human Exposures Controlled (CA725) Determination and Recommended Action

Human Exposure Controlled (CA725)

Based on the information contained in the references reviewed, including groundwater monitoring results, the site operations and environmental setting (physical and demographic), it is suggested that Reliable Electroplating, Inc., can be classified as a site where human exposures are controlled (YE determination). Based upon guidance specified in the July 29, 1994 U.S. EPA "RCRIS Corrective Action Environmental Indicator Event Codes" memorandum (Guidance), one of the following two criteria must be met for a YE determination. These are:

1. Remedial measures have been implemented with the result that all maximum contaminant concentrations detected or reasonably suspected are less than or equal to their respective action levels (e.g., MCLs for groundwater, a 1×10^{-6} risk level for other contaminants, or any other number designated as the action level) or do not exceed Agency specified cleanup standard for the facility, and/or
2. There is no unacceptable human exposure to any contaminant concentration above action levels that has been detected or is reasonably suspected based on current contaminant concentrations and current site conditions. Although contamination remains at the facility that may require further remediation, action has been taken or site conditions are otherwise such that unacceptable threats to human health from actual exposure to the contamination are not plausible based on current uses of the site. Such actions may include the use of physical barriers or institutional controls (e.g., deed restrictions or alternative water supply).

Reliable Electroplating, Inc. does not meet the first criterion since groundwater monitoring indicates that contamination is present in groundwater beneath the site at levels exceeding MMCLs. However, Reliable Electroplating, Inc. does meet the second criterion due to the fact that no foreseeable human exposures to contaminated groundwater and surface water were identified. As a result, the YE determination status can be given to this facility. Additional details regarding the decision-making behind the YE determination are described below in the Groundwater and Surface Water sections.

Groundwater - In December 1982, three groundwater monitoring wells (OW-1, OW-2, OW-3) were installed on the site. Groundwater samples collected from these wells between 1982 and 1984 contained non-detectable to very low concentrations of contaminants such as chlorinated solvents and nickel. As part of the lagoon closure activities, a fourth well (OW-4) was installed in 1986. Groundwater monitoring was and continues to be conducted on a semi-annual basis. Groundwater sampling results from 1989 to 1993 indicate that the groundwater was impacted by

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several volatile organic compounds (VOCs) and metals. The most frequently detected contaminants have been trichloroethylene (TCE) and 1,2 dichloroethylene (1,2-DCE) and nickel. Vinyl chloride (VC), tetrachloroethylene (PCE), and 1,1,1-trichloroethane (TCA) were also identified but less often and at lower concentrations. TCE, VC, PCE and nickel results have exceeded current MMCLs. The most impacted groundwater has occurred in the shallow observation well OW-2 located downgradient of the former surface impoundments. No contamination has been identified in the deep overburden well WS-1 located adjacent to OW-2. Presence of TCA was found for the first time during the September 1990 semi-annual analysis. Reliable stated that this compound was not used in the past nor is it being used presently at the facility. According to MADEP, the TCA may be the result of industry discharges occurring upgradient. However, a full assessment of total industry impacts in the area has not been performed. Available references indicate that on July 12, 1993, a RCRA Stabilization Initiative Expert Panel was assembled to identify potential stabilization measures for the site assuming a continued TCE groundwater problem. Pump and treat technologies such as carbon or air stripping were reviewed. Both uses of the pump and treat technologies were rejected due to the large volume of water that would be used, and the close location of the brook and river. The use of vertical containment by installing sheeting/grouting around the lagoons to contain leaching was also rejected because the sandy, gravelly soils would allow for migration of groundwater coming up from the containment wall (References 2, 5, 8, 17, 19, 20, 25, 26, 27, 28, 31, 33, 34, 35, 38).

Based on these results and discussions held between the facility and MADEP, MADEP required Reliable to complete a groundwater quality assessment program and report to evaluate the nature and concentration of contaminants in groundwater, and to determine the rate and extent of contaminant migration. Following completion of the Groundwater Assessment Study Report, it was determined that the possibility of contaminated site groundwater impacting any nearby private drinking water wells was unlikely since the majority of residences in this area are located upgradient (north and west) of the site and all residents receive their drinking water from the City of Norton. In addition, available reference materials state that no private drinking water wells are identified within a 0.5 mile radius of the site. Site survey data indicates that site groundwater flows southerly and discharges upward into Chartley Brook. According to reference number 33, groundwater contaminant concentrations near and in the brook are minimized due to sorption onto organic-rich peat and other fine-grained subsurface soils and the mixing with Chartley Brook surface water (References 27, 32, 33).

