November 2003

Site Investigation Report

Environmental Restoration Project
Clean Water/Clean Air Bond Act of 1996
Independent Leather
321-333 South Main Street
City of Gloversville
Fulton County, New York

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ENVIRONMENTAL RESTORATION PROJECT
SITE INVESTIGATION REPORT
INDEPENDENT LEATHER
321-333 SOUTH MAIN STREET, GLOVERSVILLE, NEW YORK

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EPA REPORTS (BY REFERENCE):

VOLUME I:

1. *U.S. EPA Pollution Reports*, Independent Leather Site, Various Dates, Prepared by Paul Kahn, On-Scene Coordinator of U.S. EPA of Edison, New Jersey.

VOLUME II:

1. *Upstate Laboratories, Inc. Analytical Reports,* Various Dates.

VOLUME III:

1. *Geophysical Survey*, Independent Leather Site, U.S. EPA Work Assignment 0-222.1 – Trip Report, Dated May 31, 2002, Prepared by Gordon Shields of Lockheed Martin Technology Services of Edison, New Jersey.
2. *Soil and Sediment Sampling*, Independent Leather Site, U.S. EPA Work Assignment 0-222: Trip Report, Dated November 16, 2001, Prepared by David Aloysius of Lockheed Martin Technology Services of Edison, New Jersey.
3. *Final Report, Soil Contamination Investigation,* Independent Leather Site, U.S. EPA Work Assignment No.: 0-222, Lockheed Martin Work Order No.: R1A00222, U.S. EPA Contract No.: 68-C99-223, Dated January 23, 2002, Prepared by David Aloysius and Steven Clapp of Lockheed Martin Technology Services of Edison, New Jersey.
4. *Final Report, Results of Field Sampling, Testing and Geochemical Modeling,* Independent Leather Site, U.S. EPA Work Assignment No.: 0-222, Lockheed Martin Work Order No.: R1A00222, U.S. EPA Contract No.: 68-C99-223, Dated March 5, 2003, Prepared by David Aloysius and Dennis Miller of Lockheed Martin Technology Services of Edison, New Jersey.

1.0 INTRODUCTION

The City of Gloversville was approved in late 2000 for funding by the New York State Department of Environmental Conservation (NYSDEC) under the Clean Water/Clean Air Bond Act of 1996 for performing an Environmental Restoration "Site Investigation" Project, more commonly referred to as the Brownfields Program. The subject of the Brownfields investigation is the Independent Leather Site, a former tannery located at 321-333 South Main Street, City of Gloversville, County of Fulton, New York. A Site Location Map is provided as Figure 1 in this report.

To assist the City of Gloversville (City)in the successful completion of the project, C.T. Male Associates, P.C. (C.T. Male) was retained by the City to complete the technical aspects in accordance with the DEC Revised Technical and Administrative Guidance Memorandum (TAGM) issued December 22, 1997, entitled Municipal Assistance Environmental Restoration Projects, "Brownfields Program" (the "Procedures Handbook"). The Procedures Handbook sets forth the administrative and technical requirements for the completion of site investigation and/or site remediation.

This New York State (NYS) Brownfields project was unique in that prior to initiating the site investigation work, the Independent Leather Site was the subject of a United States Environmental Protection Agency (EPA) Emergency Response Action. EPA was on-site performing investigations, collecting and disposing of hazardous materials, and performing select remedial activities including the demolition of the main tannery building, maintenance garage and small storage shed. Many of the activities performed by EPA were activities contemplated under the NYS Brownfields Program. As such, C.T. Male's site investigation was modified to some extent to account for the work completed by EPA. This Site Investigation Report and a Remedial Alternative Report integrates the data developed and provided by the EPA.

The site investigation was completed in accordance with the Final Site Investigation Work Plan dated November 2001, as prepared by C.T. Male for the City of Gloversville. The Final Work Plan was reviewed and approved by the NYSDEC, NYSDOH and the City of Gloversville prior to commencement of the field activities. A copy of the Final Work Plan approval letter is presented as Exhibit 1. The Site Investigation Report (SI Report) details and documents the site investigations completed at the project site by

C.T. Male and United States Environmental Protection Agency. This SI Report was reviewed and approved by the City of Gloversville, NYSDEC and NYSDOH.

1.1 Purpose

The purpose of the SI Report is to present and detail the findings of the investigations completed from which a Remedial Alternative Report (RAR) is developed. From the SI/RA Report a Proposed Remedial Action Plan (PRAP) is developed by the DEC for public comment. Following the public comment period a Responsiveness Summary (as appropriate) is prepared followed by a Record of Decision.

The goal of the Site Investigation is to identify and assess known and potential sources of contamination, and to develop a comprehensive strategy to address and/or remediate the identified contamination as necessary to protect the environment and human health. The overall goal of the site Remediation Alternative Report is to outline various remedial strategies and associated costs which will achieve compliance with established regulatory clean up guidance levels and criteria. For this project, the target cleanup standards and guidance values are established in the following NYSDEC documents.

- Division Technical and Administrative Guidance Memorandum (TAGM)
  TAGM HWR-94-4046
  Determination of Soil Cleanup Objectives and Cleanup Levels
  Dated January 24, 1994 (Revised April 1995)
- Supplemental Division TAGM Memorandum
  Determination of Soil Cleanup Objectives and Cleanup Levels
  Dated December 20, 2000
- NYSDEC, 6 NYCRR Part 703.5
  Surface Water and Groundwater Quality Standards
  Dated June 1998
- NYSDEC Technical Guidance for Screening Contaminated Sediments,
  Human Health Bioaccumulation
  Dated November 22, 1993 (Reprinted with changes July 1994, March 1998 and January 1999)

1.2 Report Organization

This SI Report consists of seven sections. Section 1 of the SI Report is an introduction, which presents the purpose of the project and background information such as project work tasks and modifications to the work plan. This project background information is unique as it describes the work EPA performed during the completion of this project. Section 2 is related to the description and utilization of the site with a discussion of tanning activities, adjoining property utilization, site and area utilities, and site specific history. Section 3 relates to the study area investigation and consists of a description (i.e., dates of completion, number or sampling locations, etc.) of the investigative tasks and EPA's remedial measures completed. Section 4 presents the physical characteristics of the study area as obtained the site investigation. This section includes site conditions (i.e., soils, groundwater, regional geology, etc.) and surface features such as water bodies and drainage patterns. Section 5 discusses the nature and extent of the contamination in which the analytical results of soil, groundwater, surface water, and sediment samples are compared to applicable regulatory standards and guidance values. Section 6 pertains to the contaminant fate and transport (routes of migration, and contaminant persistence and migration) for the remaining site contamination. Section 7 presents the summary and conclusions of the entire report.

1.3 Project Background

1.3.1 General

In the mid 1990's, Independent Leather shut down its operations. Based on the condition of the site prior to EPA's Emergency Response Action, it appeared that the tannery was vacated in an "as is" condition at that time. The tannery has reportedly remained idle since its most recent shut down. Based on the observations made at the time of the pre-bid walk through, there were numerous and various sized metal, plastic and fiber containers within the site buildings which were partially full. There were also several process tanks and bulk storage tanks both within and outside the buildings. There was a partially full elevator oil reservoir tank within the elevator equipment/control. There were also several chemical process vessels and a sulfuric acid tank within the main tannery building. Two above ground tanks located at the southern end of the building are believed to have been used in conjunction with the waste water pretreatment plant. A large above ground No.6 oil tank (20,000 gallon) and

several above ground solvent tanks were apparently located on the eastern bank of the creek in the area of the current storage shed. A site sketch depicting the site layout prior to completion of EPA's Emergency Response Action is presented in Figure 4.

On April 5, 2001 the EPA initiated an Emergency Response Action at the Independent Leather Tannery in response to the nature and composition of the abandoned materials within the site buildings, and potential that the main tannery building would collapse during the winter season. On April 6, 2001 an EPA crew mobilized on site and was present for six days to restage the chemicals to a more secure area of the building. In June 2001 EPA fully mobilized to the site to complete the response action.

On July 11, 2001 representatives of the City of Gloversville, C.T. Male and EPA met to discuss the scope of investigations and possible remedial activities contemplated by EPA, and how those activities related to the City's current Brownfields Project. It was resolved at that meeting that C.T. Male would prepare a draft work plan describing the required investigative tasks and comparison of those to EPA's planned activities to date. Activities which are required under the NYSDEC Brownfields Program, but which are not part of EPA's scope of work, would be performed by C.T. Male. The proposed work plan would also include the process by which C.T. Male would review, compile and incorporate data generated by EPA into a Site Investigation/Remedial Alternatives Report that would ultimately be submitted to NYSDEC under the Brownfields Program requirements.

Following discussions at the July 11, 2001 meeting, a draft work plan was prepared. The tasks required by the Brownfields Program were compared to EPA's activities, and after review by all parties involved, the work plan was finalized and submitted to NYSDEC for approval in November 2001.

1.3.2 EPA CERCLA Emergency Response Action

From April 2001 until December of 2001, EPA was on-site aggressively packaging and removing hundreds of drums of chemicals, including corrosives, metallic pigments, resins, acids, lab chemicals, water reactive solids, chromium solutions, and biowaste consisting of animal hair, skin fleshing, and small body parts. Once the wastes were properly disposed off-site or relocated on-site for subsequent disposal, EPA demolished three buildings, the main tannery building and smaller maintenance building on the

west side of the creek and the storage shed located on the east side of the creek. EPA also cleaned the interior of the secondary tannery building on the east side of the creek. All of the building demolition debris was transported to the Fulton County Landfill. Due to inclement weather, EPA demobilized for the winter months and remobilized to the site on May 13, 2002 to finish the removal action. This final phase of EPA's response action consisted of the following:

- final cleaning and demolition of the WWTP and concrete foundation walls,
- disposal/recycling of remaining scrap steel and wood beams from the old bridges,
- placement, grading and seeding of 13,000 CY of backfill over the entire west side of the site,
- closure of an abandoned 300 gallon UST found along West Main Street,
- closure of an abandoned partial20,000 gallon UST and removal of associated petroleum contaminated soil,
- reconstruction of damaged areas of creek banks, and
- completion of exploratory trenches in designated areas where a geophysical survey identified anomalies.

EPA demobilized all of their equipment from the site in the end of September 2002. C.T. Male was provided with EPA prepared weekly Pollution Reports that summarize the work completed under the Emergency Response Action. These reports include background information, site information (site description & description of threat), response information (current situation, actions taken, key issues and next steps), cost information and disposition of waste. A copy of the EPA Pollution Reports are presented as a separate volume (Volume I - EPA Reports) to this report.

1.4 Final Site Investigation Scope of Work & Modifications

The Final Site Investigation Work Plan outlined the following: each project task, the investigative scope of work, the quality assurance/quality control plan, the field sampling plan, the site specific health and safety plan, and the citizens participation plan. The project work tasks were to include the following:

- site reconnaissance
- geophysical investigation (ground penetrating radar survey);
- inventory, characterization and disposal of abandoned materials;

- evaluation of floor drains;
- evaluation of pretreatment waste water plant;
- subsurface evaluation of above ground and underground storage tank locations;
- evaluation of creek sediments, surface water and springs;
- fish and wildlife impact analysis;
- asbestos and lead based paint pre-demolition survey;
- evaluation of transformers;
- assessment of building materials;
- site wide subsurface/hydrogeologic evaluation;
- evaluation of boiler room equipment;
- surface soil sampling and analysis;
- site survey; and
- data validation of all of the analytical reports.

The project scope was modified during the performance of the project as a result of the investigation and remedial tasks completed by EPA, as summarized below:

1.) One of the work tasks was to inventory, characterize and dispose of abandoned materials present in the site buildings. EPA, as part of their Emergency Response Action, characterized and disposed all of the abandoned materials that existed on-site, therefore C.T. Male did not perform this task.

2.) An evaluation of the building floor drains was planned to determine the layout and discharge locations of the building drain systems. EPA razed one of the two main buildings as part of their Emergency Response Action. The residual sediment and material within the drain systems were reportedly removed prior to demolition of the Main Tannery Building and as part of the cleaning efforts of the Secondary Tannery Building. Therefore, C.T. Male did not perform a physical evaluation of the building floor drains.

3.) An evaluation of the pretreatment wastewater plant. EPA, as part of their Emergency Response Action, sampled the water and sludge for waste characterization. Once the results were received, EPA determined a few metals were above the threshold for discharge to the local sanitary sewer system. As such, chemical stabilization was performed by EPA to precipitate the metals of concern so

that the balance could be discharge to the local sewer system. The sludge was also removed from the treatment tanks and the interiors were cleaned.

4.) C.T. Male conducted an asbestos survey of the site buildings several years ago. It was intended to perform an updated asbestos survey to determine if there has been a change in the amount, condition or occurrence of asbestos containing materials within the site buildings. EPA reportedly collected and analyzed select samples of suspect asbestos containing materials and abated all asbestos containing materials prior to or during the demolition of the Main Tannery Building. Therefore, an updated asbestos survey was not performed.

5.) Previous research indicated that pole mounted and pad mounted transformers were present on-site and the pad mounted transformers were potentially owned by tannery. An evaluation of the pad-mounted units for PCBs was planned to determine proper transportation and disposal methods for the units. However, EPA removed all transformers and disposed of them off-site.

6.) As the main tannery building, the smaller maintenance shop and the storage shed were demolished by EPA, an assessment of the various building materials for disposal was not applicable. One building remains at the site, however, the City does not anticipate demolition of this structure at this time.

7.) Surface soil sampling and analysis was anticipated for this project as detailed in Section 2.1.13 of the approved Work Plan. EPA performed a soil contamination investigation, which included collection and analyses of surficial soil and sediment samples for total chromium analyses, and six other sampling locations for expanded parameters. C.T. Male's surface soil sampling and analysis plan was modified to account for the work completed by EPA in this regard, and was approved with input from NYSDEC and NYSDOH.

2.0 SITE DESCRIPTION AND UTILIZATION

2.1 Site Description

The project site is located at 321-333 South Main Street in the City of Gloversville, County of Fulton, New York. The site boundaries lie within the northeast quadrant of the intersection of South Main Street and Hill Street. The site is identified on City of Gloversville tax maps as being within the parcel with section 149.13, block 2 and parcel 9. The parcel is approximately 3.7 acres in size. The subject site can be accessed by South Main Street and Hill Street. The approximate latitude and longitude for the site is 43° 02′ 22″N and 73° 21′ 10″ W. A Site Location Map is included as Figure 1. A Boundary Survey depicting the locations of its features is presented as Figure 2.

The site is situated in the middle of a commercial/retail, light industrial area in the City of Gloversville. The site is bound to the west by South Main Street; to the east by former railroad tracks that are now a bike path with a wooded area and Callanan Gravel Pit on the other side of the bike path; to the north by a car wash; and to the south by commercial/retail businesses and Hill Street.

The site's property boundaries create an irregularly shaped parcel. The site is currently a defunct tannery complex. The Cayadutta Creek flows onto the site from the north and continues in a southerly direction through the middle of the parcel. At its peak, the site contained four separate buildings which were associated with the tannery process, and a sewage treatment plant. These buildings were located on both sides of the stream with steel/wooden bridges over the stream allowing access to each side of the stream as shown in the black and white aerial photograph presented in the Figure 3.

The main building complex (two buildings) was located in the western section of the parcel, which was razed as part of EPA's Emergency Response Action. For the purpose of this report, these buildings are referred to as the "main tannery building" and the "maintenance shop". The main tannery building was a multi-story building with a basement approximately 30,000 square feet in plan size. EPA designated the main tannery building as Building #1 for the purpose of their work. The maintenance shop was a single-story slab on grade building approximately 3,200 square feet in plan size.

The main tannery building was constructed on a stone and concrete foundation with a basement. The remainder of the building was predominantly of wood post and beam construction. The basement floor of the main tannery building contained the majority of the tanning wheels, chemical tanks, drums and other tanning products, and the pretreatment sewer plant. A small room extending off of the northern side of the building and basement was used as the color room. This room, prior to being cleaned out, contained numerous drums and containers of various chemicals used to dye the leather. A small laboratory was also located on the basement level. The upper floors were used in the tanning process including drying, finishing, buffing and shaving, shipping and receiving, offices, a small retail store and warehousing.

The one-story machine shop was constructed on a slab on grade concrete foundation and was stick framed. The shop contained various milling machines and lathes, and was in part used as a parts stockroom.

On the eastern portion of the parcel, two additional buildings were located for supplemental tanning activities. The two buildings, for the purpose of this report, are referred to as the "secondary tannery building" and the "storage shed". The storage shed was demolished as part of EPA's Emergency Response Action, but the secondary tannery building remains. The secondary tannery building is approximately 12,700 square feet in plan size. EPA designated the secondary tannery building as Building #2 for the purpose of their work. The storage shed was a single story wood frame building approximately 1,600 square feet in plan size. The concrete slab for the storage shed was left in-place. The storage shed was apparently used for equipment storage.

The main and older portion of the secondary tannery building is two stories constructed of concrete and masonry block and brick. A wood frame portion appears to have been added to the southern end of the building. The use of the building appears to have been primarily for warehousing purposes, however at some point it appears it was used in the tanning process as several tanning wheels, chemical storage tanks, floor drains and piping systems were present in the building.

2.2 Tanning Activities

The purpose of this section is to provide a basic understanding of the tanning process as how that may relate to potential contamination of the site. Assumptions and inferences

have been made based on research which may or may not necessarily be correct. Historical research indicates that Independent Leather primarily dealt with sheep skins prior to 1954, and more recently with cow hide.

The tanning and finishing of hides involves many processes, each of which utilizes particular chemicals and generates various liquid and solid waste streams. Independent Leather is reported to have only completed tanning, dying and finishing pickled animal hides. The beaming of hides reportedly has not been part of the process at the site, however site observations contradict this report. The common chemicals and products used in these processes and which were identified during the site walk through include:

Sulfuric Acid	Hydrate Lime	Tanasol 9W	Ucar G-50
Formic Acid	Magnesium Oxide	Catalix T	Atasol
Acetate Acid	Titanium Oxide	Retan Resin	
Muriatic Acid	Sodium Nitrite	Sodium Chloride	
Caustic Soda	Kerosene	Chromium Sulfate	
Sodium Hypochlorite	Stoddard Solvent	Various Pigments	
Sodium Bicarbonate	Methanol	Formaldehyde	
Methylene Chloride	Derminol Liquor	Detergents	

After the hides are removed from the carcass, they are salted with sodium chloride and/or other salts and cured (i.e., dried). As a result of the curing, the hides lose most of their natural moisture. To restore the moisture, the hides are soaked in water added with chemical wetting agents and disinfectants (biocides and fungicides). It is possible that some of the biocides and fungicides historically used in the early days of commercial tanning were mercury based compounds. Sodium fluoride may have been later used. The hides absorb water and become softer and cleaner. If the hide was a sheepskin, stoddard solvent or other petroleum based solvent may have be used to emulsify fat. At the completion of the soak, the skins are washed by introducing fresh water at one end of the soaking vat allowing the effluent to discharge. The washing removes excess salt, dirt and blood from the skins.