As described under Section II (Summary of Releases), TCE, VC and nickel were identified above MMCLs in the April 1996 sampling round. According to Ralph Fine of MADEP, the facility is required to report any results above MMCLs to MADEP. For those results above MMCLs, the facility is required to resample and reanalyze to confirm the presence of the constituents above the MMCLs. A contingency plan for further assessment and additional sampling has been

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developed to address any additional or continued contamination. The facility has not, nor has it been required to perform any other remediation or stabilization measures beyond activities associated with the closure of the lagoons and trench and the semi-annual post-closure monitoring (References: 38, 39).

Surface water - The primary sensitive receptors located within a 0.5 mile radius of the site consist of Chartley Brook, Wading River and wetlands. Surface waters are not used for drinking water within a 0.5 mile radius of the site. However, MADEP has indicated that the surface waters are used for recreational uses (i.e., swimming, canoeing). A summer camp is located east of the Wading River and north of the facility and a golf course is located south of the site on the opposite side of the Chartley Brook. In a phone conversation between Mr. Ralph Fine of MADEP and A.T. Kearney on September 8, 1997, Mr. Fine stated that the surface waters are currently unclassified. In addition, Mr. Fine provided results from the surface water data report dated August 23, 1995. Surface water samples are collected on a semi-annual basis at three locations: SW-1 (upgradient by the NPDES outfall), SW-2 (downgradient at the bridge) and SW-3 (also downgradient). TCE was identified at just above MMCLs for all three surface water samples taken at both upgradient and downgradient locations. Nickel results were 0.30 mg/l and 0.18 mg/l at the upgradient and downgradient locations, respectively. The last report for which surface water analytical results are available is April 25, 1996. Barium was the only constituent reported above the method detection limit at 0.02 mg/l (SW-1) and 0.01 mg/l (SW-2) (References: 5, 33, 35, 37, 38, 39).

As stated above, Reliable Electroplating does satisfy the Human Exposures Criteria for a YE determination. This decision was based upon the following five discussion points discussed with MADEP and EPA representatives: 1) Reliable owns the property overlying the shallow groundwater contaminant plume and is thus able to prevent the current installation of drinking water wells in the area overlying the plume; 2) the Lagoons and Trench were closed and capped and access to these areas is controlled; 3) there are no drinking water wells in the vicinity and the drinking water is supplied by the Town of Norton; 4) no bedrock groundwater contamination has been identified; and, 5) "the surface water is not used for drinking water and the contaminant levels are at MMCLs which should be safe for recreational uses" (Reference 39). It should be noted that TechLaw agrees with all of the above discussion points but, has reservations about the future uses of the property (after Reliable sells or leaves the property) and continued attempts by Reliable to further investigate and control groundwater contamination. Therefore, the following are suggested actions to help prevent any human exposure to groundwater and surface water contamination in the future.

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Recommended Actions

- Implement deed restrictions on the property to control potential future human exposures to groundwater contamination. The deed would include wording which would restrict the installation of drinking water wells in the area of the facility impacted by the contaminant plume and, also limit future uses of the property
- TCA contamination has been identified in the groundwater samples although Reliable states that the compound was never used at the facility. Furthermore, Mr. Ralph Fine of MADEP stated in a phone conversation with A.T. Kearney (now TechLaw, Inc.) that industrial facilities are located further upstream of the Reliable site. It is suggested that a full assessment of industry impacts to the area be performed to determine whether other industries are indeed contributing to contamination in the area.
- Reliable should continue to sample and monitor the Chartley Brook and Wading River to assess the potential risk associated with using the river for recreational activities (i.e. swimming and canoeing (summer camp), golfing, fishing). If levels above MMCLs are detected in any sampling event, measures (signs, public notices) should be taken to assure no potential human exposure.

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V. Annotated Bibliography

1. Memorandum from the Executive Office of Environmental Affairs to Reliable Electroplating, October 26, 1982.

Notice of Violation regarding the lack of documentation such as written inspection schedule and log, written personnel training records, written contingency plan, and written closure plans and closure cost estimates. Also provides description of facility's wastewater treatment lagoons.