Fleshing is a mechanical operation that rids the hides of excess flesh, fat and muscle. Soaked hides are removed from the storage vat, piled on pallets to drain, and transported to the fleshing machine. An operator places a hide into an open machine, flesh portion against the cylinder and closes the machine. The front rollers position the

hides against the cutting cylinder that is rotating at high speed. The latter scraps away the undesirable fleshy matter while the rollers withdraw the hide into the hands of the operator.

Once the fleshing is completed the hides are then ready to be dehaired (beaming). The hair is removed by putting the hides in a rotating drum and adding chemicals. The chemicals commonly used most recently are calcium hydroxide (hydrated lime) and sodium sulfide. The sulfide attacks the keratin in the hair and dissolves it. Prior to the use of calcium hydroxide and sodium sulfate, arsenic sulfide in a paste form was spread over the hides to assist in the removal of the hair.

At this point the hides are free of hair, plump and moderately clean. The alkaline materials used in the de-hairing are still present in relatively large amounts and must be removed (i.e., bating). The collagen fibers in the skin tend to hold onto the last positions of the lime. The first phase of the bating process is termed de-liming. De-liming eliminates the lime and alkaline chemicals that are present within the hide, essentially neutralizing them. The hides are placed in a rotary drum with water introduced through a pipe and effluent discharges through the perforated door. Additional chemicals are commonly utilized to speed up the de-liming operation. Ammonium sulfate or ammonium chloride is added to convert the residual lime into soluble compounds which can be washed free. After this process the hides are washed thoroughly to rid them of all substances which this operation has loosened or dissolved. Pickling places the hides in an acid environment and prepares them to accept tanning or re-tanning material. This step is necessary because the tanning agents that follow are not soluble under alkaline conditions. If they were added to non-pickled skins, they would precipitate from the solution and not affect the tannage. The process involves adding salt and sulfuric acid to the hides.

Tanning is the final process in turning hides into finished leather after pickling. The two most common methods of tanning are chrome and vegetable tanning. It is believed that chrome tanning was the preferred method utilized at Independent Leather. After pickling the hides are placed in a bath of trivalent chrome (chromium sulfate). The chrome bonds to the hide fibers and makes the hides resistant to bacterial attack and high temperatures. Once the chrome has soaked through the hide, the chrome is "fixed" by adding to the tanning bath an alkaline chemical such as sodium carbonate or bicarbonate, or magnesium oxide. Re-tanning gives the tanner an opportunity to

combine the desirable properties of more than one tanning agent into leather. There is in effect a second tannage. There are a variety of materials that can be employed for this purpose, the more common ones being the addition of vegetable extracts and sytans (man-made chemicals).

Leather may be considerably enhanced by dying. Dying is accomplished with aniline dyes derived from coal products. The dye combines with skin fibers to form an insoluble compound which becomes part of the skin itself. The dyes were added to the drums along with water and synthetic tanning materials at a select temperature to obtain the desired color. After dying, the hides are fat-liquored to lubricate the leather and increase its tensile strength and pliability. The basic ingredients of fat liquors are animal oil and related fatty substances.

To create an even thickness on the hides, a machine shaved the hides. The shaving process generated dust that was typically high in chromium. The dust was usually captured with large hoods and plumed to the bag house. The bag house would collect the dust and would be emptied, as necessary.

The final step is finishing the leather. The leather receives a light application of a transparent coating, which provides a protective and durable film. The coating may consist of polyurethane, nitrocellulose, wax, vinyl or acrylic. The end use of the leather product determines the type of finish process to be applied and varies widely.

2.3 Area Property Utilization

The adjoining and surrounding land uses in the area of the subject site are described as follows:

North: Softspra Car Wash lies north of the site at 307 South Main Street.

South: Hill Street is immediately south of the site. Beyond this roadway at 337 South Main Street is Manor House Restaurant.

East: Former railroad tracks, now a bike path and wooded land. Further east lies Callanan Gravel Pit at 15 Hill Street.

West: South Main Street lies immediately west of the site. Don's Towing & Repair, a maintenance garage, which also includes auto sales lies west of the site across South Main Street at 330 South Main Street. Albie's Carpet Craft Wall Covering & Linoleum is also west of the site, further north of the maintenance garage at 314 South Main Street.

2.4 Utilities

2.4.1 Site

The site has been vacant and defunct since the 1990's, therefore the utilities to the site have been disconnected or temporarily put out of service. The site was reportedly connected to the municipal water supply (Gloversville Water Works). There was no evidence identified through this investigation that a private well was used as a water supply source. The water service shutoff for the site is reportedly located along South Main Street near the southwest side of the former main tannery building. As part of EPA's Emergency Response Action, a water spring within the western portion of the site was encountered. EPA installed a french drain system to divert the continuos low flow of water back into the ground and on-site creek.

Based on historic site mapping, the site's wastewater and/or sewage disposal were to a settling tank, then a wet-well with a flume and ultimately discharged to the municipal sanitary sewer trunk line. At sometime in the 1980's an on-site wastewater treatment plant was constructed with the discharge still being to municipal sewer system. The wastewater treatment plant was cleaned, dismantled and backfilled as part of EPA's Emergency Response Action.

The heating source for the buildings was reported to be fuel oil. There were above ground storage tanks located on-site that were used to stored fuel oil. One 20,000 gallon tank was located on the east side of the creek adjacent to the storage shed. A second tank was possibly located on the west side of the creek outside the boiler room of the main tannery building.

Electric power for the buildings was supplied through the two on-site pad-mounted transformers, which were located on the west of the stream and south of the maintenance building. On October 2, 2001, the transformers were removed from the

site under EPA's Emergency Response Action. The transformers were transported by Price Trucking Corporation to CWM Chemical Services, LLC facility located in Model City, New York.

2.4.2 Area

Area utilities consist of primarily overhead electric power from Niagara Mohawk Power Company. Municipal water supply from the City of Gloversville Water Works provides public water to businesses and residences in the area of the site. Sanitary sewer disposal is also from the City of Gloversville with the treatment plant operated by the Gloversville-Johnstown Joint Sewer Board. Currently, there are two main sewer trunk lines that traverse the site. One line follows the west side of the creek and the other follows the bike path along the eastern property line. Both sewer lines generally run on a north-south direction. Sewer manhole covers are located in the southwest portion of the site and just north of the site's northeast property corner.

2.5 Site History

The Independent Leather Tannery site has been used to tan, dye and finish pickled animal skins since the beginning of the 20th Century. It is reported that beaming of skins, the process of de-hairing the skins, was not part of the process at Independent Leather. However, based on observations of piles of waste hair and deer tails within the secondary tannery building, beaming may have also been performed. For the years of operation prior to the establishment of waste water treatment facilities in the Cities of Gloversville and Johnstown, it is inferred that the liquid wastes generated in the various tanning and finishing processes were discharged directly to the Cayadutta Creek, which flows through the center portions of the site. In the early 1980's, the area tanneries were mandated to construct and maintain wastewater pretreatment plants and monitoring stations. The wastewater pretreatment plant at Independent Leather was reportedly in operation in 1984. Liquid wastewater from the on-site plant was discharged to the municipal sewer system. Sludges from the plant were reportedly removed and disposed of at the local landfill. There is some limited information that leather shavings were periodically stockpiled on the ground surface within the southern sections of the site on the west side of the creek.

Sanborn Fire Insurance Maps of the site for the years 1912, 1927, 1949 and 1969 were acquired at the NYS Museum. Copies of these maps are presented in the approved Work Plan and are discussed below.

In 1912, two tanneries were located on the site; Darius Filmer Leather Dresser within the northern section of the property, and H.R. Bradt Leather Dressers within the southern sections of the site. Both of these facilities are primarily located on the western side of Cayadutta Creek. A feature identified as a dust pipe, which crosses the creek to a storage building is connected to the Darius Filmer Leather building. A coal storage shed is also depicted on the site which suggests that the building furnaces and boiler utilized coal as an energy source. An above ground tank is depicted on the adjacent property southeast of the subject site.

The 1927 Sanborn Map depicts several changes to the property. The tannery is now identified as the Richard Young & Co. Leather Dressers. The H.R. Bradt Leather Dressers building is no longer present. Several additions to the 1912 Darius Filmer Leather Dresser tannery are apparent as well as several other free standing buildings on both the eastern and western sides of Cayadutta Creek. Additions to the main tannery building are apparent along the building's northern eastern and southern walls. The 1912 coal storage building has been replaced with a larger structure identified as a "Shop". Two small structures are located south of the shop. A bridge over the Cayadutta Creek is present, providing access to a large structure south of which is a Coal Shed. Two smaller buildings are located south of the coal shed. The fuel source for the tannery is identified as coal. Three petroleum bulk storage tanks are located on the adjacent property southeast of the site. The occupant of this adjacent parcel is identified as Standard Oil Company of NY.

There are some site changes noted in the 1949 map as compared to the 1927 map. The site is now identified as Independent Leather. Other changes include a large addition on the southern end of the main tannery building, and the presence of a dust house directly over the Cayadutta Creek. The petroleum tanks within adjacent southeast property are not shown and the site is now identified as a Contractors Supply Yard with a Wholesale Beer Warehouse.

There are only a few changes in the site layout between the 1949 and 1969 maps. These changes include the addition of a new boiler room next to the existing boiler room, a

new wooden bridge over the creek in the northern section of the site, and a new leather warehouse within the southeastern section of the property. It is believed that layout and use of the site generally remained similar from 1969 until 1990's. In the mid 1990's, Independent Leather shut down operations and left the tannery in an "as is" condition at that time. The tannery has reportedly remained idle since 1990.

2.6 Previous Site Investigations

C.T. Male has conducted investigative work for the former owners of the site. C.T. Male does not currently have permission from those former owners to release or utilize any of this information. The work included a 1988 Environmental Audit and Site Assessment Report, which included an Asbestos Containing Materials Survey. No other previous site investigations were reported to exist for the subject site.

According to NYSDEC spills database, one petroleum spill is registered for the subject site of Independent Leather. The NYSDEC Spill Number is 0105001 and was reported to NYSDEC on August 8, 2001. The spill report remarks indicate that a caller reported a sheen on the water (unknown type of oil) and a slight odor in the air. NYSDEC remarks indicate that workers from EPA, who were engaged in a cleanup of the Independent Leather site noticed a sheen on the creek and put out boom and then traced it upstream to a local dealership. The sheen reportedly dissipated and the car dealership has recently upgraded pollution prevention systems and no floor drains were visible. No material was recovered and no further discharge was noted. The spill incident was issued a closed status on August 14, 2001.

On December 6, 2001, NYSDEC and Blasland Bouck and Lee (BBL) conducted a stream survey in Cayadutta Creek to probe sediments upstream of Hill Street to determine if sheens and odors were produced. NYSDEC's survey also sought to determine where coal tar was seeping into the creek. The survey consisted of probing the creek from the Hill Street Bridge to the Merkt Oil petroleum bulk storage facility. It was reported that sheens, ranging from light silver to visible product thickness were observed over the entire length of creek along the Independent Leather site. Many of the sheens were accompanied by a strong petroleum odor. Since petroleum contamination was observed in creek, NYSDEC contacted the NYSDEC spill hotline and recorded the observations as Spill Number 0108925. NYSDEC noted that no significant sheens and no petroleum odors were observed upstream of the Independent Leather site. NYSDEC

concluded that existing data suggests that the petroleum seeps observed are not connected to the Niagara Mohawk Gloversville MGP site and the petroleum observations were adjacent to the Independent Leather site. This spill number was closed as of November 18, 2002.

Two other chemical spills were reported, which caused fish kills in the Cayadutta Creek. Information relating to these spills is presented within the Fish and Wildlife Impact Analysis Report in Exhibit 3.

3.0 STUDY AREA INVESTIGATION

3.1 Site Characterization

The investigations were conducted within property boundaries of the subject site, which was almost completely used by the tanning process in one manner or another. The buildings west of the Cayadutta Creek have been demolished, therefore, the investigation also focused on areas underneath those former structures.

Investigation of the project site was performed through the completion of specific work tasks taking into consideration the work completed on-site by EPA under their Emergency Response Action. In this manner the work tasks were modified as necessary based in part on the results of EPA's work. This approach allowed for characterization of the site conditions with little duplication of efforts. The following subsections provide dates of work task completion, select work task results (i.e., number of borings advanced, monitoring wells installed, etc.) not presented elsewhere, and a description of project deviations from the NYSDEC approved Site Investigation Work Plan. EPA completed work tasks and the findings of those work tasks are also presented within this section as witnessed by C.T. Male personnel or as gathered from the EPA Pollution Reports or other EPA provided documentation.

Some of the investigative tasks performed by C.T. Male included sampling and analysis of soil and groundwater and other media. All of the analytical data for this project was validated by a third party data validator in accordance with the Guidance for the Development of Data Usability Summary Report (DUSR). The DUSR provides an evaluation of the analytical data to determine whether or not the data meets the project specific criteria for data quality and data use.

3.2 Boundary Survey

A boundary survey was conducted by C.T. Male to locate existing site features and property lines. The initial field work was completed in January 2002. Follow-up field work was performed in May 2002 to pick up the locations of the test borings/monitoring wells, and monitoring well elevations (grade and top of PVC). EPA had also requested that spot elevations be collected from select site features (i.e.,

waste water treatment plant remains and other concrete features) that were going to remain and would be buried during site filling and grading. That additional information is also shown on the site's Boundary Survey presented as Figure 2. The updated metes and bounds description of the site is included in Appendix A.

3.3 Inventory, Characterization and Disposal of Abandoned Materials

The EPA performed a RCRA Compliance Evaluation Inspection (CEI) at Independent in July 1994. During the assessment drums and containers were identified within the buildings and on the site grounds. The resulting recommendation from the CEI was that sampling and analysis of abandoned materials would be required to determine if CERCLA hazardous wastes are present, and if so, to conduct the appropriate CERCLA Emergency Response Action.

According to the April 17, 2001 EPA Pollution Report, a preliminary assessment of the site was conducted in March 2001 at the request of City officials and representatives from NYSDEC to determine if the site was eligible for CERCLA Emergency Response Action. Although the site was believed to be eligible, heavy snowfall resulted in the partial collapse of roof and the buckling an exterior wall prior to EPA mobilizing to the site. City officials were then concerned that total collapse of the roof into the basement would result in the release of chemicals in the basement and possible fire situation. EPA assistance was requested to address the threat. EPA moved more than 200 containers of chemicals from the partially collapsed side of the building to a more secure location in the building. Deteriorated containers were over-packed or bulked into sound containers, and staged on wooden pallets. Therefore, if further collapse occurred at that time, no chemicals would be involved. EPA demobilized from the site after notifying the Gloversville Fire Chief and Deputy Building Inspector of the new drum staging area.

EPA remobilized to the site approximately two months later in the beginning of June 2001 to initiate the Emergency Response Action. EPA's focus was securing and ultimately disposing of abandoned drums, other chemical containers, and biological waste in the basement and other areas of the defunct tannery complex. In July 2001 EPA completed bulking chemical containers from both buildings, and consolidating 368 containers into 256 drums for disposal. Additional drums of unused product were

offered to a local tannery, however, these materials were refused and were included with the other 256 drums slated for disposal.

An open 30-gallon drum of sodium hydrosulfite, a water-reactive solid was discovered during the EPA activities. Since this material could ignite spontaneously in high humidity, the container was covered, over-packed and segregated. EPA contacted the manufacturer to arrange for its pick-up and disposal. Prior to its disposal a one gallon container of the same material was found and was also placed in the same over-pack drum.

In mid July 2001, 385 empty fiber, metal and poly drums were removed from the site for recycling/disposal. In late July 2001, EPA crushed empty drums for disposal. In August 2001, EPA bulked 14 55-gallon drums of hydraulic oil from elevator oil reservoir for disposal and loaded 26 pallets of scrap leather for recycling.

Prior to handling, all biowastes including animal hair, body parts and fleshings were sprayed with a bleach/soap solution. Empty drums were individually covered with shrink-wrap to minimize surface area exposed to potential biological contamination. The full drums were moved to a decon area, wiped with decon solution, and moved to a clean staging area. In September 2001, 347 drums of bio-waste were shipped off-site for disposal via incineration. A roll-off container containing bio-waste was emptied onto the floor in secondary tannery building and was deconed with bleach solution and returned to its owner.

3.4 Geophysical Investigation

3.4.1 Performed by EPA

In April 2002, EPA performed geophysical surveys at the site to investigate an area where hazardous wastes were suspected to be buried and to locate potential exploratory excavation areas. The geophysical surveys included electromagnetic (EM), and ground penetrating radar (GPR) methods to accomplish the task. The geophysical survey was primarily focused on the southwestern quadrant of the site near the intersection of South Main and Hill Streets. The details of the methods used, results and observations, and conclusions and recommendations are presented within Lockheed Martin's May 31, 2002 Report provided in Volume I - EPA Reports.

Lockheed Martin concluded that anomalous EM, the vertical magnetic gradient data from the magnetic survey and the GPR data indicate the possible presence of buried metal at several locations within the southwest corner of the site, as shown in Figure 5 of their report (See Supplemental Volume III). According to Lockheed Martin, there were two main features evident from the results of the geophysical surveys. The first feature was an area of probable buried metal objects in the southeast corner of the survey area. The second feature was a probable buried metal pipe that occurs along almost the entire west side of the survey area and could be considered an existing utility. EPA explored these features through machine excavations to evaluate the nature of the objects.

Based on the geophysical surveys performed by EPA, it was concluded that suspect buried objects may have been present in the southwest corner of the site, and therefore, EPA conducted exploratory trenching. As detailed in EPA's Pollution Report #16 dated June 1, 2002 exploratory trenching of the areas where GPR identified metallic anomalies revealed no buried drums or tanks. The excavating uncovered numerous metallic objects, including the remains of wooden tank straps, chain-links from a conveyor, liquid values, and old fuel oil advertising signs. EPA additionally noted that there were layers of what appeared to be metal-bearing boiler slag from a coal-fired boiler, suggesting that the area in question was a dump from previous businesses that operated at the site.

3.4.2 Performed by C.T. Male

C.T. Male performed a Ground Penetrating Radar (GPR) survey of the site, as conducted by Sub-Surface Information Surveys, Inc. The GPR survey was completed on April 4, 2002 in general accordance with the approved Work Plan. The GPR survey was completed in three specific areas of the site referred to as S-1, S-2 and S-3. The S-1 survey was north and east of the main tannery building between this building and the creek inclusive of the building slab of the former machine shop. The S-2 survey was north and west of the secondary tannery building between this building and the creek inclusive the building slab of the former storage building. The S-3 survey was generally the open area in the southeastern quadrant of the site. There were no other areas of the site (except those assessed by EPA) suspected to contain the presence of buried tanks or buried drums based on historical information. The GPR surveyed areas are depicted on the site map provided in Appendix 1 of the GPR Survey Results Report. The GPR

results did not identify signals consistent with buried underground features (tanks, dry wells, etc.), therefore, no further exploration of these areas was considered necessary. A copy of the May 6, 2002 Ground Penetrating Radar Survey Report as prepared by Sub-surface Informational Surveys, Inc. is provided as Exhibit 2.

3.5 Evaluation & Cleanup of Building Floor Drains

The floor drains within the main tannery building on the west side of the creek were not assessed by C.T. Male prior to building demolition. EPA reportedly cleaned out the residual sludge within the drainage system of this building (July 24, 2001 EPA Pollution Report #8). Analytical samples were collected for disposal purposes and the results showed elevated levels of chromium. Based on historic mapping of this building the drainage system consists of three separate trench drains, all of the which were connected to a pit, a settling tank and ultimately to the public sewer system. This mapping also shows a proposed wastewater treatment plant resembling the plant decommissioned by EPA. Regardless, the EPA data did not suggest that fluids collected within this drainage system discharged directly into the environment. In July 2001, EPA hand-shoveled floor drains within the main tannery building to remove the gross contamination (chromium contaminated sludge). Approximately three cubic yards of contaminated sludge were generated.

The floor drains within the secondary tannery building were observed by C.T. Male as this building remains. These drains were cleaned out and the entire building (i.e., walls, ceiling and floors) was pressure washed by EPA as detailed on EPA Pollution Reports #10 (August 23, 2001) and #11 (September 10. 2001).

Drainage systems were not apparent on the second floor of the secondary tannery building other then roof drains penetrating the floor at structural members which discharge to the drains on the first floor. The residual sludge removed from the drains was sampled by EPA for waste characterization and was properly disposed of by EPA under their Emergency Response Action.

A sump system was discovered by the EPA within secondary tannery building on the east side of the site. The sump was located along the northern wall of this building. The sump was apparently used to illicitly pump untreated floor drain wastes directly into an adjacent sewer manway located between the building and the creek. The sump

system is reported to have replaced the discharge of tannery wastes directly to the Cayadutta Creek.

The interior of the sewer manway was inspected by the EPA and gross chromium contamination of the manway was detected to a depth of 10 feet. A former underground settling chamber was discovered by the EPA as well as the outfall to the creek. The chamber was a device where the solid material settled and the liquid phase flowed over a weir and through the outfall into the creek. EPA subsequently sealed the outfall from the chamber with hydraulic cement. The interior of the manway was pressure washed and the connection point within the building was blind flanged and welded to prevent future use (September 2001).

3.6 Evaluation of Wastewater Pretreatment Plant

The wastewater pretreatment plant (WWTP) was located on the east side of the main tannery building. The WWTP basically consisted of three main chambers referred to as the surge chamber (EPA designated Lagoon 1), mixing chamber (EPA designated Lagoon 2) and the settling chamber (EPA designated Lagoon 3). According to an assessment of the WWTP by EPA on September 25, 2001 the following information was developed:

Lagoon 1: This was the first chamber and was approximately 14′ by 10′ in plan dimension. Lagoon 1 contained an estimated 4,787 gallons of liquid and 90 gallons of sludge.

Lagoon 2: This was the second chamber and was approximately 10′ by 15′ in plan dimension. Lagoon 2 contained an estimated 10,472 gallons of liquid and 187 gallons of sludge.

Lagoon 3: This was the last chamber and was approximately 47′ by 15′ in plan dimension. Lagoon 3 contained an estimated 20,197 gallons of liquid and 29,883 gallons of sludge. EPA sampled the sludge within this chamber and classified it as non-hazardous based on the TCLP analytical results.

EPA collected representative samples of the liquid and sludge phases of the WWTP on June 25, 2001. The analytical results for the liquid were apparently transmitted to Johnstown-Gloversville Joint WWTP as part of a request for a one-time discharge to

their plant. Based on the analytical results, however, chromium, copper and zinc levels within Lagoon 1 were too high and needed to be pre-treated prior to discharge to meet the wastewater discharge limits. EPA then treated liquid chromium wastes in the on-site treatment plant in September 2001 to precipitate chromium, zinc and copper. EPA treated 15,000 gallons of contaminated wastewater to meet discharge limits and then discharged it to the on-site sewer manhole at a controlled rate of less than 150 gallons per minute. An additional 25,000 gallons of untreated non-contaminated wastewater were also discharged to the sewer manhole.

After the liquids were discharged, the precipitated sludge was reportedly dried with lime and clean dirt and bulked for disposal. The remaining non-contaminated sludge was mixed with lime and clean dirt and used to backfill excavations during site restoration. EPA also scraped the accumulated chromium deposits off the foundation walls and bagged it for disposal. The interior of the WWTP was then power-washed and demolished down to grade. Most of the below grade portions of the WWTP was left in-place so as not to disturb the existing large diameter sewer trunk line that traverses the site immediately adjacent to the WWTP remains. The location and elevation of portions of the concrete pad, WWTP walls and other prominent features were surveyed by C.T. Male and are presented on the Boundary Survey (Figure 2).

3.7 Fish and Wildlife Impact Analysis (FWIA)

C.T. Male completed an Fish and Wildlife Impact Analysis (FWIA) pursuant to the October 1994 NYSDEC FWIA for Inactive Hazardous Waste Sites. The purpose of the Step 1 FWIA is to identify fish and wildlife resources that presently exist and that existed before contaminant introduction, or to document their absence. This step includes a site description and map reviews, description of fish and wildlife resources, description of fish and wildlife resource value, and identification of applicable fish and wildlife regulatory criteria. Information for the site and the vicinity of the site was collected during a field visit and during off-site literature and mapping reviews. Since potential site contaminants were identified within the creek sediment and may affect fish and wildlife resources on-site, a complete site description as outlined in Step I and II of the FWIA was completed. A copy of the FWIA is provided as Exhibit 3.

3.8 Asbestos Pre-Demolition Survey

EPA, as part of the Emergency Response Action, coordinated and completed the demolition activities at the site. Prior to demolition, select suspect asbestos containing materials (ACM) were apparently sampled and tested by EPA. In June 2001, EPA reportedly collected loose pieces of asbestos containing material from around the site and bulked them into a drum. The non-friable siding attached to the main tannery building was tested for asbestos analysis and contained Chrysotile at 8.8%. In August 2001, EPA analyzed 120 linear feet of pipe insulation containing 50% Chrysotile. As we understand, the friable ACM was abated prior to building demolition which commenced on August 9, 2001. The EPA removed approximately 200 linear feet of pipe insulation which was determined to be asbestos. The insulation was removed by covering the material in plastic, wetting it with surfactant, and placing it in double bags for disposal. The non-friable ACM was left in-place and removed as part of the building demolition. The asbestos material and the C& D debris was transported and disposed of at the Fulton County Landfill.

3.9 Evaluation of Transformers

There were two pad mounted transformer located on-site adjacent to the each other. The transformers were located southeast of the machine shop building, but on the west side of the stream. The transformers were mounted on a steel beam and situated between two wooden poles approximate three feet above the ground surface. EPA coordinated the removal and disposal of these units as part of their Emergency Response Action. EPA reported that the transformers contained 180 gallons of greater than 50 ppm PCB dielectric fluids.

3.10 Assessment of Building Materials

Twenty-eight wood tumblers were located within the site buildings, primarily in the main and secondary tannery buildings. Samples of the tumblers were collected for analysis and waste characterization. The analytical results revealed that only one tumbler was contaminated with chromium and was shipped to Fulton County landfill. The remaining non-contaminated tumblers were dismantled and shipped for recycling. Select structural and wood beams were also sampled and analytical results revealed no contamination. The wood beams and steel were sold to an individual for recycling.

The EPA sampled the dust in the baghouse from the leather shaving and buffing processes. The analytical results showed the six cubic yards of leather dust was not contaminated. The dust was transported off-site as non-hazardous solid waste.

Samples of soot from boiler stack for metals and dioxins. According to EPA's Pollution Report #12 dated September 28, 2001, the analytical results show no elevated levels of regulated metals, volatile organic aromatics or semi-volatile organic aromatics.

3.11 Site Wide Subsurface/Hydrogeologic Evaluation

The Subsurface/Hydrogeologic evaluation included the completion of eleven exploratory test borings. All of the test borings were converted monitoring wells upon completion of sampling. The locations of the test borings/monitoring wells are shown in the Site Map Showing Test Boring & Monitoring Well Locations (Figure 6). Nine of the monitoring wells (MW-5 through MW-12 and MW-14) were installed via conventional hollow stem augers and the remaining two wells (MW-13 and MW-15) were installed via Geoprobe drilling techniques. The Geoprobe unit was necessary for MW-13 and MW-15 as the drill rig could not access the interior of the secondary tannery building due to ceiling height limitations. Details of the monitoring well constructions are provided on the Monitor Well Construction Logs in Appendix B.

Soil samples were collected on a continuous basis (two foot intervals at the conventional test borings and at four foot intervals at the Geoprobe locations) for soil classification, PID screening, and potentially laboratory analysis. The soil classification for each boring/well is presented on the Subsurface Exploration Logs in Appendix C. All of the recovered soil samples were screened for the presence of volatile organic compound vapors with a PID. The PID screening results are presented on the Organic Headspace Analysis Logs in Appendix D. One soil sample from each test boring was secured for laboratory analysis based in part in the headspace screening results, and organoleptic perception of suspect contamination. In the event of no evidence of contamination, the soil samples closer to the ground surface were analyzed for assessment of the surface soil quality within the site.

3.12 Surface Soil, Creek Surface Water and Creek Sediment Sampling and Analysis

3.12.1 Performed by EPA

In 2001, EPA performed a soil contamination investigation as part of their Emergency Response Action to assess surface water, creek sediment and surface soil for contamination. EPA prepared a Final Report for this activity dated January 2002. The report summarizes the methods followed and the findings of the soil contamination investigation, a copy of which is presented in Volume I - EPA Reports. C.T. Male, in a February 20, 2002 letter to NYSDEC with copies to NYSDOH, summarized the work performed by EPA so that those agencies could determine if additional surface soil sampling and analysis would be required to satisfy the requirements for releases under the State Brownfield Program. The summary of EPA's work, as presented in the referenced letter is as follows:

EPA's site sampling program included the following work tasks. All sampling locations are shown on the Site Investigation Map (Figure 2 of EPA's Final Report for Soil Contamination Investigation, see Supplemental Volume III) and Figure 7 of this report (Site Plan Map Showing EPA Sampling Locations).

- Surficial soil samples were collected at forty-nine individual locations for total chromium analysis. Samples for total chromium were initially analyzed by X-Ray Fluorescence (XRF). Confirmation analysis for chromium was performed on approximately ten percent of the XRF samples by inductively coupled plasma (ICP) atomic emission spectroscopy.

- At six of the forty-nine surface sample locations, subsurface soil samples were collected for total chromium analysis from approximately five feet below ground surface. The subsurface samples were collected from sampling locations SSW-6, SSW-10, SSW-12, SSW-16, SSW-24 and SSW-37.

- Three sediment samples were collected along the lower banks of the Cayadutta Creek (on-site) for total chromium analysis. One sample was collected at the northern site boundary (SED-1), one at the mid-point location (SED-2), and one near the southern site boundary (SED-3).

- At six separate locations, surficial soil samples were collected for "expanded" analysis, which included TAL metals, TCL VOCs and TCL SVOCs. These sample locations were: SSW-9 (C.T. Male SS-1), SSW-19 (C.T. Male SS-2), SSW-31 (C.T. Male SS-3), SSW-42 (C.T. Male SS-4), SSE-4 and SSE-5 (C.T. Male SS-5).

EPA presented the concentrations of chromium by XRF on the attached site map (Figure 3 of the EPA report, see Supplemental Volume III). EPA also presented the concentrations of chromium by ICP and the mathematically adjusted XRF chromium concentrations on the attached site map (Figure 5 of EPA's Final Report, see Supplemental Volume III). As shown, chromium was detected at twenty-eight of the forty locations on the west side of Cayadutta Creek, and at six of the fifteen locations on the west side of Cayadutta Creek. All other locations were non-detect based on the analysis performed.

In general, the chromium concentrations were less than 531 mg/kg, except for SSW-25 (1,200 mg/kg), SSW-31 (1,400 mg/kg) and SSW-39 (930 mg/kg). These locations were generally south of the main tannery building. There was no chromium detected in the three sediment soil samples collected from Cayadutta Creek. It should be noted that the data presented in Figure 5 of the EPA's Final Report (see Supplemental Volume III) represents acid extractable chromium concentrations, which EPA indicated may be higher than those that would leach out of soils under normal environmental conditions.

Based on a preliminary review of the analytical results for those surface soil sampling locations subjected to expanded analyses, there appeared to be a few SVOCs above NYSDEC TAGM 4046 recommended soil cleanup objective values, generally one order of magnitude or less of their regulatory values. There also were several metals detected above laboratory method detection limits, with arsenic, chromium, mercury, nickel and zinc at levels in one or more samples above NYSDEC TAGM 4046 recommended soil cleanup objective values and normal background range found in Eastern United States Soils.

EPA's investigation appeared to have adequately evaluated the surficial soils relative to chromium, however, not the remaining TAL of metals. The evaluation of surface soils for TCL of volatiles, semi-volatiles and metals was less extensive and was not site wide, nor did it include TCL PCBs and pesticides. Therefore, C.T. Male collected additional surface soil samples, creek surface water and creek sediment samples for expanded

analyses to supplement the data provided by EPA, as approved by NYSDEC and NYSDOH. The results of the additional sampling completed by C.T. Male are summarized in Section 3.12.2.

3.12.2 Performed by C.T. Male

C.T. Male conducted surface soil, creek surface water and creek sediment sampling on May 10, 2002 to supplement EPA data. As shown on Figure 5, eight surface soil samples (SS-1 through SS-8) were collected across the site, and three surface water samples (SW-1 through SW-3) and three sediment samples (CS-1 through CS-3) were collected from the creek. Based on the flow direction in the creek, CS-1 and SW-1 are the upstream sample locations, CS-2 and SW-2 are in the middle of the site and CS-3 and SW-3 are the downstream creek sample locations. The surface soil samples were collected first. The samples from beneath the buildings (SS-2, SS-5, SS-6, SS-7 and SS-8) required concrete coring to allow for sample collection. Therefore, these samples were collected just below the concrete slab and subbase material where present. The remaining surface soil samples (SS-1, SS-3 and SS-4) were collected from undisturbed areas of the site in which the surface vegetation and root zone was removed prior to sample collection. The creek surface water samples were then collected followed by the sediment samples. The surface water samples were collected with a peristaltic pump and new polyethylene tubing. The creek sediment samples were collected using a hand auger, which was decontaminated between each sampling point. All of the sampling was collected from downstream to upstream locations as not to affect the sample integrity.

Accounting for the EPA generated data, the analysis of some of the surface soil samples was modified. Surface soil sampling locations SS-1 (EPA SSW-9), SS-2 (EPA SSW-19), SS-3 (EPA SSW-31), SS-4 (EPA SSW-42), SS-5 (EPA SSE-5) were only analyzed for TCL pesticides and PCB's and cyanide. Analysis of surface soil samples SS-6, SS-7 and SS-8 were expanded to also include TCL VOCs and SVOCs and metals. The creek surface water and sediment samples were analyzed for the TCL of VOCs, SVOCs, pesticides, PCBs, TAL metals and cyanide as per the approved Work Plan.

A summary of the results for the surface soil, creek surface water and creek sediment is provided below. Summary tables of the analytical results for surface water are also provided as Tables 5.2.2-1 through 5.2.2-4. Summary tables of the analytical results for

creek sediment are also provided as Tables 5.2.3-1 through 5.2.3-4. Summary tables of the analytical results for surface soil are also provided as Tables 5.3.2-1 through 5.3.2-4.

Surface Soil:

SS-1: Two pesticides (4,4'-DDD and 4,4'-DDT) were detected above the method and instrument detection limit (DL) at relatively low concentrations, but were below their NYSDEC TAGM 4046 recommended soil cleanup objective (RSCO) values. One PCB (Aroclor 1260) was detected above the method and instrument DL at a relatively low concentration and was below its NYSDEC RSCO value. Cyanide results were rejected and can't be used.

SS-2: No pesticides or PCBs were detected above the method or instrument DL. Cyanide results were rejected and can't be used.

SS-3: No PCBs were detected above the method or instrument DL. Three pesticides (beta-BHC, gamma-chlordane and dieldrin were detected above the method and/or the instrument DL, however, none were at concentrations exceeding their NYSDEC TAGM 4046 RSCO values. Cyanide results were rejected and can't be used.

SS-4: No pesticides or PCBs were detected above the method or instrument DL. Cyanide results were rejected and can't be used.

SS-5: No pesticides or PCBs were detected above the method or instrument DL. Cyanide results were rejected and can't be used.

SS-6: No PCBs were detected above the method or instrument DL. Seven pesticides were detected above the method and/or the instrument DL, however, none were at concentrations exceeding their NYSDEC TAGM 4046 RSCO values. Only two VOCs were detected (ethylbenzene and xylenes) above the method and instrument DL. These two VOCs exceed their NYSDEC TAGM RSCO values. Twelve SVOCs were detected above the method and/or instrument DL, five of which exceed their NYSDEC TAGM RSCO values. Several metals were detected above the method and instrument DL, seven of which exceed their NYSDEC TAGM RSCO values. Cyanide results were rejected and can't be used.

SS-7: No pesticides, PCBs, VOCs or SVOCs were detected above the method or instrument DL. Several metals were detected above the method and instrument DL, three of which exceed their NYSDEC TAGM RSCO values. Cyanide results were rejected and can't be used.

SS-8: No pesticides, PCBs or VOCs were detected above the method or instrument DL. Eighteen SVOCs were detected above the method and/or the instrument detection limit, five of which exceed exceed their NYSDEC TAGM RSCO values. Several metals were detected above the method and instrument DL, five of which exceed their NYSDEC TAGM RSCO values. Cyanide results were rejected and can't be used.

Creek Surface Water:

SW-1 No VOCs, SVOCs, pesticides, PCBs or cyanide were detected above the method or instrument DL. Several metals were detected above the method and instrument DL. Aluminum and iron were the only metals detected at concentrations that exceed their respective NYSDEC surface water standard values.