2. Letter to Mr. Tilden, State of Massachusetts Department of Environmental Quality Engineering (MDEQE), from Mr. Steven Corr, Weston & Sampson Engineers, Inc., January 13, 1983.

Discussion of groundwater sampling and analysis results at Reliable Electroplating on November 7, 1983. Levels of turbidity, manganese and iron were above acceptable limits. Cyanide and copper remain above acceptable levels in one well each. Nickel concentrations have decreased but still remain above acceptable criteria in all three groundwater wells.

3. Authorization to Discharge Under the National Pollutant Discharge Elimination System, Federal Permit Number MA0004600 for Reliable Electroplating, March 30, 1984.

Attached to NPDES permit are effluent limitation and monitoring requirements under the permit.

4. Letter to Mr. Tilden and Mr. G. Monte, MDEQE, from Mr. Steven Corr, Weston & Sampson Engineers, Inc., August 23, 1984.

Discussion and analytical results collected as part of Phase I of the Closure Plan for the lagoons and sludge trench. None of the samples exhibited EP toxicity characteristics above the regulatory threshold for eight metals. However, samples taken from the sludge trench showed EP toxic and total metal levels above those of the background sample.

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5. Letter to Mr. Monte, MDEQE, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., October 25, 1984.

Results of five sets of groundwater samples, river and groundwater elevations, river and groundwater elevations over time, and a map showing the location of three sample wells in relationship to the two surface impoundments.

6. Letter to Mr. Dore, MDEQE, from Mr. Steven Corr, Weston & Sampson Engineers, Inc., April 2, 1985.

Response to comments from MDEQE regarding Reliable's Closure Plan submitted to MDEQE on October 3, 1984. Overview of the closure procedures for the surface impoundments such as removal of sludge procedures, fill materials to be used, and the post closure monitoring plan.

7. RCRA Technical Assistance Inspection Report, inspection and report issued by EPA Region I and MDEQE, June 19, 1985.

Provides overall process description, wastes generated and disposal practices. Violations are identified; primarily, monitoring deficiencies noted. Requires facility to install one more monitoring well, develop groundwater assessment outline and develop sampling and analysis plan.

8. Memorandum to Peter Dore, MDEQE, from Bob Stevens, MDEQE, July 10, 1985.

Review of available groundwater monitoring data identified a number of deficiencies. Installation, operation and maintenance of additional groundwater monitoring wells is primary deficiency noted.

9. Letter to Mr. Broadbent, Reliable Electroplating, Inc., from Mr. Tilden, MDEQE, July 29, 1985.

Notice of Violation. Facility operation as a Treatment, Storage and Disposal (TSD) because more than 1000 kg of hazardous waste was stored on site for greater than 90 days. Facility plans to submit request for a change in status to that of generator.

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10. Memorandum to Steve DeGabriele, MDEQE, from Bob Stevens, August 15, 1985.

Status of facility's compliance with subparts F and H of 40 CFR, 265. Enforcement actions with penalty are being forwarded to the state attorney generals office.

11. Letter to Mr. Robert Donovan, MDEQE, from Mr. Merrill Hohman, USEPA, August 26, 1985.

Summarizes hazardous waste inspection conducted at Reliable Electroplating, Inc., on June 19, 1985. Letter provides notice pursuant to Section 3008 (a)(2) of RCRA that EPA has found Reliable in violation of several state hazardous waste management regulations. Deficiencies noted include: contingency plan deficiencies, unlabeled containers, and insufficient groundwater monitoring.

12. Letter to Ms. Wrenn, MDEQE, from Mr. Dale Broadbent, Reliable Electroplating, September 7, 1985.

Notice to MDEQE that Reliable is operating as a TSDF under interim status and intends to revert to generator only status upon completion of the new wastewater treatment facility and closure of the surface impoundments.

13. Letter to Mr. Dale Broadbent, Reliable Electroplating Inc., from Mr. Leo Yelle, Conservation Commission, Norton, Massachusetts, November 4, 1985.

Order of conditions issued to Reliable concerning their proposed work activities (closure of the surface impoundments and sludge trench) in a Buffer Zone and Wetland Resource Area.

14. Closure Plan for the Reliable Electroplating, Inc. Wastewater Treatment Facilities, issued by Weston & Samsons Engineers, Inc., for Reliable Electroplating, December 1985.

Provides description of the Phase I, II, and III closure operations for the wastewater treatment lagoons and sludge trench. Includes description of the installation of a new treatment facility and post closure groundwater monitoring.

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15. Letter to Mr. Broadbent, Reliable Electroplating, from Mr. Thomas McMahon, MDEQE, January 6, 1986.

Acceptance and approval of engineering report and annotated plans describing new treatment technology to be used by Reliable for wastewaters.

16. RCRA Facility Assessment Decision Document, USEPA Region I, September 29, 1986.

Discussion concerning release to the environment of hazardous waste or constituents at the Reliable facility in the area of the two unlined surface impoundments and one unlined sludge trench. Recommend remedial investigation including groundwater monitoring to be conducted at time of closure of the impoundments in order to characterize extent of the contamination at the site. Document includes site maps and well water sampling results.

17. Gas chromatography-mass spectrometry analysis of purgeable organics, MDEQE, June 9, 1987.

Samples collected on May 11, 1987 and analyzed on May 20, 1987 for VOCs and metals at monitoring wells MW-1 through MW-4. VOC results above Drinking Water Criteria of 5.0 ug/l for Trichloroethylene at three wells. Nickel identified above the Federal action level of 0.1 mg/l at all three wells.

18. Letter to Mr. Dorant, MDEQE, from Mr. Steven Corr, Weston & Sampson, November 14, 1988.

Results of laboratory and statistical analyses of soil samples collected from the bottom of both surface impoundments. With the exception of silver, metals concentrations in soils from the bottom of the surface impoundments are below limits established in the approved closure plan (20% of EP Toxicity). Analytical results attached.

19. Letter to Mr. Fine, MDEQE, from Mr. Dale Broadbent, Reliable Electroplating, Inc., May 8, 1989.

Attached are results from the first round of quarterly groundwater sampling and analysis.

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20. Meeting minutes, Reliable Electroplating, Inc., June 5, 1989.

Attendees included members of MDEQE, EPA Region I, Reliable Electroplating and Balsam Engineering. Status of surface impoundment closure. Request for Reliable to collect and analyze additional samples for total metals and solvents.

21. Final Analytical Report, issued by Briggs Associates, Inc., for Reliable Electroplating, July 10, 1989.

Two soil sample results for metals parameters silver, nickel, zinc, and copper, and VOCs. All VOCs below detection limits. Nickel results at 470 and 1000 mg/Kg, respectively.

22. Letter to Mr. Ralph Fine, MADEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., July 20, 1990.

Status of groundwater monitoring and surface impoundment closure. Reliable completed initial year of sampling. Requesting approval to proceed with semi-annual monitoring program as outlined in the Groundwater Sampling and Analysis Plan, July 1989. Results of groundwater monitoring analysis attached to letter.

23. Letter to Mr. Broadbent, Reliable Electroplating, from Mr. Steven Dreezen, MDEQE, August 13, 1990.

Notice to Reliable that they must close the lagoons in compliance with post closure requirements in 310 CMR 30.590 and must comply with groundwater monitoring requirements set forth in 40 CFR Subpart F and the approved Groundwater Sampling and Analysis Plan. Department approved the backfilling of the lagoons as described in the approved Closure Plan, revised July 1987.

24. Letter to Mr. Fine, MADEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., November 20, 1990.

Regarding Reliable's Closure and Post Closure Plans. Attached to letter is a memorandum regarding an August 9, 1990 meeting between MADEP and Reliable concerning sampling and analysis and closure report requirements.

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25. Letter to Mr. Fine, MADEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., January 18, 1991.

Results of the semi-annual groundwater monitoring program. Results show that with the exception of nickel in OW-4, all parameters are decreasing in the downgradient wells. The results show for the first time the presence of 1,1,1-trichloroethane in OW-2. It was noted that TCA was not used in the past nor is it presently used at the facility.

26. Letter to Mr. Fine, MDEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., October 10, 1991.

Results of the semi-annual groundwater monitoring program. Samples collected on August 5, 1991. Results are similar to previous sampling round. Results show a steady decline for most parameters with the exception of nickel.

27. Letter to Mr. Dale Broadbent, Reliable Electroplating, Inc., from Mr. Steven Dreezen, MADEP, January 2, 1992.

Response to semi-annual groundwater monitoring results submitted under reference number 26. MADEP states that it appears that comparisons of the downgradient wells MW-2 and MW-4 show a significant increase for certain indicator parameters, such as nickel, and VOCs as compared to the background well MW-3. Requests a revision of the statistical data presented in original submittal.