SW-2 No VOCs, SVOCs, pesticides, PCBs or cyanide were detected above the method or instrument DL. Several metals were detected above the method and instrument DL. None of the metals concentrations exceeded their respective NYSDEC surface water standard values.

SW-3 No VOCs, SVOCs, pesticides, PCBs or cyanide were detected above the method or instrument DL. Several metals were detected above the method and instrument DL. None of the metals concentrations exceeded their respective NYSDEC surface water standard values.

Creek Sediment:

CS-1 Only one VOC was detected (within the rerun sample) above the instrument DL. This VOC being 2-butanone, and was detected at a concentration below its NYSDEC TAGM RSCO value. Twenty SVOCs were detected above the method and/or the instrument DL. Of those detected, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were the only SVOCs detected at concentrations that exceed their respective NYSDEC TAGM RSCO values.

CS-2 No VOCs were detected above the method or instrument DL. Thirteen SVOCs, were detected above the method and/or instrument DL. Of those detected, benzo(a)pyrene and dibenzo(a,h)anthracene were the only SVOCs detected at concentrations which exceed their respective NYSDEC TAGM RSCO values.

CS-3 No VOCs were detected above the method or instrument DL. Sixteen SVOCs were detected above the method and/or instrument DL. Of those detected, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and dibenzo(a,h)anthracene were the only SVOCs detected at concentrations that exceed their respective NYSDEC TAGM RSCO values.

3.12 Closure of Petroleum, Chemical and Process Storage Tanks

3.12.1 General

Several storage and process tanks were located on-site. As part of EPA's Emergency Response Action, the tanks were cleaned, removed and disposed off-site. Independent Leather is registered twice as a Petroleum Bulk Storage facility (PBS#5-229423 and

PBS#5-463388) and also as a Chemical Bulk Storage facility (CBS#5-000057). The PBS listing for both registrations identifies one tank (Tank#001), with identical information listed except that the owner information is different and there is no installation date on one of the forms. It is inferred that this listing refers to the partially buried 20,000 gallon tank formerly containing No. 6 fuel oil. This tank was removed by EPA as explained in Section 3.14.2. As for the chemical bulk storage, two 2,000 gallon aboveground storage tanks (ASTs) containing aluminum sulfate and chromic sulfate were listed as being closed in-place in 1989 and 1993, respectively.

EPA interviewed a former maintenance supervisor of Independent Leather when he visited the site during the Emergency Response Action. EPA determined that no known underground storage tanks (USTs) were present at the site based on information provided. This former supervisor also indicated that there was a solvent above ground tank (AST) and a solvent still in the processing area of the secondary tannery building.

According to EPA's Pollution Report #16 dated June 1, 2002, a 750 gallon steel UST buried along the sidewalk along South Main Street was discovered by EPA while removing the former building foundation wall. EPA was unsure of removal, as it may have compromised the integrity of the adjacent sidewalk. However, after consulting with the City Department of Public Works the UST was removed by EPA. The UST was perforated, sampled, drained and power washed into a poly drum. The UST was then crushed and bulked for recycling and the contents were properly disposed off-site.

There were other ASTs located on-site prior to EPA completing their Emergency Response Action. These ASTs included a kerosene AST east of the main tannery building, three solvent ASTs south west of the secondary tannery building (in the area of the 20,000 gallon No. 6 oil AST) and five other ASTs of unknown use that were scattered about the site. Figure 4 depicts the approximate location of these ASTs.

An updated petroleum bulk storage application and a chemical bulk storage application were prepared and submitted to NYSDEC under separate cover. In summary, the City added the closure (by removal) of the 20,000 gallon No. 6 fuel oil AST, the 750 gallon UST, the kerosene AST, three solvent ASTs, and five other unknown use ASTs to the PBS application, and re-filed the CBS application to reflect the City's ownership and list the two 2,000 gallon ASTs aluminum sulfate and chromic sulfate as closed-removed.

Other miscellaneous storage of petroleum products included an oil reservoir associated with the former elevator. A total of fourteen 55 gallon drums of hydraulic oil were removed by EPA and properly disposed off-site.

3.13.2 Area of Former 20,000-gallon No. 6 Fuel Oil Tank

On August 7, 2002 EPA encountered the bottom 1/3 of a 20,000 gallon (20k) underground storage tank (UST) while repairing the creek banks at the site. The 20k UST encountered by EPA was located in the approximate center of the site on the east side of the creek. This tank was located in the reported area of the former 20k No. 6 Oil aboveground storage tank (AST) and three solvent ASTs. The tank had already been cut in half, longitudinally, at ground level, and the shell was filled with dirt. When EPA attempted to remove the remains, water and oil began to seep in the shell. Spill pads and boom were deployed in the creek as a contingency and the seepage eventually stopped. The seepage was collected into poly drums and based on analysis was subsequently dumped into the sewer system (approximately 60 gallons) as no contamination above background levels was observed.

The 20k UST was resting on a concrete slab approximate five feet below grade. There were also concrete masonry block walls constructed and attached to the concrete slab as if it was contained in a former building or foundation wall. The interior of the tank and the space between the tank and the building walls were filled with soil that was reportedly contaminated with oil. EPA removed the tank and the visually contaminated material above the concrete slab and block walls. The soil within the tank was reportedly staged on poly and bulked out with other contaminated soil (approximately 7 cubic yards). The soil underneath the tank was sampled by EPA and the analysis did not show contaminants so EPA replaced the underlying soil into the excavation.

On August 8, 2002 C.T. Male performed a site visit and free phase product (oil) was weeping through cracks in the foundation wall at a location in the northeast corner (at approximately five feet below grade). The origin and quantity of oil was unknown.

3.13 EPA Results of Field Sampling, Testing and Geochemical Modeling

At the request of EPA, Lockheed Martin conducted field sampling, testing and geochemical modeling at the Independent Leather site and prepared a Final Report summarizing these activities. A copy of the March 15, 2003 Final Report is included within Volume III, the Supplement to this SI Report. In June 2002, Lockheed Martin's Response, Engineering and Analytical Contract (REAC) personnel collected groundwater and shallow subsurface soil samples for chemical analysis and physical property testing. In addition, Lockheed Martin performed in-situ hydraulic conductivity tests in several on-site monitoring wells as a means for estimating the permeability of subsurface soils. For the geochemical modeling, the geochemical code MINTEQA2, Version 3.11 (USEPA, 1991) was used by Lockheed Martin to examine the chemical partitioning and potential mobility of chromium and arsenic in soils and groundwater at the site. MINITEQA is a geochemical equilibrium specification code, designed for aqueous systems, that calculates the mass distribution between dissolved, adsorbed, and multiple solid phases under a variety of conditions.

Within the report provided by EPA's subcontractor Lockheed Martin, the soil test results, the groundwater results, hydraulic conductivity test results, and geochemical model results are specifically discussed. The main focus of the study revolved around the geochemical behavior of chromium and arsenic in soil-groundwater environments in which the soil, groundwater and hydraulic conductivity testing provided the background information for geochemical modeling.

Chromium was modeled over a pH range of 6.5 to 7.5, similar to the range observed in on-site monitoring wells. The modeled Eh range extended from -250 mV to 500 mV with starting concentrations of dissolved chromium in excess of 6,000 mg/l for the model simulations. Lockheed Martin concluded that results from all model runs indicated that neither Cr^{3+} nor Cr^{6+} were present in any dissolved phases (i.e., at environmentally significant concentrations). Furthermore, the majority of chromium, which was Cr^{3+}, was associated with solid stable mineral phases; specifically chromite ($FeCr_2O_4$) and chromium oxide (Cr_2O_3) according to Lockheed Martin. Based on model simulations, Lockheed Martin concluded that chromium appears to be very stable within the soils at the site and the potential for leaching and mobilization is likely to be minimal.

Arsenic modeling results were not as definitive as the chromium results. Arsenic modeling results indicated that the majority of this metal is sorbed onto mineral grains within the site soils rather than occurring in mineral form. The free iron oxide content in the soils as coatings on mineral surfaces, will likely control the degree of arsenic sorption. Sorbed arsenic phases are less stable than the mineral phases of arsenic and are more sensitive to changes in environmental conditions. Additionally, most of the arsenic was found to occur as arsenite (Ar^{3+}), which is the more toxic form of arsenic according to Lockheed Martin. Model simulations apparently demonstrated that the amount of dissolved arsenic in groundwater is related to the concentration of adsorbed arsenic in soils. As dissolved arsenic increases, adsorbed arsenic will also increase, but only to a point where all of the available sorption sites on the mineral surfaces have become occupied. In the case of monitoring well MW-8 (the highest arsenic concentration in groundwater), the available sorption sites are likely approaching saturation, which explains the higher dissolved arsenic concentrations in groundwater relative to the other monitor wells that were examined.

In conclusion, EPA's subcontractor Lockheed Martin modeled arsenic and chromium for site specific conditions. Based on the supplemental information provided, it appears that the Lockheed Martin was confident that chromium appears to be very stable within the soils at the site and the potential for leaching and mobilization is likely to be minimal. Arsenic however, was not determined to be as stable based on modeling results. Arsenic was detected in groundwater at seven of the thirteen monitoring well locations (sampled by EPA) above NYSDEC groundwater quality standards.

4.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

4.1 Results of Study Area Investigation

A number of investigative tasks were completed by C.T. Male to characterize the project site. The results of the investigative tasks are supplemented with published literature including soil, bedrock, and aquifer mapping to further assess the physical characteristics of the project site. The physical characteristics of the site are discussed in the following sections. Where applicable, information collected and provided by EPA is also presented.

4.1.1 Surface Features

The surface features at the site have dramatically changed through the completion of this site investigation from early 2001 to late 2002. Historically (pre-2001), the western side of the site as separated from the eastern section of the site by Cayadutta Creek was improved with a four-story building with basement used as the main tannery building and a smaller detached maintenance building. There were loading docks on the south side of the building which lead to an upper and lower unpaved parking area. The parking lots were separated by a grassy gently sloping hill. The north side of the building provided another area of parking, a portion of which was paved (along road) and gravel surfaced (along creek). Limited landscaped areas of grass were also present on the north side of the building. There is and has always been a creek that flows through the site. There were three steel support wooden deck bridges crossing the creek. On the east side of the creek (pre-2001), there are two buildings, one being the secondary tannery building and the other is a smaller storage building. The balance of the land is relatively flat and either grass (generally the southeast corner of the site) or dirt covered (roadway around building). An aerial photograph (circa 1970's) of the site is presented as Figure 3 of this report, which shows the historical surface features of the site.

The site as of the date of this report has been significantly altered as a result of EPA's Emergency Response Action. No buildings remain on the west side of the creek. The floor slab and portions of the former wastewater treatment plant remain buried under approximately one to five feet of clean fill. The site has been regraded such that the

west side of the site is at grade elevation with South Main Street and gently slopes down to the elevation at the top of the creek embankment walls. The east side of the site remains similar in surface features as no fill was placed, however, vegetation was cleared from the southern portion of the east side of the creek and is now more open than before. The smaller storage building was demolished and the concrete floor slab remains.

4.1.2 Surface Water Bodies

The Cayadutta Creek flows through the site generally from north to south. The creek enters the site near the center line of the northern boundary and flows south until it bends to the east, exiting the subject property near the southeast corner. The creek continues underneath Hill Street. No other surface water bodies were observed on the subject site or within 0.25 mile from the subject site.

A natural spring was encountered by EPA on the west side of the site. After consulting with the City Department of public works, EPA constructed a device to capture and channel water from the natural spring to the adjoining creek. A septic system distribution box was placed over the head of the spring that is connected to 4-inch diameter PVC pipe with a flexible elbow joint. This piping was installed within a 75 foot long bed of crushed rock running to the creek. This setup was installed with the intent of minimizing or eliminated under-erosion and settling of backfill placed in this area of the site.

4.1.3 Surface Drainage Patterns

The direction of surface water runoff within the site generally follows the lay of the land within the site. On the west side of the site, surface water will runoff the grassy land and travel easterly to the Cayadutta Creek which bisects the site. On the west side of the creek, although the land is flatter, the surface water will also follow the lay of the land and enter the Cayadutta Creek to the west. There are no catch basins on-site to divert or alter the flow of water across the site. The Cayadutta Creek generally flows south. Overall, the adjoining properties to the north and east appear to be higher in elevation, and therefore, would tend to direct surface water toward the site.

4.1.4 Regional Geology

Based on a review of the Surficial Geologic Map of New York, Hudson Mohawk Sheet, surficial geology in the vicinity of the site is mapped as kame moraine and fluvial deltaic sand. Kame morain soils vary from boulders to sand with a variable thickness of 10 to 20 meters. Fluvial deltaic sands consist of fine sands ranging in thickness from 2 to 10 meters. As the scale of this map is large it may not be entirely accurate, and can not be solely relied upon for specific characterization of the site geology.

According to the Geologic Map of New York, Hudson Mohawk Sheet, bedrock in the vicinity of the site is mapped in the category of glacial and alluvial deposits with the underlying bedrock geology classified as unknown.

4.1.5 Site Soils

Based on a review of the 1971 General Soils Report of Fulton County, New York, prepared by U.S. Department of Agriculture, soils in the vicinity of the site are mapped as the Windsor Association. These soils are deep, excessively drained, strongly acid, coarse textured soils that have formed in deep sandy deposits on glacial outwash terraces. They occupy gently rolling areas, and in a few places, moderately steep slopes. Windsor soils have 2 to 2½ feet of rapidly permeable, strongly acidic to medium acid sand, loamy sand or loamy fine sand over sand derived mainly from sandstone fragments.

The site soils were explored through the advancement of eleven test borings across the site. A subsurface boring log for each test boring log performed for this project was prepared, as presented in Appendix C. The logs summarize and present the classifications of the subsurface soils, moisture content and other pertinent visual observations of the soil stratum for the site. The site soils, as classified by the Unified Soil Classification System at the time of test boring or test pit completion consists of the following different soil types.

- Fill material of variable composition from the surface to 4 to 14 feet below grade.
- Silty sand, sandy silt or sand and gravel at depths of 4 to 12 feet below grade.
- Glacial till or silt with embedded sand and gravel at depths of 8 to 16 feet below grade.

The fill materials encountered at the site consisted primarily of fine to coarse sand with less, but varying percentages of silt and gravel. The only exception to this at test borings MW-10 and MW-13 where the fill materials were primarily silt and fine sand, with minor percentages of gravel. In general, these soils were typically intermingled with coal, ash, cinders, wood, brick, concrete and organic matter. The fill composition and depth varied from one exploratory location to the next and was not encountered at each test pit or test boring location. It appears that the fill materials were more prevalent at the test locations completed within the western side of the site in the area of the main tannery building and immediately adjacent to this building.

The secondary soil units encountered at the site were silty sand, sandy silt with some level of intermingled gravel. These soil units were not necessarily present at all of the locations. Test borings MW-8, MW-9, MW-11, MW-12, MW-13 and MW-14 did encounter these soils at 4 to 12 feet, grade to 12 feet, 6 to 12 feet, 6 to 9 feet, 4 to 7.5 feet and from grade to 10 feet, respectively. The silty sand or sandy silt soils were consistently encountered beneath the fill materials, were limited in thickness, and were usually underlain by glacial till.

At depths generally 8 to 14 feet below grade, glacial till or silt with embedded sand and gravel or sand and gravel was encountered at a majority of the test borings. The glacial till was usually moist not wet, and the density of these soils was high. Sampler refusal was encountered on these dense soils at test borings MW-7 (15.4 feet), MW-8 (15.5 feet), MW-12 (15.3 feet) and MW-13 (11.5 feet).

4.1.6 Groundwater Characteristics

According to the map entitled "Unconsolidated Aquifers in Update New York, Hudson Mohawk Sheet" (Fischer and others, 1986), the subject site is located in an unconfined aquifer yielding more than 100 gallons per minute. However, this is not consistent with site data. This inconsistency is attributed to the scale of the map being large and the boundaries of the defined aquifer are approximate.

No community water supply wells are mapped within one mile of the subject site. Four community water supply sources are mapped between 1 and 2 miles of the subject site. These water sources are Hyde Park Water Works (wells), Johnstown City Water Works

(Cork Center & Cold Brook Reservoirs), Ko-Z Mobile Home Park 2 (Wells), and Woodland Estates (Wells).

Groundwater conditions were assessed by advancing exploratory test pits and test borings, and installation of permanent monitoring wells. The installation of groundwater monitoring wells allowed for the collection of static water level data. The water level depths were then converted to water table elevations based on a project benchmark. The project benchmark was a box cut on the southwest corner of concrete support for a car wash vacuum unit, at an assumed 102.72 feet in elevation. All of the monitoring wells (top of PVC casing and grade) were surveyed relative to this benchmark. The site Boundary Survey drawing (Figure 2) presents the ground and top of monitoring well elevations. It should be noted that the ground elevations presented within the site survey were applicable to the site prior to EPA backfilling the western portion of the site. Accordingly, approximate measurements were collected from the top of PVC casing to determine the new ground elevations. The old and new grade elevations are presented below along with the top of PVC casing elevations.

B-2: Top of PVC = 92.99'
Current Grade Elevation = 90.50'

B-3: Top of PVC = 93.16'
Current Grade Elevation = 91.08'

MW-5: Top of PVC = 99.29'
Grade Elevation Pre-2001 = 94.56'
Current Grade Elevation = 97.39'

MW-6: Top of PVC = 98.45'
Grade Elevation Pre-2001 = 92.06'
Current Grade Elevation = 93.95'

MW-7: Top of PVC = 102.94'
Grade Elevation Pre-2001 = 96.80'
Current Grade Elevation = 100.64'

MW-8: Top of PVC = 100.69'
Grade Elevation Pre-2001 = 95.13'
Current Grade Elevation = 96.19'

MW-9: Top of PVC = 101.47'
Grade Elevation Pre-2001 = 96.11'
Current Grade Elevation = 99.17'

MW-10: Top of PVC = 95.92'
Grade Elevation Pre-2001 = 92.97'
Current Grade Elevation = 94.72'

MW-11: Top of PVC = 93.79'
Current Grade Elevation = 90.94'

MW-12: Top of PVC = 93.92'
Current Grade Elevation = 90.61'

MW-13: Top of PVC = 90.96'
Current Top of Slab Elevation = 91.09

MW-14: Top of PVC = 103.34'
Current Grade Elevation = 100.31'

MW-15: Top of PVC = 90.23'
Current Top of Slab Elevation = 90.17'

Water level measurements were collected from the monitoring wells on April 30, May 30 and June 12, 2002. Based on water level data, the water table across the site two-inch diameter wells was approximately 3 to 11 feet below existing site grades for those locations outside the main building. The groundwater elevations within the smaller diameter monitoring wells (MW-13 and MW-15) installed inside the secondary tannery building were on the order of 1 to 3 feet below the top of the concrete floor. The water level data was used to create groundwater contour maps. The contour maps are presented as Figures 9, 10 and 11. The contour maps depict groundwater flow to be converging toward the Cayadutta Creek with easterly and westerly flow components, respectively.