28. Letter to Mr. Fine, MDEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., January 2, 1992.

Revised tables for statistical analysis of Reliable Electroplating's semi-annual groundwater monitoring data for 1990 and 1991. Statistical analysis shows a significant increase in nickel concentrations at downgradient monitoring wells. VOC results continue to decrease.

29. Letter to Mr. Fine, MDEP, from Mr. Thomas Hansen, Weston & Sampson Engineers, Inc., January 13, 1992.

Lagoon Closure Report includes background information on the site, closure certification, record plan, characterization of backfill and cap material and documentation of closure procedures.

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30. Letter to Mr. Dale Broadbent, Reliable Electroplating, Inc., from Mr. Steven Dreezen, MADEP, February 24, 1992.

MADEP's confirmation that they have received and reviewed Reliable's Closure Report dated January 10, 1992. Additional plan submittals and revisions are required prior to MADEP certifying closure of the lagoons and sludge trench.

31. RCRA Stabilization Initiative Expert Panel Outputs, USEPA Region I, July 12, 1993.

Identification of possible stabilization techniques to be used to contain groundwater contamination as a result of wastes disposed in the lagoons and sludge trench. All recommendations were rejected due to site conditions and the high groundwater table. However, data gaps such as identifying any wells impacted in the area and a full characterization of the TCE plume were recommended by the panel.

32. Letter to Mr. Dale Broadbent, Reliable Electroplating, Inc., from Mr. Steven DeGabriele, MADEP, December 17, 1993.

Notice of Noncompliance. Facility has performed inadequate groundwater monitoring. During closure activities the facility was required to conduct quarterly sampling, however during a site inspection conducted on September 15, 1993, evidence of only one groundwater sampling round for the year was found.

33. Groundwater Assessment Report, prepared by Weston & Sampson, Inc., prepared for Reliable Electroplating, Inc., March 21, 1994.

Purpose of the assessment was to determine site groundwater quality and flow directions, the interaction between site groundwater and adjacent Chartley Brook, and the potential impact of site groundwater on nearby sensitive receptors.

34. Letter to Mr. Dale Broadbent, Reliable Electroplating, Inc., from Mr. Al Nordone, MADEP, April 11, 1994.

Confirms receipt and review of Reliable's groundwater assessment report by MADEP. The MADEP agrees with report recommendations to perform additional hydrogeological assessment work. In addition, requires surface water and sediment samples to be collected in Chartley Brook primarily for VOCs and nickel.

35. Analytical Report, National Environmental Testing (NET), Cambridge Division for Reliable Electroplating, Inc., August 23, 1995.

Reliable Electroplating, Inc.
EPA I.D. No. MAD001209121

Analytical results for observation (also known as monitoring) wells (OW 1-4), deep aquifer well (WS-1), Surface Water samples (SW 1-3), and sediment samples (SED 1-3). VOC results above MMCLs were identified in OW-4 and SW-2 for 1,2 DCE, trichloroethene and vinyl chloride and for nickel in all surface water samples.

36. Letter to Mr. Dale Broadbent, Reliable Electroplating, Inc., from Mr. Al Nordone, MADEP, November 2, 1995.

Closure Certification with post-closure. MADEP certifies that the facility has completed closure of the former hazardous waste surface impoundments. Because some waste residuals were left in place at final closure, post closure care is required.

37. Memorandum to Jeff Chormann, BWP HW, Boston, from Mr. Kenneth Hulme, DEP-WES, April 25, 1996.

Analytical results for Chartley Samples. Sampling round consisted of four samples analyzed for VOCs and RCRA metals. Results above method detection limits were found for cis-1,2-dichloroethylene, tetrachloroethylene, trichloroethylene, vinyl chloride, copper, nickel and barium.

38. Telephone Conversation Log, between Mr. Ralph Fine, MADEP and Ms. Lori Mix, A.T. Kearney, Inc., September 8, 1997.

Updated information on the current status of the contaminant plumes from the Former Wastewater Treatment Lagoons and the Sludge Trench. VOC contamination above MMCLs and nickel still exists for the contaminant plume migrating from the lagoons and trench. Facility is currently required to conduct semi-annual sampling and analysis and notify MADEP of any positive results. No other remedial activities are currently being conducted at the site.

39. Memorandum to Mr. Mark Heaney, TechLaw, Inc. from Mr. Frank Battaglia, U.S. EPA New England, October 8, 1997.

The memorandum addressed concerns regarding the Draft report written by A.T. Kearney, Inc. The majority of the comments discussed the YE determination (Human Exposures Controlled). Specifically, written comments discussed groundwater and surface water contamination; closure of the Lagoons and Trench; drinking water wells in the area; and, recreational uses of the surface water near Reliable.

USGS

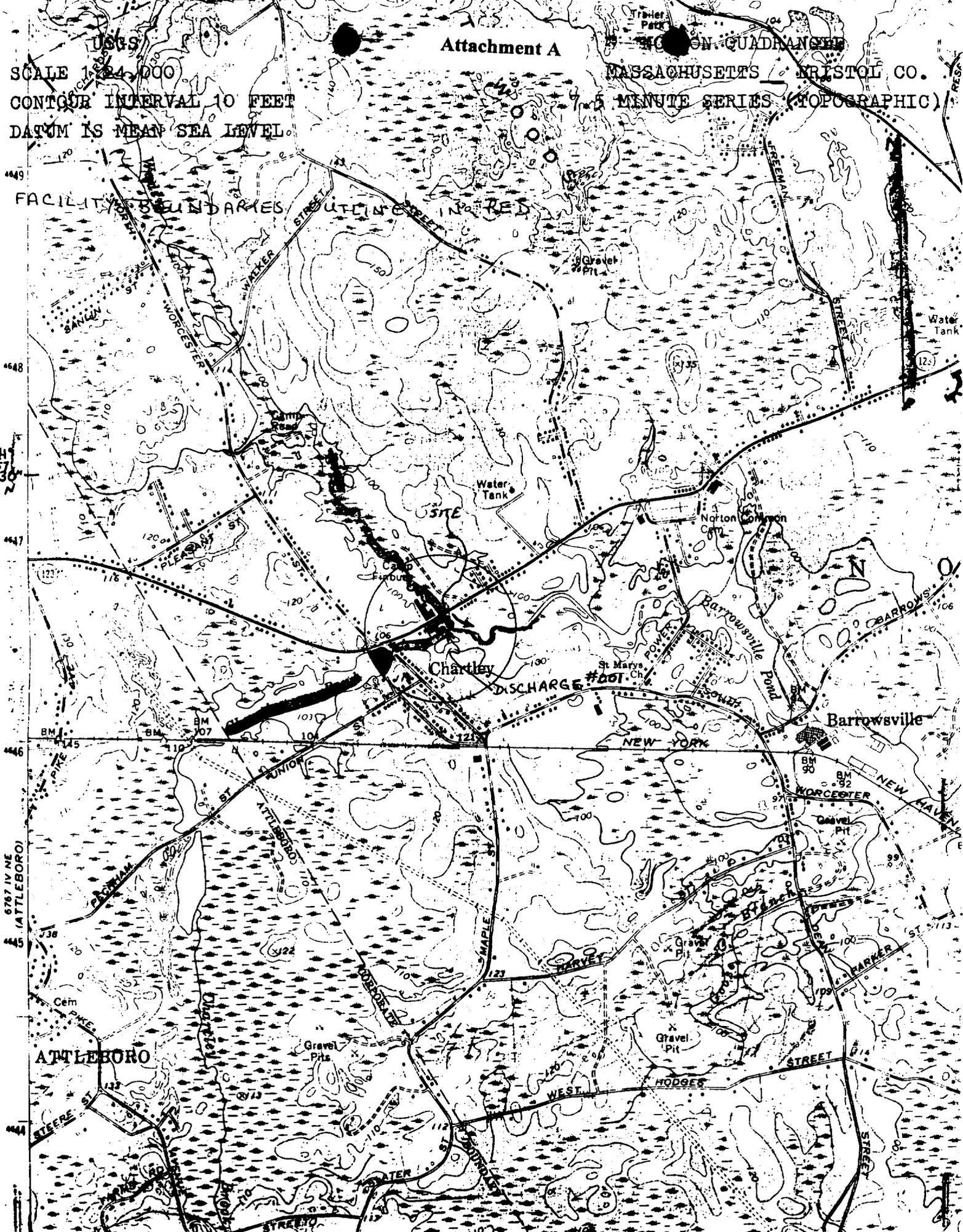
Attachment A

MASSACHUSETTS BRISTOL CO.