Field observations and parameters (pH, conductivity, and temperature) were recorded during the groundwater sampling event completed in May 2002. Field observations and parameters were recorded on Groundwater Services Field Logs and are presented in Appendix D. Sampling personnel noted the recharge rates for the monitoring wells to be adequate so that no wells went dry. The pH for the groundwater samples

collected were near neutral at 6.53 to 7.78 standard units at temperatures ranging from 7.2° to 14.2° Celsius. The conductivity for the groundwater samples ranged from 234 to 1,688 µS. Turbidity values for the groundwater sampling event were monitored prior to collecting the analytical samples. Turbidity values were generally below 50 NTU with the exception of MW-13 and MW-15. These two wells with higher turbidity values were the small diameter wells installed within the remaining building which due to the technique in which they were installed (Geoprobe) did not allow for formal placement of a sand pack. The table below lists the turbidity values for each well prior to sample collection. In most cases, extra sample volume was purged (i.e., more than five well volumes) and the flow was reduced in an effort to lower the turbidity values.

Table 5.1.6.1
Summary of Field Observations

Well ID	Turbidity [1]	pH & Temp.	Specific Conductance	Well ID	Turbidity	pH & Temp.	Specific Conductance
B-2	12.8 NTU	6.68 @ 10.2°C	705 µs	MW-10	28.3 NTU	6.70 @ 11.1°C	293 µs
B-3	10.2 NTU	7.20 @ 10.2°C	1,018 µs	MW-11	28.5 NTU	7.34 @ 11.3°C	580 µs
MW-5	11.7 NTU	7.41 @ 11.5°C	1,111 µs	MW-12	40.4 NTU	6.97 @ 9.1°C	291 µs
MW-6	44.5 NTU	7.78 @ 10.9°C	521 µs	MW-13	153 NTU	7.43 @ 9.4°C	1,579 µs
MW-7	10 NTU	6.53 @ 12.1°C	1,688 µs	MW-14	20.1 NTU	7.23 @ 13.7°C	850 µs
MW-8	23.5 NTU	7.03 @ 13.2°C	234µs	MW-15	138 NTU	7.21 @ 7.2°C	1,207 µs
MW-9	28 NTU	6.83 @ 14.2°C	860 µs				

[1] – A LaMotte Model 2008 Turbidity Meter was used. Turbidity readings were collected after purging, but before collecting laboratory samples.

5.0 NATURE AND EXTENT OF CONTAMINATION

5.1 Sources

Historical potential sources of contamination were identified within the site during the completion of the site investigation. These potential sources included abandoned drums and storage tanks containing tannery process chemicals and petroleum products, a pretreatment wastewater treatment plant, transformers and building floor drains. However, and as explained within the body of this report, EPA addressed/remediated these potential sources as part of a Emergency Response Action performed on-site at the time C.T. Male was conducting the site investigation activities. Therefore, site conditions were readily changing throughout the completion of this project. The site investigation activities completed by C.T. Male remained focused to these potential sources (even if there were already addressed/removed by EPA) to evaluate the quality of various types of media (i.e., soil, groundwater) at the site. The results of the investigative activities are discussed within the following sections. Based on our understanding of the site conditions, there are no potential active sources of contamination remaining at the subject site, however, residual contamination within the site remains.

5.2 Surface Water & Sediments

5.2.1 General

Surface water and sediment samples were collected by C.T. Male from three locations within the creek as described in Section 3.13.2. EPA also collected sediment samples from three locations along the creek, but limited the analysis to chromium as described in Section 3.13.1. The samples collected by C.T. Male were analyzed for TCL VOCs and SVOCs, PCBs, pesticides and cyanide, and TAL metals. The analytical results of detected compounds and analytes relative to NYSDEC standard and guidance values are discussed in the following paragraphs.

For the purpose of comparison, Class C standard and guidance values of the NYSDEC Ambient Water Quality Standards and Guidance Values reference document were utilized for the surface water samples. The sediment sample results were compared to

NYSDEC TAGM 4046 Determination of Soil Cleanup Objectives and Cleanup Levels (April 1995) and NYSDEC Technical Guidance for Screening Contaminated Sediments (latest revision January 25, 1999).

5.2.2 Surface Water

Analytical summary tables were prepared for the VOCs, SVOCs, pesticides/PCBs and metals analyses for surface water samples. These tables are numbered 5.2.2-1, 5.2.2-2, 5.2.2-3 and 5.2.2-4, respectively and are presented within this section of the report.

As shown in analytical summary tables, no VOCs, SVOCs, pesticides or PCBs were detected above their applicable SCGs for the three surface water samples. Of the metals detected in surface water samples, aluminum and iron were the only metals exceeding their SCGs. Aluminum was detected at SW-1 (the upstream location) at a concentration of 202 ug/L, which is above its SCG of 100 ug/L. Aluminum concentrations within the other two downstream locations were non detect at an instrument detection limit of 500 ug/L. This means that aluminum could possibly be present within those samples at a concentration less than 500 ug/l. Therefore, no conclusion can be drawn as to the source (off-site or on-site) of the aluminum at SW-1. In addition, it is inferred that if the concentration is less than 500 ug/L at the two downstream locations, then the concentrations are within the same magnitude and don't suggest aluminum to be a contaminant of concern. Iron was also detected at SW-1 (the upstream location) at a concentration of 393 ug/L, which is above its SCG of 300 ug/L. The concentrations of iron within the two downstream locations were 195 and 221 ug/L, which suggests that the elevated iron may be from an upstream source and not a contaminant of concern.

5.2.3 Sediment

Analytical summary tables were prepared for the VOCs, SVOCs, pesticides/PCBs and metals analyses for sediment samples. These tables are numbered 5.2.3-1, 5.2.3-2, 5.2.3-3 and 5.2.3-4, respectively and are presented within this section of the report.

As presented in the analytical summary tables, no VOCs, pesticides or PCBs were detected above their applicable SCGs for the three sediment samples collected and analyzed. Of the SVOCs detected, seven SVOCs were detected at concentrations that exceed their SCGs. Benzo(a)anthracene was detected within each of the three sediment samples at 2.7 mg/kg (CS-1), 0.14 mg/kg (CS-2) and 1.1 mg/kg (CS-3), two of which

were above its SCG of 0.224 mg/kg. Benzo(a)pyrene was detected within each of the three sediment samples at 2.6 mg/kg (CS-1), 0.14 mg/kg (CS-2) and 0.97 mg/kg (CS-3), all of which were above its SCG of 0.061 mg/kg. Benzo(b)fluoranthene was detected within each of the three sediment samples at 2.4 mg/kg (CS-1), 0.15 mg/kg (CS-2) and 0.81 mg/kg (CS-3), two of which were above its SCG of 0.224 mg/kg. Benzo(k)fluoranthene was detected within each of the three sediment samples at 2.2 mg/kg (CS-1), 0.14 mg/kg (CS-2) and 0.77 mg/kg (CS-3), two of which were above its SCG of 0.224 mg/kg. Chrysene was detected within each of the three sediment samples at 3.5 mg/kg (CS-1), 0.2 mg/kg (CS-2) and 1.3 mg/kg (CS-3), only one of which was above its SCG of 0.4. Dibenzo(a,h)anthracene was detected within each of the three sediment samples at 0.93 mg/kg (CS-1), 0.056 mg/kg (CS-2) and 0.31 mg/kg (CS-3), all of which were above its SCG of 0.014 mg/kg. Indeno(1,2,3-cd)pyrene was detected within each of the three sediment samples at 2.8 mg/kg (CS-1), 0.15 mg/kg (CS-2) and 0.89 mg/kg (CS-3), only one of which was above its SCG of 0.4 mg/kg. Considering these analytical results, the highest concentrations of these compounds were within the upstream location. The concentrations were lower within the downstream samples even though in some instances they still exceeded its SCGs at the downstream locations. Furthermore, when comparing the concentrations of these compounds to the NYSDEC water quality sediment criteria, only the concentrations within the upstream sample were elevated above SCGs. This suggests that the source of these contaminants, if any, may be from an upstream source and are not considered contaminants of concern.

Metals are naturally occurring in the environment and soils, but several were also commonly used by the tanning industry. Of those metals detected in sediment, copper, iron and zinc were the only analytes that were detected at concentrations that exceed their SCGs, as discussed in the following paragraphs. Typical background levels reported in Eastern USA soils and NYSDEC Sediment Criteria are also discussed.

Copper was detected within each of the three sediment samples at concentrations of 33.8 mg/kg (CS-1), 7.9 mg/kg (CS-2) and 25.8 mg/kg (CS-3), two of which were above its SCG of 25 or site background. The copper concentrations were within the NYSDEC TAGM Eastern USA background concentration range of 1 to 50 mg/kg. The concentrations of copper were below its NYSDEC Sediment Criteria of 16 ug/g (lowest effect level) and 110 ug/g (severe effect level) except for CS-1 and CS-3. Copper concentrations at these locations were 33.8 mg/kg and 25.8 mg/kg, respectively, which

are only slightly above its lowest effect level, therefore, based on this criterion the sediment impact is considered moderate on the basis of human health bioaccumulation.

Iron was detected within each of the three sediment samples at concentrations of 8,780 mg/kg (CS-1), 11,800 mg/kg (CS-2) and 8,770 mg/kg (CS-3), all of which were above its SCG of 2,000 mg/kg or site background. The iron concentrations were within the NYSDEC TAGM Eastern USA background concentration range of 2,000 to 550,000 mg/kg. The concentrations of iron at each of the three locations were below its NYSDEC Sediment Criteria of 2% or 20,000 ug/g (lowest effect level) and 4% or 40,000 ug/g (severe effect level), and is not considered contaminated on the basis of human health bioaccumulation.

Zinc was detected within each of the three sediment samples at concentrations of 99.5 mg/kg (CS-1), 47.5 mg/kg (CS-2) and 55.3 mg/kg (CS-3), all of which were above its SCG of 20 mg/kg or site background. The zinc concentrations were slightly higher (but within the same order of magnitude) than the NYSDEC TAGM Eastern USA background concentration range of 9 to 50 mg/kg. The concentrations of zinc at each of the three locations were below its NYSDEC Sediment Criteria of 120 ug/g (lowest effect level) and 270 ug/g (severe effect level), and is not considered contaminated on the basis of human health bioaccumulation.

5.3 Surface Soils

5.3.1 General

As described in Section 3.13.2, eight surface soil samples (SS-1 through SS-8) were collected across the site to supplement the analytical data EPA provided relative to surface soil sampling and analysis. The proposed parameters to be analyzed for in surface soil samples SS-1 through SS-5 were reduced to accound for the analyses performed by EPA at these locations. NYSDEC approved the reduction of the parameters for these select samples. The analytical results from the work performed by EPA is presented in Section 3.12.1. The analytical results from the work performed by C.T. Male is discussed in the following sections.

Analytical summary tables were prepared for the VOCs, SVOCs, pesticides/PCBs and metals analyses for surface soils. These tables are numbered 5.3.2-1, 5.3.3-1, 5.3.4-1 and 5.3.5-1, respectively and are presented within this section of the report.

5.3.2 Volatile Organic Compounds in Surface Soil

Three of the eight surface soil samples collected (SS-6, SS-7 and SS-8) were analyzed for VOCs. The analytical results show that ethylbenzene and total xylenes were the only compounds detected above the laboratory method detection limits at concentrations of 40 mg/kg and 33 mg/kg, respectively. These concentrations exceed their NYSDEC RSCO values of 5.5 mg/kg for ethylbenzene and 1.2 mg/kg for total xylenes.

Six of the numerous surface soil samples (SSW-9, SSW-19, SSW-31, SSW-42, SSE-4 and SSE-5) collected by the EPA were subjected to VOCs analysis. Based on a review of EPA's analytical results, no VOCs were detected above the laboratory method detection limits except a few compounds at SSE-5, which is the located beneath the northeast corner of the secondary tannery building. The VOCs detected at this location were ethylbenzene at 0.037 mg/kg, p&m-xylene at 0.29 mg/kg, o-xylene at 0.15 mg/kg, isopropylbenzene at 0.0066 mg/kg, n-propylbenzene 0.029 mg/kg, 1,3,5-trimethylbenzene 0.056 mg/kg, 1,2,4-trimethylbenzene 0.30 mg/kg, sec-butylbenzene at 0.12, and p-isopropyltoluene at 0.21. The concentrations of these VOCs are below their respective NYSDEC TAGM 4046 RSCO values.

5.3.3 Semi-Volatile Organic Compounds in Surface Soils

The analytical results indicate that two of the three surface soil samples (SS-6 and SS-8) did contain SVOCs above the method or instrument detection limit. The analytical results for SS-7 did not detect SVOCs above the method or instrument detection limit. Surface soil sample SS-6 was taken from beneath the central portion of the concrete floor in the secondary tannery building. Surface soil sample SS-8 was taken from beneath the southern portion of the floor in the main tannery building. In total, seventeen individual SVOCs were identified and detected within SS-6 and SS-8 at relatively low concentrations within the three samples. In most cases, the SVOCs were detected below the method detection limit, but above the instrument detection limit and therefore, are qualified as estimated values. Of those seventeen SVOCs detected, ten SVOCs were detected above their NYSDEC TAGM RSCO values. The SVOCs that

exceeded standard values were benzo(a)anthracene and benzo(a)pyrene (SS-6 and SS-8), benzo(b)fluoranthene (SS-8), benzo(k)fluoranthene (SS-8), chrysene (SS-6), dibenzo(a,h)anthracene (SS-8), 2-methylnaphthalene (SS-6) and naphthalene (SS-6).

Six of the surface soil samples (SSW-9, SSW-19, SSW-31, SSW-42, SSE-4 and SSE-5) collected by EPA were subjected to expanded analysis to include analysis for SVOCs. Based on a review of EPA's analytical results, no SVOCs were detected above the laboratory method detection limits except at SSE-4, SSW-9, SSW-19 and SSW-31. The same five SVOCs (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and indeno(1,2,3-cd)pyrene) exceeded their respective NYSDEC recommended soil cleanup objective value at SSE-4, SSW-9 and SSW-19. It should be noted that based on EPA mapping, surface soil sampling location SSE-4 appeared to be collected from an upgradient and off-site location with respect to the site boundaries, and the concentrations of these referenced SVOCs were similar at all of these locations. However, the sample appears have been collected from the area where the former railroad tracks were once located.

5.3.4 Pesticides and PCBs in Surface Soils

No pesticides were detected above the method and instrument detection limits except for three of the eight sampling locations (SS-1, SS-3 and SS-6). Sampling locations SS-1 and SS-3 are located on the west side of the creek and sampling location SS-6 is beneath the floor of the secondary tannery building. Two pesticides (4,4'-DDD and 4,4'-DDT) were detected at SS-1. Three pesticides (beta-BHC, gamma-chlordane and dieldrin) were detected at SS-3. Six pesticides (alpha-BHC, alpha-chlordane, gamma-chlordane, 4,4'-DDD, 4,4'-DDE, and endrin keytone) were detected at SS-6. The concentrations of the detected pesticides were relatively low with the majority being detected below the method detection limit, but above the instrument detection limit thereby qualifying them as estimated values. None of the detected pesticides exceeded their respective NYSDEC TAGM 4046 RSCO values. EPA did not analyze any samples for pesticides as part of their site work.

No PCBs were detected above the method and instrument detection limits except for one of the eight sampling locations (SS-1). Aroclor 1260 was detected at 0.022 mg/kg, below its NYSDEC TAGM 4046 RSCO value of 1.0 mg/kg. Surface sampling location

SS-1 was located adjacent to and on the west side of the creek. EPA did not analyze any samples for PCBs as part of their work performed on the site.

5.3.5 Metals in Surface Soils

Three of the eight surface soil samples collected (SS-6, SS-7 and SS-8) were analyzed for TAL metals. The majority of the metals included in the TAL analysis were detected above the method and/or the instrument detection limits, although not every metal was detected in each surface soil sample. Metals are naturally occurring in the environment and soils, but several were also commonly used by the tanning industry. The ensuing paragraphs individually discuss each detected metal with respect to guidance values and typical background levels reported in Eastern USA or New York State soils.

Aluminum was detected within each of the three surface soil samples above the method detection limit in a range of 4,590 to 11,200 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for aluminum and 33,000 mg/kg is the NYSDEC TAGM 4046 Eastern USA background value. As such, the concentrations of aluminum are below its typical background concentration in Eastern USA soils. It is therefore inferred that aluminum concentrations at the site are normal site background levels. The concentrations of aluminum within the six samples collected and analyzed by EPA were in a range of 2,900 to 6,900 mg/kg, which is similar to the levels detected by C.T. Male, and also below typical background concentrations in Eastern USA soils.

Antimony was detected within two of the three surface soil samples above the method detection limit in a range of 4 to 7.8 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for antimony and there is no numeric NYSDEC TAGM 4046 Eastern USA background value for this metal. With no background value to compare to it is assumed that antimony is at normal site background as the detected concentrations are similar. Antimony was not detected above the method detection limit for the six samples collected and analyzed by EPA.

Arsenic was detected within each of the three surface soil samples at varying concentrations above the method/instrument detection limit. Arsenic was detected at 3,510 mg/kg at SS-6, 5.1 mg/kg at SS-7, and 987 mg/kg at SS-8. Sample SS-6 was collected beneath the floor slab of the secondary tannery building, and samples SS-7

and SS-8 were collected from beneath the floor slab of the main tannery building. Considering the NYSDEC TAGM 4046 RSCO value of 7.5 mg/kg or site background, and the typical background concentration for New York State soils of 3 to 12 mg/kg, arsenic appears to be elevated at SS-6 and SS-8. Arsenic containing compounds were commonly used in the tannery industry and past use of this metal within the site buildings could have caused elevated levels to exist in the surface soil at these referenced locations. Arsenic was also detected within each of the six surface soil samples collected and analyzed by EPA. The concentrations were notably lower and in a range of 2.1 to 63 mg/kg with three samples higher than the typical background levels in New York State soils for arsenic.

Barium was detected within each of the three C.T. Male surface soil samples, above the method detection limit and in a range of 21.5 to 145 mg/kg. These concentrations were below their NYSDEC TAGM 4046 RSCO of 300 mg/kg or site background, and below the typical background range for Eastern USA soils. The concentrations of barium within the six samples collected and analyzed by EPA were in a range of 13 to 150 mg/kg, which are similar to the levels detected by C.T. Male.