SCALE 1:24,000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL.

5 MINUTE SERIES (TOPOGRAPHIC)

FACILITY'S BOUNDARIES
OUTLINE IN RED



649
648
647
646

6767 IV NE
ATTLEBORO

ATTLEBORO

Chartley

Barrowsville

NEW YORK

WORCESTER

NEW HAVEN

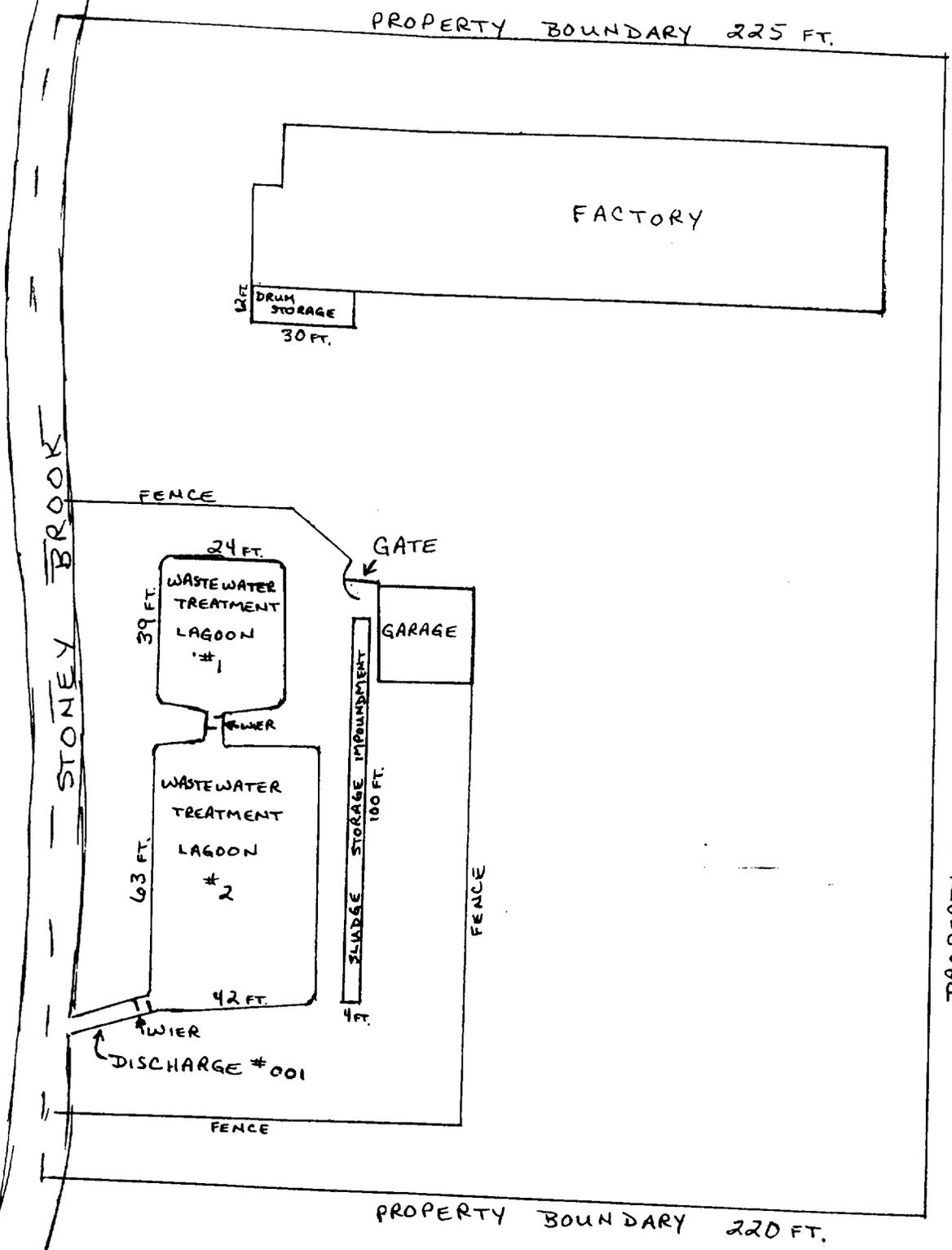
WEST

HODGES

STREET

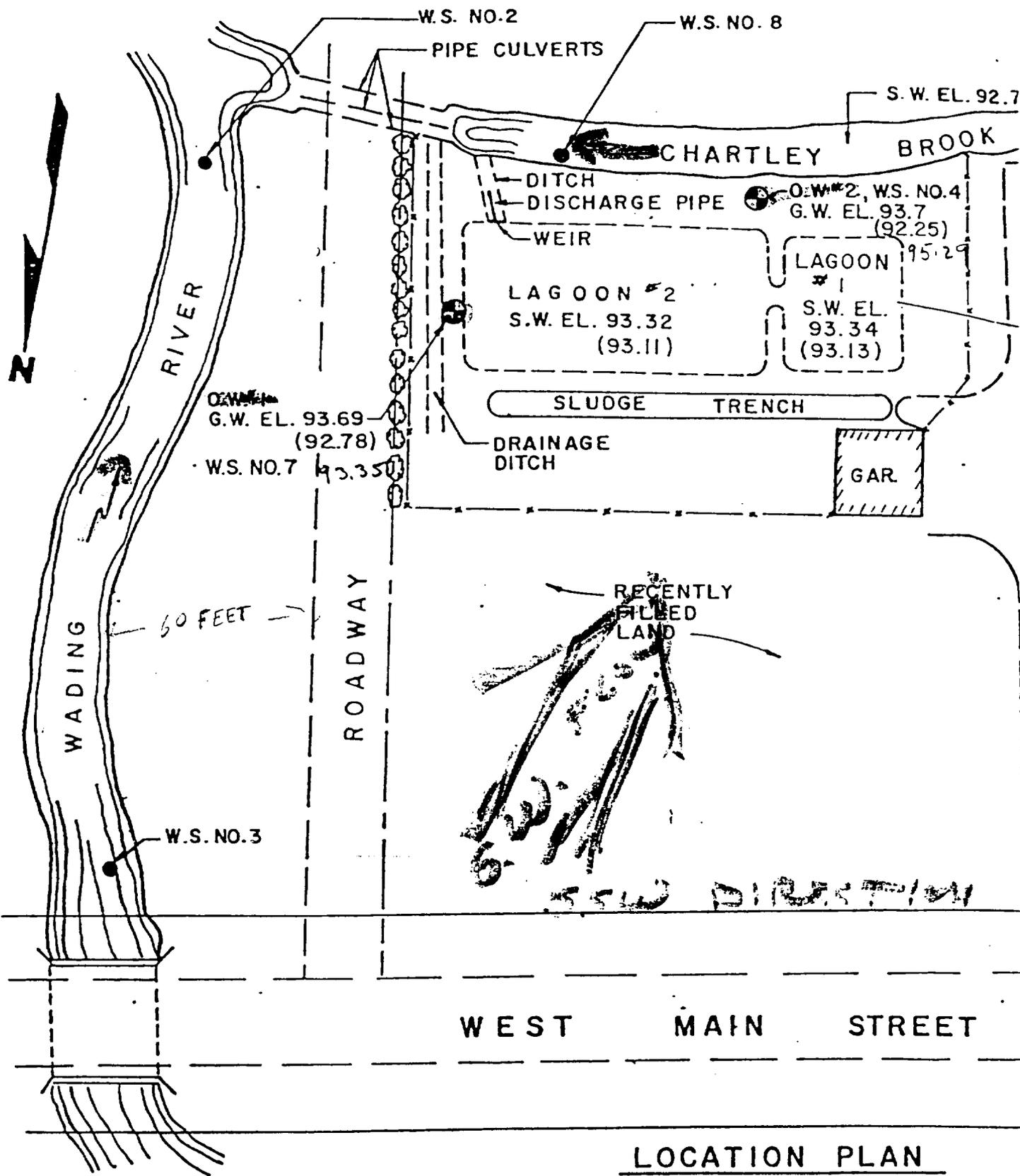
STREET

Attachment B



SCALE: 1" = 40'

WADING RIVER



LOCATION PLAN

SCALE: 1" = 40'

NOTES:

1. GROUND AND SURFACE WATER ELEVATIONS WERE TAKEN 12/3/82 (6127183).
2. ASSUMED BENCH MARK ELEVATION IS TOP SOUTH POSITION WITH SEALING NUT OF WATER MAIN GATE VALVE AT ELEVATION 100.00 (ASSUMED)