Beryllium was detected within one of the three C.T. Male surface soil samples, above the instrument detection limit at 1.5 mg/kg. This concentration is above its NYSDEC TAGM 4046 RSCO value of 0.16 mg/kg or site background for this metal, but within the typical background range in Eastern USA soils of 0 to 1.75 mg/kg. Since there is no known use of beryllium historically at the site, beryllium is considered to be within normal background levels at the site. Beryllium was not detected above the method detection limit for the five of the six samples collected and analyzed by EPA. Beryllium was detected at 1.1 mg/kg within EPA's surface soil sample SSW-19, which is similar to the detections described above.

Chromium was detected within each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations of 605 mg/kg (SS-6), 63.3 mg/kg (SS-7), and 73.1 mg/kg (SS-8). With a NYSDEC TAGM 4046 RSCO value of 50 mg/kg and the NYSDEC TAGM 4046 New York State background level of 1.5 to 40 mg/kg, the concentrations of chromium appear to abnormally higher at SS-6 and slightly elevated at SS-7 and SS-8. Chromium containing compounds were commonly used in the tannery industry and past use of this metal within the buildings could have caused elevated levels to exist in the surface soil at these referenced locations. Chromium was

also detected within the six surface soil samples collected by EPA at a concentration of 26 mg/kg (SSE-4), 8.8 mg/kg (SSE-5), 220 mg/kg (SSW-9), 110 mg/kg (SSW-19), 1,400 mg/kg (SSW-31) and 36 mg/kg (SSW-42). Again, the concentrations of chromium at SSW-9 and SSW-19 were slightly elevated and abnormally high at SSW-31.

Copper was detected within each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations of 123 mg/kg (SS-6), 20.6 mg/kg (SS-7), and 25 mg/kg (SS-8). With a NYSDEC TAGM 4046 RSCO value of 25 mg/kg or site background, and a NYSDEC TAGM 4046 Eastern USA background levels being 1 to 50 mg/kg, these concentrations of copper appear to be normal background levels except for SS-6. Copper related compounds may have been used in leather dying. Copper was also detected within each of the six surface soil samples collected and analyzed by EPA, within the range of 2.4 to 21 mg/kg. The analytical results from EPA are similar to the concentrations detected within surface soil samples SS-7 and SS-8 collected and analyzed by C.T. Male, and were also within the typical background levels for copper in Eastern USA soils.

Cyanide was analyzed for each of the eight surface soil samples collected by C.T. Male. However, due to quality control review the results were rejected by the data validator and are unusable.

Iron was detected within each of the three C.T. Male surface soil samples, above the method detection limit at concentrations ranging between 8,110 and 30,400 mg/kg. Although this range of concentrations is greater than the numeric NYSDEC TAGM 4046 RSCO value for iron, the concentrations are within the typical background levels for iron in Eastern USA soils. Iron oxide may have been used as a leather dying agent (red). Iron was also detected within each of the six surface soil samples collected and analyzed by EPA within the range of 7,000 to 34,000 mg/kg. The analytical results from EPA are similar to those of C.T. Male's, and were also within the typical background levels for iron in Eastern USA soils.

Lead was detected within each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations between 45.6 to 123 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for lead, this range is within and below the background range established by that guidance document (200 to 500 mg/kg). Lead was also detected within each of the six surface soil samples collected

and analyzed by EPA within the range of 11 to 350 mg/kg. The analytical results from EPA are similar, and slightly higher in some cases to those lead concentrations detected within the samples collected and analyzed by C.T. Male. The EPA lead results were also within the typical background levels for lead.

Magnesium was detected at each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations between 931 to 7,900 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for magnesium, this range is within the typical background range for Eastern USA soils. Magnesium was also detected within each of the six surface soil samples collected and analyzed by EPA within the range of 1,500 to 6,500 mg/kg. The analytical results from EPA are similar to those magnesium concentrations detected within the samples collected and analyzed by C.T. Male, and were also within the typical background levels for magnesium.

Manganese was detected within each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations between 83.2 to 241 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for manganese, this range is within the typical background range for Eastern USA soils. Manganese was also detected within each of the six surface soil samples collected and analyzed by EPA within the range of 78 to 270 mg/kg. The analytical results from EPA are similar to those manganese concentrations detected within the samples collected and analyzed by C.T. Male, and were also within the typical background levels for manganese.

Mercury was detected above its NYSDEC TAGM 4046 RSCO value at two of the three C.T. Male surface soil sample locations (SS-6 and SS-8). Mercury was not detected above the method and instrument detection limit at the third location (SS-7). The concentrations of mercury were also above the typical background range of mercury within Eastern USA soils at these two locations (SS-6 and SS-8). The analytical results from EPA are similar to the concentration of mercury detected at SS-8, and in the range of 0.043 to 0.4 mg/kg. The normal background concentration for mercury is unknown. The concentration of mercury at sampling point SS-8 appears to be higher than at all other sampling locations. Mercury based compounds in the form of biocides or fungicides may have historically been used by the tannery.

Nickel was detected within each of the three C.T. Male surface soil samples at concentrations of 34.8 mg/kg (SS-6), 5.6 mg/kg (SS-7) and 11.7 mg/kg (SS-8). The

concentration of nickel at SS-7 was the only location which exceeded its NYSDEC TAGM 4046 RSCO value and was greater than the range of typical background concentrations of this metal in Eastern USA soils. The analytical results for the six EPA surface soil samples ranged between 3.6 to 79 mg/kg. Since there is no known historical source of nickel at the site, nickel levels at the site are considered to be within normal background levels.

Potassium was detected within each of the three C.T. Male surface soil samples at varying concentrations above the method detection limit. Potassium was detected at 1,360 mg/kg at SS-6, 940 mg/kg at SS-7, and 622 mg/kg at SS-8. With no numeric NYSDEC TAGM 4046 RSCO value and the typical background concentration for New York State soils of 8,500 to 43,000 mg/kg, the detected concentrations of potassium are below the typical background concentrations in New York State soils. The analytical results for the six EPA surface soil samples ranged between 350 to 800 mg/kg, similar to and less than those results of surface soil samples collected and analyzed by C.T. Male.

Sodium was detected at each of the three C.T. Male surface soil samples, above the method detection limit and at concentrations between 304 to 541 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for sodium, this range is below the typical background range for Eastern USA soils. Sodium was also detected within each of the six surface soil samples collected and analyzed by EPA at a range of 64 to 1,400 mg/kg. The analytical results from EPA are similar to and slightly higher than those detected within the samples collected and analyzed by C.T. Male, and are also below the typical background levels for sodium.

Vanadium was detected within each of the three C.T. Male surface soil samples above, the method detection limit at concentrations of 19.2 mg/kg (SS-6), 11.5 mg/kg (SS-7), and 18.5 mg/kg (SS-8). With the NYSDEC TAGM 4046 RSCO value of 150 mg/kg or site background and the NYSDEC TAGM 4046 Eastern USA background levels being 9 to 50 mg/kg, these concentrations appear to be within normal background levels. Vanadium was also detected within each of the six surface soil samples collected and analyzed by EPA, within the range of 10 to 180 mg/kg. The analytical results from EPA are similar to those detected within surface soil samples collected and analyzed by C.T. Male except for SSW-9, SSW-19 and SSW-31 which are slightly higher, but still within the typical background levels for vanadium in Eastern USA soils.

Zinc was detected above the method detection limit at 255 mg/kg at SS-6, 90.2 mg/kg at SS-7 and 56.3 mg/kg at SS-8. Zinc was detected with each of the three surface soil samples above its NYSDEC TAGM 4046 RSCO value. The concentrations were also slightly above the typical background concentration for zinc in Eastern USA soils. The analytical results from the six surface soil samples collected and analyzed by EPA ranged in concentration from 21 to 990 mg/kg, which are slightly higher than those collected and analyzed by C.T. Male. In most cases, the EPA's results show zinc to be above NYSDEC TAGM 4046 RSCO values and above typical background levels in Eastern USA soils. Zinc based compounds may have been used by the tannery as a leather dying agent.

5.4 Subsurface Soils

5.4.1 General

Eleven soil borings were advanced as part of the site investigation performed by C.T. Male. Of those advanced, ten subsurface soil samples were selected, one from each boring per the approved work plan except for soil boring MW-15. Soil boring MW-15 was not anticipated, but was added to the scope as EPA encountered elevated PID readings beneath the floor slab of the Secondary Tannery Building. Soil boring MW-15 was advanced in the area of the high PID readings to obtain additional PID screening data and to facilitate the installation of a small diameter monitoring well for the purpose of securing a groundwater sample. Therefore, no soil sample was analyzed from MW-15.

The selection of soil samples for laboratory analysis was based on the soil screening results with the PID and visual observations of evidence of contamination. As per the approved work plan, one soil sample from each soil boring with the highest PID reading was subjected to laboratory analysis. In the absence of the elevated PID readings, the soil sampling interval near the ground surface was subjected to laboratory analysis. The samples were analyzed for the TCL of VOCs and SVOCs, PCBs, Pesticides and Cyanide, and TAL metals. The subsurface soil samples were collected from various locations and depths (generally from 0 to 6 feet below grade) across the site to evaluate the quality of the subsurface soil at the site. The analytical results are discussed in the following subsections.

Analytical summary tables were prepared for the VOCs, SVOCs, pesticides/PCBs and metals analyses for subsurface soil samples. These tables are numbered 5.4.2-1, 5.4.3-1, 5.4.4-1 and 5.4.5-1, respectively and are presented within this section of the report.

5.4.2 Volatile Organic Compounds in Subsurface Soils

A total of ten VOCs were detected above the detection limits at relatively low levels within the soil samples collected and analyzed from five of the soil boring locations. The VOCs detected were acetone, benzene, 2-butanone, carbon disulfide, ethylbenzene, methylene chloride, tetrachloroethene, toluene, vinyl chloride and total xylenes, not all of which were detected at every location as described below:

- acetone and methylene chloride at soil boring MW-7;
- carbon disulfide at soil boring MW-8;
- acetone, benzene, 2-butanone, carbon disulfide, ethylbenzene, toluene and total xylenes at soil boring MW-10;
- acetone, 2-butanone, carbon disulfide, methylene chloride, and vinyl chloride at soil boring MW-11; and
- acetone, 2-butanone, ethylbenzene, tetrachloroethene, toluene, and total xylenes at soil boring MW-13.

No other VOCs were detected above the method and instrument detection limits in the remaining soil samples submitted for analyses. None of the VOCs detected were at concentrations above their respective NYSDEC TAGM 4046 RSCO values, except acetone within the soil samples collected from MW-10, MW-11 and MW-13 at a concentrations of 0.75, 0.37 and 0.3 mg/kg, respectively.

5.4.3 Semi-volatile Organic Compounds in Subsurface Soils

Twenty-two SVOCs were detected at relatively low levels within soil samples collected from eight boring locations, most of which were below the method detection limit and at estimated concentrations. Although not all SVOCs were detected within each sample, they included acenaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, carbazole, 4-chloro-3-methylphenol, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-methylnaphthalene, 4-methylphenol, naphthalene, pentachlorophenol phenanthrene,

and pyrene. Only six of the twenty two detected compounds exceeded their NYSDEC TAGM 4046 RSCO values at three or less locations as follows:

- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and chrysene exceeded their SCGs at MW-8 (2-4'), MW-10 (4-6') and MW-12 (2-4').
- Dibenzo(a,h)anthracene exceeded its standard at MW-8 (2-4') and MW-12 (2-4').

5.4.4 Pesticides and PCBs in Subsurface Soils

Five pesticides were detected above the instrument detection limit at three boring locations. These pesticides include methoxychlor at soil boring MW-8 (2-4'), delta-BHC at soil boring MW-9 (2-4') and alpha chlordane, 4-4'-DDD, and 4-4'-DDE at soil boring MW-10 (4-6'). These pesticides were detected at relatively low concentrations, all of which were below their NYSDEC TAGM 4046 RSCO values, if one exists.

Only one PCBs (Aroclor 1242) was detected at one location above the method and instrument detection limits in the subsurface soil samples analyzed. Aroclor 1242 was detected at soil boring MW-8 (2-4') at a concentration of 0.04 mg/kg, which is below its NYSDEC TAGM 4046 RSCO value of 1 mg/kg.

5.4.5 Metals in Subsurface Soils

With the exception of cyanide, the majority of the metals included in the TAL methodology were detected in the soil samples above the method and/or instrument detection limits. Metals are naturally occurring in the environment and soils, but several were also used by the tanning industry. The ensuing paragraphs discuss each detected metal with respect to guidance values and typical background levels reported in Eastern USA or New York State soils.

Aluminum was detected within each of the ten subsurface soil samples above the method detection limit and in a range of 2,200 mg/kg to 8,060 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for aluminum and 33,000 mg/kg is the NYSDEC TAGM 4046 Eastern USA background value. As such, the concentrations of aluminum are below its typical background concentration in Eastern USA soils. It is therefore inferred that aluminum concentrations at the site are within normal site background levels.

Antimony was detected within five of the ten subsurface soil samples above the method detection limit and in a range of 0.25 mg/kg to 41.9 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for antimony and there is no numeric NYSDEC TAGM 4046 Eastern USA background value for this metal. With no background value to compare to it is assumed that antimony is at normal site background as the detected concentrations are similar.

Arsenic was detected within each of the ten subsurface soil samples at varying concentrations above the method/instrument detection limit. Arsenic was detected between a range of 1.2 mg/kg to 700 mg/kg, five of which were at concentration above its NYSDEC TAGM 4046 RSCO value of 7.5 mg/kg or site background. Considering the typical background concentration of arsenic in New York State soils at 3 to 12 mg/kg, arsenic appears to be elevated at MW-8, MW-11, MW-12, and MW-13. Arsenic based compounds were commonly used in the tannery industry and past use of this metal within the buildings could have caused elevated levels to exist in the subsurface soil at these referenced locations.

Barium was detected within each of the ten subsurface soil samples above the method/instrument detection limit and within the range of 6.3 mg/kg to 1,390 mg/kg. Barium concentrations were below their NYSDEC TAGM 4046 RSCO of 300 mg/kg or site background and below the typical background range for Eastern USA soils except for one location. Barium appeared to be abnormally elevated at 1,390 mg/kg within the 2-4' soil sample collected from MW-11.

Beryllium was detected within each of the ten subsurface soil samples, above the instrument detection limit and within a range of 0.24 mg/kg to 0.68 mg/kg. The concentrations at all locations were above its NYSDEC TAGM 4046 RSCO value of 0.16 mg/kg or site background for this metal, but within the typical background range in Eastern USA soils of 0 mg/kg to 1.75 mg/kg. Since there is no known use of beryllium historically at the site, beryllium is considered to be within normal background levels at the site even though the concentrations exceed its NYSDEC TAGM background value.

Cadmium was detected within three of the ten subsurface soil samples above the instrument detection limit at MW-8 (2-4'), MW-10 (4-6') and MW-11 (2-4'). The concentrations of cadmium at these locations were 0.21 mg/kg, 6.1 mg/kg and 23.4 mg/kg, respectively. With a NYSDEC TAGM 4046 RSCO value of 10 mg/kg for this

metal and the typical background range in Eastern USA soils of 0.1 mg/kg to 1 mg/kg, one location exceeds its NYSDEC TAGM value (MW-11, 2-4') and two locations (MW-10, 4-6' and MW-11, 2-4') are higher than the background concentration range.

Calcium was detected within each of the ten subsurface soil samples, above the method detection limit within a range of 1,270 mg/kg to 40,300 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for calcium and there is no numeric NYSDEC TAGM 4046 Eastern USA background value for this metal. With no background value to compare to it is assumed that calcium is at normal site background as the detected concentrations are similar.

Chromium was detected within six of the ten subsurface soil samples, above the method detection limit. Of those locations where detected, chromium concentrations were above the NYSDEC RSCO value at MW-5 (2'-4'), MW-8 (2-4'), MW-10 (4-6') and MW-11 (2-4') at 91.1 mg/kg, 308 mg/kg, 9,870 mg/kg and 1,470 mg/kg, respectively. In addition, the concentrations of chromium at these locations are higher than the typical background range in Eastern USA soils.

Cobalt was detected within each of the ten subsurface soil samples, above the method detection limit within a range of 1.7 mg/kg to 11.7 mg/kg. The cobalt concentrations were below its NYSDEC RSCO value of 30 mg/kg and within the typical background range for this metal in New York State soils.

Copper was detected within each of the ten subsurface soil samples, above the method detection limit within a range of 1.6 mg/kg to 459 mg/kg. Of those locations where detected, cobalt concentrations were above its NYSDEC RSCO value at MW-8 (2-4'), MW-10 (4-6') and MW-11 (2-4') at 27.6 mg/kg, 63.6 mg/kg, and 459 mg/kg, respectively. With the typical background range of 1 mg/kg to 50 mg/kg for this metal in Eastern USA soils, the copper concentrations at MW-10 and MW-11 were also above this normal background level.

Iron was detected at each of the ten subsurface soil samples, above the method detection limit at concentrations ranging between 5,610 mg/kg and 107,000 mg/kg. Although this range of concentrations is greater than the numeric NYSDEC TAGM 4046 RSCO value for iron, the concentrations are within the typical background levels for

iron in Eastern USA soils. Iron oxide may have been used as a leather dying agent (red).

Lead was detected at each of the ten subsurface soil samples, above the method detection limit at concentrations between 1.8 mg/kg to 6,900 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for lead, this detected range is within and below the background range established by that guidance document (200 to 500 mg/kg) except for at one location. Lead was detected at a concentration of 6,900 at MW-11 (2-4').

Magnesium was detected at each of the ten subsurface soil samples, above the method detection limit at concentrations between 714 mg/kg to 5,760 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for magnesium, this range of concentrations is within the typical background range for Eastern USA soils except for at one location. Magnesium was detected at a concentration of 5,750 mg/kg at MW-10 (4-6'), which is slightly above the high value of 5,000 mg/kg for the background range.

Manganese was detected at each of the ten subsurface soil samples, above the method detection limit at concentrations between 32.7 mg/kg to 556 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for manganese, this range of concentrations is within the typical background range for Eastern USA soils.

Mercury was detected above the method detection limit at four of the ten subsurface soil samples. Those mercury detections were at sample locations MW-8, MW-10, MW-11 and MW-12, all of which exceeded its NYSDEC TAGM 4046 RSCO value and the typical background range for this metal in Eastern USA soils. It is uncertain as to the site background levels, but the mercury concentrations may be normal background except for at MW-10 which appears abnormally high in comparison to the other locations. Mercury based compounds in the form of biocides and fungicides may have historically been used by the tannery.

Nickel was detected within each of the ten subsurface soil samples, within a range of 3.2 mg/kg to 80.1 mg/kg. The concentrations of nickel only exceeded its NYSDEC TAGM 4046 RSCO value at two locations, MW-8 and MW-11. At MW-8 nickel was detected at 19.2 mg/kg, which is slightly above its NYSDEC TAGM 4046 RSCO value but below the typical background range of this metal in Eastern USA soils. At MW-11 nickel was

detected at 71.6 mg/kg, above its NYSDEC TAGM 4046 RSCO value and above the typical background range of this metal in Eastern USA soils. Since there is no known historical source of nickel at the site, nickel levels at the site are still considered to be within normal background levels.

Potassium was detected within each of the ten subsurface soil samples, within a range of 203 mg/kg to 1,090 mg/kg. With no numeric NYSDEC TAGM 4046 RSCO value and the typical background concentration for New York State soils of 8,500 mg/kg to 43,000 mg/kg, the concentrations of potassium are below the typical background concentrations in New York State soils.

Selenium was detected within eight of the ten subsurface soil samples above the instrument detection limit within a range of 0.035 to 4.1 mg/kg. Of those locations where detected, only the selenium concentration (4.1 mg/kg) at MW-10 was above its NYSDEC TAGM 4046 RSCO value of 2 mg/kg, and above its typical background range of 0.1 mg/kg to 3.9 mg/kg.

Silver was detected above the method detection limit in nine of the ten subsurface soil samples, within a range of 0.028 mg/kg to 0.59 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for silver and there is no numeric NYSDEC TAGM 4046 Eastern USA background value for this metal. With no background value to compare to it is assumed that silver is at normal site background as the detected concentrations are similar.

Sodium was detected at each of the ten subsurface soil samples, above the method detection limit at concentrations within a range of 73.6 mg/kg to 3,440 mg/kg. Although there is no numeric NYSDEC TAGM 4046 RSCO value for sodium, this range is below the typical background range for Eastern USA soils.

Thallium was detected above the method detection limit in seven of the ten subsurface soil samples, within a range of 0.18 mg/kg to 1.5 mg/kg. There is no numeric value (i.e., site background) set forth in NYSDEC TAGM 4046 for thallium and there is no numeric NYSDEC TAGM 4046 Eastern USA background value for this metal. With no background value to compare to it is assumed that thallium is at normal site background as the detected concentrations are similar.

Vanadium was detected within each of the ten subsurface soil samples above the method detection limit within a range of 8.8 mg/kg to 39.7 mg/kg. With the NYSDEC TAGM 4046 RSCO value of 150 mg/kg or site background and the NYSDEC TAGM 4046 Eastern USA background levels being 9 mg/kg to 50 mg/kg, these concentrations of vanadium appear to be normal background levels.

Zinc was detected above the method detection limit within each of the ten subsurface soil samples within a range of 12.5 mg/kg to 1,630 mg/kg. Zinc concentrations exceeded its NYSDEC TAGM 4046 RSCO value at sample locations MW-5, MW-8, MW-10, MW-11, MW-12 and MW-13. Sample locations MW-8, MW-10 and MW-11 were the only locations that also exceeded the typical background range of 9 to 50 mg/kg for this metal in Eastern USA soils.

5.4.6 Cyanide in Subsurface Soils

Cyanide was not detected above the method and instrument detection limits in any of the ten subsurface soil samples analyzed.

5.5 Groundwater

5.5.1 General

Thirteen (13) groundwater monitoring wells were installed as part of the site wide subsurface/hydrogeologic investigation. Groundwater samples were collected and analyzed from each well for the TCL of VOCs and SVOCs, PCBs, Pesticides and Cyanide, and the TAL of metals. The analytical results are discussed in the following subsections.

Analytical summary tables were prepared for the VOCs, SVOCs, pesticides/PCBs and metals analyses for groundwater samples. These tables are numbered 5.5.2-1, 5.5.3-1, 5.5.4-1 and 5.5.5-1, respectively and are presented within this section of the report.

5.5.2 Volatile Organic Compounds in Groundwater

No VOCs were detected above the method/instrument detection limits within the groundwater samples except for those collected from monitoring wells MW-7, MW-10, MW-11, MW-13 and MW-15. At these locations nine VOCs were detected although not

all nine VOCs were detected at each location. At monitoring well MW-7 acetone, ethylbenzene and xylenes were detected above the method/instrument detection limit with total xylenes being the only compound detected at a concentration (9 ug/l) above its NYSDEC groundwater standard value of 5 ug/l. At monitoring well MW-10 benzene, chlorobenzene, 1,2-dichloroethene (cis), ethylbenzene, toluene and xylenes were detected above the method/instrument detection limit with ethylbenzene and total xylenes being the only compounds detected at concentrations (10 ug/l and 75 ug/l, respectively) above their NYSDEC groundwater standard values of 5 ug/l. At monitoring well MW-11 vinyl chloride was the only compound detected at 0.8 ug/l, which is below its NYSDEC groundwater standard value of 2 ug/l. At monitoring well MW-13 acetone, benzene, carbon disulfide, ethylbenzene and xylenes were detected above the method/instrument detection limit with ethylbenzene and total xylenes being the only compounds detected at concentrations (10 ug/l and 10 ug/l, respectively) above their NYSDEC groundwater standard values of 5 ug/l. At monitoring well MW-15 ethylbenzene and xylenes were the only compounds detected above the method detection limit at concentrations of 8 and 48 ug/l, respectively, both of which also exceeded its NYSDEC groundwater standard values of 5 ug/l.

5.5.3 Semi-volatile Organic Compounds in Groundwater

Fifteen SVOCs, consisting of acenaphthalene, acenaphthylene, carbazole, 2,4-dichlorophenol, fluoranthene, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol, naphthalene, pentachlorophenol, phenanthrene, pyrene, 2,4,5-trichlophenol, 2,4,6-trichlorophenol, were detected in groundwater samples. Of those detected, naphthalene, pentachlorophenol and phenol were the only SVOCs that were detected at concentrations that exceeded their NYSDEC groundwater standard or guidance values, as follows:

- Naphthalene and pentachlorophenol were detected within groundwater at MW-7 at concentrations of 15 ug/l and 3 ug/l, respectively. These concentrations exceeded the NYSDEC groundwater guidance value of 10 ug/l for naphthalene, and its NYSDEC standard value of 1 ug/l for pentachlorophenol.

- Naphthalene was detected at a concentration of 11 ug/l within groundwater at monitoring well MW-12. This concentration exceeded the NYSDEC groundwater guidance value of 10 ug/l.

- Naphthalene and phenol were detected within groundwater at MW-13 at concentrations of 130 ug/l and 22 ug/l, respectively. These concentrations exceeded the NYSDEC guidance value of 10 ug/l for naphthalene, and the NYSDEC groundwater standard value of 1 ug/l for phenol.

- Naphthalene was detected at a concentration of 12 ug/l at monitoring well MW-15, above its NYSDEC groundwater guidance value of 10 ug/l.

5.5.4 Pesticides and PCBs in Groundwater

Two pesticides, 4,4'-DDD and endrin keytone, were detected above the instrument detection limits. No other pesticides were detected above the method/instrument detection limits. 4,4'-DDD was detected in groundwater at monitoring well MW-7 at a concentration of 0.071 ug/l, which is below its NYSDEC groundwater standard value of 0.2 ug/l. Endrin keytone was detected in groundwater at monitoring well MW-10 at a concentration of 0.069 ug/l. There is no NYSDEC groundwater standard or guidance value for this pesticide.

No PCBs were detected above the method and instrument detection limits in any of the samples analyzed.

5.5.5 Metals in Groundwater

With the exception of beryllium, cadmium, mercury, selenium, silver and thallium, the majority of the metals included in the methodology were detected in the groundwater samples above the method and/or instrument detection limits. Eighteen analytes were detected above NYSDEC groundwater standards in one or more monitoring well location. The ensuing paragraphs discuss each metal with respect to its water quality standard value and the well locations where the exceedances were detected.

Antimony was detected above its NYSDEC groundwater standard at one location, MW-8, which is beneath the main tannery building (south end near the WWTP). Antimony was not detected above the method detection limit at any other well location. Since antimony was not detected at any other locations it is assumed that the antimony concentration at MW-8 may be an isolated occurrence. There is no known historical use of antimony identified at the site, but other metals were also detected at this location.

Arsenic was detected above its NYSDEC groundwater standard at seven of the thirteen well locations, one on the west side of the creek and six on the east side of the creek. The highest concentration of arsenic observed on the site was detected beneath the main tannery building (south end near the WWTP) at monitoring well MW-8. Arsenic was detected at a concentration of 4,780 ug/l at MW-8, which is above its NYSDEC groundwater standard value of 25 ug/l. The remaining arsenic exceedances were detected in all of the wells on the east side of the creek, except for one location, MW-14, the upgradient well location. Concentrations of arsenic, for those that exceeded its NYSDEC groundwater standard value, ranged from 100 to 494 ug/l. Arsenic was not detected above the method/instrument detection limit at MW-14, the upgradient monitoring well. Arsenic related compounds were historically used by the tannery industry. To verify the concentration of arsenic at monitoring well MW-8, this well was purged and sampled in September 2003. The analytical results were not subjected to data validation, but the results were similar on the order of 4,970 ug/l.

Chromium was detected above its NYSDEC groundwater standard at one location (MW-10). Chromium was detected at a concentration of 148 ug/l, which is above its NYSDEC groundwater standard value of 50 ug/l. All of the other chromium detections at the site were below 16 ug/l. Chromium related compounds were historically used by the tannery industry, however, monitoring well MW-10 is located in the extreme southern portion of the site where no tannery related activities were reportedly performed. To verify the concentration of arsenic at monitoring well MW-10, this well was purged and sampled in September 2003. The analytical results were not subjected to data validation, but the results were slightly less on the order of 87.6 ug/l.

Iron was detected above its NYSDEC groundwater standard at all well locations within a range of 332 to 33,900 ug/l. The highest concentrations of iron observed in the site were beneath the buildings or immediately downgradient of the buildings. Iron oxide may have been used as a leather dying agent (red).

Magnesium was detected above its NYSDEC groundwater standard at two locations (MW-7 and MW-10). Considering the comparatively lower concentrations at the other nearby well locations, there is no pattern or grouping of elevated magnesium results.

Manganese was detected above its NYSDEC groundwater standard at six locations (MW-5, MW-7, MW-10, MW-11, MW-12 and MW-15). The concentrations of

manganese at these locations were relatively similar (327 to 504 ug/l) and only slightly above its NYSDEC groundwater standard value, except for at monitoring well MW-7. The manganese concentration at monitoring well MW-7 was 7,420 ug/l. Considering there is no known historical use of manganese identified at the site, the elevated manganese concentration MW-7 may be an isolated occurrence.

Sodium was detected above its NYSDEC groundwater standard at most well locations except for MW-11, MW-14 and B-2. Monitoring well locations MW-14 and possibly MW-11 are inferred to be up-gradient of the eastern side of the tannery complex. The sodium concentrations were abnormally high in general, but were particularly high at locations beneath the buildings (MW-7, MW-8, MW-13 and MW-15). Sodium chloride and other sodium based compounds were used in abundance in the tannery industry.

5.5.6 Cyanide in Groundwater

Cyanide was not detected above the method and instrument detection limits in groundwater samples except at monitoring well MW-10. The concentration of cyanide at this location is 195 ug/l. The concentration of cyanide is below the NYSDEC groundwater standard of 200 ug/l.

5.6 Utility Conduits

The geophysical investigation of the site did not identify underground drainage structures. Section 3.4 of this report describes the results of the geophysical investigation. The location of buried piping runs could serve as preferred migration routes for contaminates. There were several pipes observed protruding from the existing creek embankment rock walls at various depths and locations. The origins of these pipes are unknown and their purposes are also in question. The majority of the pipes appear to be inactive as no active water drainage was observed. If soil or groundwater contamination existed in the area of these pipe runs, it would likely migrate along the pathway of the drainage piping and outfall into the creek. Surface water and sediment samples collected and analyzed from the creek did not suggest significant environmental impacts to these media.

As part of EPA's Emergency Response Action, a continuously flowing water spring in the western portion of the site within the north side of the main tannery building was

found. The spring was located in close proximity to monitoring well MW-5. To permanently address the spring EPA installed a french drain system to divert the flow of water into the creek. The analytical results for the groundwater sample from monitoring well MW-5 did not detect any VOCs, SVOCs, pesticides or PCBs above the method or instrument detection limits. Several metals were detected, three of which (iron, manganese, and sodium) were above their NYSDEC groundwater standard values.

According to the utility mark out required prior to any subsurface digging activities and information provided by City of Gloversville Department of Public Works, municipal water, natural gas and sanitary sewer utilities are reportedly present on the subject site. The municipal water supply for the site entered the main tannery building from South Main Street. Since the water line piping is relatively short, it is not likely that this utility would act as a conduit for contamination to migrate.

There are two sanitary sewer truck lines that traverse the site. One line follows the west side of the creek and the other follows the bike path along the eastern property line. Both sewer lines generally run on a north-south direction. Sewer manhole covers are located in the southwest portion of the site and just north of the site's northeast property corner. The sewer line along the bike path is off-site and considered upgradient of the site based on the inferred groundwater flow direction. Based on groundwater analytical data from MW-14, which is located in the northeast portion of the site close to the sewer line, groundwater does not appear to be contaminated in this area of the site. The only parameter detected above SCGs was iron, and only slightly above its SCG. Therefore, it is not likely that contamination is migrating along this sewer pipe run. The second sewer line along the west side of the creek traverses the site in the area of monitoring well MW-6 and MW-8. The groundwater analytical results for monitoring well MW-6 did not reveal any parameters above SCGs except for iron and sodium. The groundwater analytical results for monitoring well MW-8 did not reveal any parameters above SCGs except for antimony, arsenic, iron and sodium. The highest concentration of arsenic was detected at MW-8 and this contamination could likely migrate along the pathway of the sewer line as monitoring well MW-8 is located close to this sewer line.

A natural gas line is reportedly located south of the secondary tannery building running in an east-west direction. There were elevated compounds/analytes detected

in this area of the site. Typically, natural gas lines are buried 2 to 4 feet below grade which in the case is above the water table. Therefore, the potential for contaminant migration along this piping route is remote.

5.7 Summary Of Extent of Contamination

5.7.1 Surface Water

Analyses of the surface water from three sampling locations within the on-site creek indicate that no VOCs, SVOCs, pesticides, PCBs, cyanide or metals (except for aluminum and iron) were detected above NYSDEC surface water standard values. Aluminum was detected within the upstream sampling location below the method detection limit, but below the instrument detection limit at 202 ug/l as presented in the following summary table. The two downstream locations did not detect aluminum above the method or instrument detection limits. Iron was detected in each of the three surface water samples at similar concentrations, however, the highest concentration was within the upstream sample location as presented in the following summary table. The upstream surface water sample was collected from the creek at a point where it enters the site (north side). Considering this information, it is inferred that aluminum and iron concentrations in the creek surface water are not elevated as a result of current or past activities within the site.

Surface Water Metals Detections,
Locations & Concentrations Above Guidance Values

Parameter	Detected Concentration (ug/L) and Location	NYSDEC Surface Water Quality Standard Value (ug/L)
Aluminum	202 at SW-1 (Upstream)	100
	<500 at SW-2 (Center of the site)	
	<500 at SW-3 (Downstream)	
Iron	393 at SW-1 (Upstream)	300
	195 at SW-2 (Center of the site)	
	221 at SW-3 (Downstream)	

5.7.2 Creek Sediments

Analyses of the creek sediment samples collected from three locations indicate that no VOCs, SVOCs (except for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenzo(a,h)anthracene), pesticides, PCBs, cyanide or metals (except for copper, iron, and zinc) were detected above NYSDEC TAGM 4046 recommended cleanup objective values. The detection of SVOCs appeared to be more prevalent in the upstream sample as compared to the downstream samples. Additionally, the concentrations of the SVOCs in the upstream sample were above their NYSDEC Technical Guidance for Screening Sediment SCGs. As the highest concentrations of SVOCs were observed in the upstream sample and noticeably lower in the other downstream samples, it is inferred that the SVOCs are not elevated as a result of current or past historical activities within the site.

Copper was detected at similar concentrations in the upstream sample and the most downstream sample, although the upstream was slightly higher. Copper within the creek at the center of the site was at its lowest concentration. Copper slightly exceeds its SCG and all concentrations are within normal background levels found in Eastern USA soils. As such, copper does not appear to be elevated as a result of current or past activities at the site. Refer to the following table for a summary of the copper detections, locations and concentrations.

Iron was detected in each of the creek sediment samples above its SCG with the highest concentration being within the center of the site. The upstream and downstream samples exhibited similar analytical results. Although iron concentrations are within the normal background levels found in Eastern USA soils, iron levels at the site may be elevated as a result of past site tanning activities. Refer to the following table for a summary of the iron detections, locations and concentrations.

Zinc was detected in each of the creek sediment samples above its SCG with the highest concentration being within the upstream sample. The downstream samples were similar to each other, but lower than the upstream sample. In addition, the concentration of zinc within the downstream samples are very close to the normal background range for this metal in Eastern USA soils. Considering the upstream location is the highest concentration and the downstream concentrations of zinc are lower in magnitude (by half), it is inferred that the zinc levels at the site are not elevated

as a result of current or past activities on-site. Refer to the following table for a summary of the zinc detections, locations and concentrations.

Sediment Metals Detections,
Locations & Concentrations Above Guidance Values

Parameter	Detected Concentration (mg/kg) and Location	NYSDEC TAGM Values (mg/kg)	NYSDEC Technical Guidance for Screening Sediments (ug/g)	USEPA Eastern USA Background (mg/kg)
Copper	33.8 at CS-1 (Upstream)	25 or Site Background	16 Lower Effect (LE) 110 Severe Effect (SE)	1 to 50
	7.9 at CS-2 (Center of Site)			
	25.8 at CS-3 (Downstream)			
Iron	8,780 at CS-1 (Upstream)	2,000 or Site Background	2% or 20,000 LE 4% or 40,000 SE	2,000 to 550,000
	11,800 at CS-2 (Center of Site)			
	8,770 at CS-3 (Downstream)			
Zinc	99.5 at CS-1 (Upstream)	20 or Site Background	120 LE 270 SE	9 to 50
	47.5 at CS-2 (Center of Site)			
	55.3 at CS-3 (Downstream)			

5.7.3 Surface Soils

Analysis of the surface soil samples collected from across the site indicate that no VOCs (except for ethylbenzene and xylenes at one location), SVOCs (except for eight detected in a minority of samples), pesticides, PCBs detected above NYSDEC TAGM 4046 recommended cleanup objective values. There were several metals detected above NYSDEC TAGM 4046 recommended cleanup values.

Ethylbenzene and xylenes were detected within the surface soil sample collected from SS-6, which is located beneath the secondary tannery building. Ethylbenzene was detected at a concentration 40 mg/kg and total xylenes were detected at a concentration of 33 mg/kg, which are above their SCGs of 5.5 and 1.2 mg/kg, respectively. EPA, as part of the Emergency Response Action, conducted petroleum vapor screening at a number of locations beneath the secondary tannery building. EPA reported that elevated VOC readings were detected at multiple locations and the analytical results of a surface soil sample from SS-5 (EPA SSE-5) identified eleven VOCs. None of the VOCs detected exceeded their respective SCG. The horizontal and vertical extent of VOC contaminants was not fully defined beneath the secondary tannery building by C.T. Male or EPA.

There were a few SVOCs detected above their SCGs, the majority of which were detected at surface soil sample locations SS-6, and to a lesser degree at SS-8, both of which were beneath site buildings. Similar SVOCs were also detected at concentrations consistent with those at SS-6 at sample locations EPA SSE-4, SS-1 (EPA SSW-9) and SS-2 (EPA SSW-19), which are located in the western portion of the site.

The majority of metals detected are naturally occurring in the environment. The concentrations of a number of the metals detected in the soil samples as compared to their concentrations across the site, their typical Eastern USA background levels, and their apparent non-use in the tanning process, suggest they are not site contaminants. There does, however, appear to be elevated concentrations of arsenic (SS-1 or EPA SSW-9, SS-3 or EPA SSW-31, SS-6 and SS-8) and chromium (SS-1 or EPA SSW-9, SS-2 or EPA SSW-19, SS-3 or EPA SSW-31, SS-6, SS-7 and SS-8) which are considered contaminants of concern. These locations are sporadic across the site and do not appear concentrated to any one location within the site. The concentrations of arsenic and chromium at surface soil sample location SS-6 are considerably higher than at the other locations of detection. Additionally, the analytical results from EPA indicate that the chromium concentration at SS-3 (EPA SSW-31) was the highest concentration within the surface soil samples.

In addition to arsenic and chromium, mercury and zinc concentrations appear to exist at concentrations above site background and background levels found in Eastern USA soils, and therefore are suspect contaminants of concern. These occurances exist for mercury at SS-1 or EPA SSW-9, SS-2 or EPA SSW-19, SS-3 or EPA SSW-31, and SS-8, and for zinc at SS-1 or EPA SSW-9, SS-2 or EPA SSW-19, SS-3 or EPA SSW-31, SS-6, SS-7 and SS-8. These locations are sporadic across the site and do not reflect a localized presence. However, the concentrations of mercury and zinc at surface soil sample location SS-6 are considerably higher than at the other sampling locations.

5.7.3 Subsurface Soil

Of the ten subsurface soil samples analyzed for this project, one VOC, six SVOCs and eleven metals were detected above SCGs. No pesticides, PCBs or cyanide were detected above SCGs. Acetone, a VOC, was detected above SCGs at three of the ten locations (MW-10, MW-11, and MW-13). The acetone concentrations were relatively low and acetone is a common laboratory artifact. It is unclear whether acetone is a result of the

laboratory, but with no confirmed acetone use within the tannery industrial, acetone is not considered to be a site contaminant. Six SVOCs were detected at three of the ten boring locations (MW-8, MW-10 and MW-12). The concentrations were similar at MW-8 and MW-10 and were noticeably higher at MW-12. The subsurface soil sample from MW-12 is immediately downgradient of the secondary tannery building where these compounds were also detected within the surface soil sample from SS-6 beneath the building. This suggests that the source of the SVOCs may be beneath the secondary tannery building, although a specific source has not been identified.

The metals detected above SCGs in the subsurface soils were: arsenic at five locations, barium at one location, beryllium at ten locations, cadmium at one location, chromium at four locations, copper at three locations, iron at ten locations, mercury at four locations, nickel at two locations, selenium at one location, and zinc at six locations. The concentrations of the metals detected in the soil samples as compared to their concentrations across the site and the typical Eastern USA or New York State background levels suggest that barium, beryllium, copper, iron, zinc are not site contaminants. Cadmium, copper, mercury, nickel and selenium were detected at concentrations exceeding normal background concentrations in one or more location. Comparison of these results to the groundwater analytical data for those locations suggest they are not contaminants of concern as they were either not detected or present at concentrations significantly below their groundwater SCGs. There does, however, appear to be elevated concentrations of arsenic and chromium in the subsurface soils, as described in the following paragraphs.

Elevated arsenic concentrations were observed at MW-11, MW-12 and MW-13 (east side of the creek), and to a lesser degree at MW-8 and MW-10 (west side of the creek). Monitoring well MW-13 is located within the secondary tannery building and monitoring well MW-12 is located immediately down gradient and outside the secondary tannery building. Monitoring well MW-11 is considered cross-gradient with respect to MW-12 and MW-13 based on the inferred groundwater flow direction. The elevated arsenic concentrations in subsurface soils on the west side of the creek do not indicate there is a source location of arsenic.

Elevated chromium concentrations were observed at MW-10 and MW-11, and to a lesser degree at MW-5 and MW-8. These locations are not concentrated to any one

location of feature within the site. The analytical data, does not suggests that there is a source area of chromium contamination within the site.

5.7.4 Groundwater

Eleven new monitoring wells were installed across the site and sampled to evaluate the quality of the site's groundwater. Two pre-existing monitoring wells were also sampled to provide additional groundwater quality data. The analytical results identified three VOCs, three SVOCs and seven metals above SCGs. No pesticides, PCBs or cyanide were detected above SCGs.

The VOCs detected were benzene, ethylbenzene and xylenes. Benzene was detected at MW-10 and MW-13, ethylbenzene and xylenes were detected at MW-10, MW-13 and MW-15. Monitoring wells MW-13 and MW-15 are both located within the footprint of the secondary tannery building, and MW-10 on the western side of the creek in the southern portion of the site.

The SVOCs detected were naphthalene, pentachlorophenol and phenol. Naphthalene was detected at monitoring wells MW-7, MW-12, MW-13 and MW-15, three of which are within and immediately downgradient of the secondary tannery building. These detections may represent a contaminant plume of naphthalene emanating from the secondary tannery building. The fourth location (MW-7), where naphthalene was detected at a relatively low concentration and the surrounding wells did not detect naphthalene, is considered an isolated occurrence. Pentachlorophenol was also detected at monitoring well MW-7 and is considered to be an isolated occurrence, as it was not detected at any other location. Phenol was detected at one location (MW-13) and is an isolated occurrence as well.

Seven metals were detected in groundwater above SCGs at one or more well locations. The concentrations of antimony and manganese detected in the groundwater as compared to their concentrations across the site, their concentrations at inferred up-gradient well locations (MW-9 and MW-14), and their apparent absence in the tanning process suggest they are not contaminates of concern. The metals considered site contaminants or suspect site contaminants are arsenic, chromium, iron, magnesium and sodium. The metals detected in groundwater above SCGs were arsenic at seven

locations, chromium at one location, iron at thirteen locations, magnesium at two locations and sodium at ten locations.

The concentrations of arsenic appeared to be elevated in one location on the west side of the creek and at most monitoring well locations on the east side of the creek. The concentrations suggest that a contaminant plume of arsenic may exist within the footprint and downgradient of the secondary tannery building. The concentrations of chromium were only elevated at one location (MW-10) and does not suggest that a significant chromium plume exists at this location. The concentrations of iron were elevated across the site and noticeably higher beneath the main and secondary tannery buildings and immediately downgradient of the secondary tannery building. The concentrations of magnesium were randomly elevated and do not suggest the presence of a source of area contamination. The concentrations of sodium were abnormally high across the site particularly beneath the main and secondary tannery buildings. Sodium chloride and sodium bicarbonate were commonly used in the tanning process, particularly as a hide preservative and as a pH buffer agent.

5.8 Tanning Activities Relative to Site Contaminants

Independent Leather as it is named today, is one of the many defunct older commercial tanneries within the City of Gloversville. As is the case for most industries, the tanning process has changed methods, processes and use of chemicals throughout the years to increase production and quality, and reduce costs. As Independent Leather is one of the older tanneries it has likely conducted a wide array of tanning processes, and the chemical data developed through this investigation supports this observation. The tanning processes are for the most part "wet work" meaning that nearly all of the hide treatments used to prepare finished leather were completed with various water based compounds and copious amounts of water for flushing and rinsing. Public records for the Independent Leather indicate that in the 1980's the projected average weekday daily discharge of wastewater to the municipal system was on the order of 100,000 gallons per day. Prior to the connection to the municipal sanitary sewer, liquid discharges were likely directed to the adjacent creek.

According to historical information, one of the older chemical methods for de-hairing skins originally involved the use of arsenic sulfide, which in a paste form was painted onto the skins. Based on the site data, arsenic has been documented to exist within the

surficial soils, subsurface soils and groundwater at concentrations above typical background concentrations and in excess of regulatory guidance and standard values for these various media. The occurrence of arsenic is most prevalent within the eastern sections of the site, primarily beneath the secondary tannery building, but also present outside the footprint of that building.

Chromium is a very common element used in the tanning process and is expected to be most prevalent within the site. From the investigation completed, chromium was concentrated in the area of SS-3 (EPA SSW-31), and to a lesser degree at SS-6, SS-7 and SS-8, the latter being beneath the main and secondary tannery buildings. Chromium concentrations within surface soil based on EPA provided data indicates that chromium is elevated on the east side of the site, south of the secondary tannery building and surrounding the former storage building. Within the subsurface soil, chromium was most prevalent in the southern portions of the site in the area of monitoring wells MW-10 and MW-11 (undeveloped areas of the site), and to a lesser degree at monitoring wells MW-8 and MW-5, which are located within the footprint of the main tannery building. Within groundwater, chromium was found in excess of regulatory standards only at one location, MW-10, which is located in the southern area of the site where no tanning activities were reportedly conducted.

Historically, mercury has been a component in the production of biocides, insecticides, and fungicides. These products may have been used at the tannery into the 1900's to preserve the raw skins prior to being tanned. Mercury was detected above both recommended soil cleanup values and natural background levels in the surface soils predominantly beneath the secondary tannery building and to a lesser extent in the area of the WWTP, both outside and beneath the main tannery building. Mercury in subsurface soils was sporadically detected above both recommended soil cleanup values and natural background levels at MW-8, MW-10 and MW-11. Mercury was found at its highest concentration within the southern portion of the site at MW-10 (subsurface soils), and to a lesser degree at SS-6 (surface soils).

Copper and copper related compounds have been historically used in the tannery industry as a coloring agent (green), however, its use specifically at Independent Leather is not known. Within the surface and subsurface soils, copper was found to be elevated above background levels primarily in the southern portion of the site (MW-10 and MW-11) and to a lesser degree beneath the main tannery building in the area of the

WWTP. Concentrations of copper in groundwater, where detected, were not found above its NYSDEC groundwater standard value.

Iron in the form of iron oxides may have been used at the tannery as a dying agent (red). Iron is also a common element often found in excess of its regulatory values for both water and soil. Iron was detected above its surface water standard only in the upstream surface water sample. Iron was detected above standard values within all of the sediment, surface soil and subsurface soil, but not at concentrations which exceed normal background concentrations in Eastern USA soils. Iron concentrations also exceeded NYSDEC water quality standard values at all locations. Iron, being a comment element in the environment, is not considered to be a contaminant of concern.

Magnesium in the form of magnesium oxide is believed to been used at the tannery to neutralize various acid baths. Magnesium oxide was apparently used to raise the pH as in the acid baths as its application did not need to be as precise or controlled as was the case for other alkalines. Magnesium was detected in a number of surface and subsurface samples with only a limited number having concentrations above Eastern USA soil background levels. Within groundwater, magnesium only exceeded groundwater standards at two of the thirteen monitoring well locations, one beneath the main tannery building and the other within the southern portion of the site. With only a few exceedances of magnesium, this metal is not considered to be a contaminant of concern.

Zinc based compounds may have been used within the tannery as a white leather pigment. Zinc was detected in nearly all of the sediment, surface and most of the subsurface soil samples above SCGs. Zinc was not detected above regulatory values in any of the groundwater samples. Zinc is not considered to be a contaminant of concern based on the absence of this metal in groundwater.

A limited number of volatile and semi-volatile organic compounds were detected within various areas of the site above regulatory limits for surface and subsurface soil, and groundwater. The majority of these compounds were semi-volatile organic compounds. The source of SVOCs is unknown and could be related to coal and wood ash from the original tannery heating system. Historical maps of the site identify coal storage areas within the site. Benzene, ethylbenzene, xylenes, and naphthalene may be

related to the de-fatting agents used on various skins as it was detected in soils beneath the tannery buildings.

5.9 Fish and Wildlife Impact Analysis (FWIA) Results

Steps I and II of a New York State Department of Environmental Conservation (NYSDEC) Fish and Wildlife Impact Assessment (FWIA) (NYSDEC, 1994) were completed by C.T. Male.

The overall objective of the FWIA is to assess the effect that contaminants from the subject site may pose on fish and wildlife resources. The specific objectives of Step I are to identify the fish and wildlife resources, land-use and habitat types that exist in the vicinity of the subject site, and to provide information necessary for the design of the SI. In addition, fish and wildlife species that may utilize habitats that could potentially be impacted by site-related contaminants are identified. This information is necessary to allow identification of potential pathways of contaminant migration into and through fish and wildlife resources

Step I consisted of a site description, a description of fish and wildlife resources and a description of fish and wildlife resource values, this information indicated that potential wildlife resources exist on the site. Step II consisted of a pathway analysis describing the potential exposure of Contaminants of Potential Concern (COPCs) to fish and wildlife resources.

The former Independent Leather site consists of approximately 3.7 acres of open urban vacant land with sparse vegetation. The non-urban covertypes on the site are heavily influenced by urbanization. Industrial, commercial and residential areas have eliminated much of the natural habitat in the area and have replaced it with urban wildlife habitats consisting primarily of mowed lawns with trees, paved roads, parking lots, land fills and urban structure exteriors.

The wildlife potentially inhabiting the terrestrial covertypes and the habitat value of each covertype in the vicinity of the study area were qualitatively evaluated based on field observations of physical characteristics. The habitat quality of terrestrial covertypes, resident wildlife species requirements for food sources, home range, breeding requirements and cover were examined and compared to covertype characteristics.

In general, the value of wildlife inhabiting the study area to humans is very limited. Access to the Independent Leather site is restricted by signage, fencing and other features, and there is no hunting allowed within the City of Gloversville. For these reasons the value of wildlife in the study area for humans is considered to be low.

The objective of the Step II pathway analysis was to identify the specific constituents in the environmental media that are present and, therefore, may require further evaluation. The identification of COPCs for the site was based on comparisons of maximum constituent media concentrations to ecologically based screening criteria and background levels. If the maximum media constituent concentration exceeded the screening value as well as background concentrations, the constituent was identified as a COPC for that medium.

Groundwater: There are no pathways for wildlife contamination associated with groundwater.

Creek Surface Water: There are no pathways for wildlife contamination associated with surface water.

Creek Sediment: Under current conditions, the potential exposure for fish and wildlife to sediments is expected to be minimal based primarily on the low detection limits of the site, and the submerged nature of the sediments.

Surface Soils: The lack of any significant wildlife habitat resource at the site indicates that surface soil contaminants are not a significant exposure pathway under present use conditions.

Subsurface Soils: Subsurface soil is not considered a significant exposure pathway under present use conditions.

In conclusion, this fish and wildlife impact assessment demonstrates that under present condition there is no more than a minimal impact to fish and wildlife resources. There are no pathways for wildlife contamination associated with either groundwater or surface water. For sediments and surface soil, based on the lack of any significant fish or wildlife resources at the subject site, no more than minimal impacts to either fish or wildlife have been identified. For subsurface soil, there are no pathways for wildlife contamination. The full FWIA with attachments is presented as Exhibit 3.

6.0 CONTAMINANT FATE AND TRANSPORT

6.1 General Overview

The site related contaminants include volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) most likely associated with petroleum based fuels or solvents, and metals. Specifically, the compounds and analytes detected within the site subsurface and surface soil, sediments, surface water and/or groundwater are presented in the following table. The chemical compounds detected in media below regulatory levels are not included in the table.

TABLE 1.5.1-1 SUMMARY OF CONTAMINANTS OF CONCERN FOR EACH MEDIA						
Media	Class	Contaminant of Concern	Detected Concentration Range	Frequency of Exceeding Standard	Applicable SCG (1)	Eastern USA Background (2) Or Sediment Criteria (3)
Surface Soil (mg/kg or ppm)	VOCs	Ethylbenzene	0.037 and40	1 of 2	5.5	NA (2)
		Total Xylenes	0.44 and 33	1 of 2	1.2	NA (2)
	SVOCs	Benzo(a)anthracene	2	1 of 1	0.224 or MDL	NA (2)
		Benzo(a)anthracene by EPA (4)	3.5	1 of 1	0.224 or MDL	NA (2)
		Benzo(a)pyrene	1.6	1 of 1	0.061 or MDL	NA (2)
		Benzo(a)pyrene by EPA (4)	4.2	1 of 1	0.061 or MDL	NA (2)
		Benzo(b)fluoranthene by EPA (2)	5.2	1 of 1	0.224 or MDL	NA (2)
		Benzo(k)fluoranthene by EPA (2)	5.0	1 of 1	0.224 or MDL	NA (2)
		Chrysene	2	1 of 1	0.4	NA (2)
		Chrysene by EPA (4)	4.5	1 of 1	0.4	NA (2)
		2-Methylnaphthalene	37	1 of 1	36.4	NA (2)
		Naphthalene	110	1 of 1	13	NA (2)
	Pesticides	NONE	NA	NA	NA	NA
	PCBS	NONE	NA	NA	NA	NA
	Metals	Arsenic (As)	3,510	1 of 1	7.5 of SB	3 to 12 (2)
		Arsenic (As) by EPA (4)	2.1 and 42	1 of 2	7.5 of SB	3 to 12 (2)
		Chromium (Cr)	605	1 of 1	50	1.5 to 40 (2)
		Chromium (Cr) by EPA (4)	177 to 605	7 of 14	50	1.5 to 40 (2)
		Copper (Cu)	123	1 of 1	25 or SB	1 to 50 (2)
		Iron (Fe)	30,400	1 of 1	2,000 or SB	2,000 to 550,000 (2)
		Iron (Fe) by EPA (4)	7,000 and 10,000	2 of 2	2,000 or SB	2,000 to 550,000 (2)
		Mercury (Hg)	3.1	1 of 1	0.1	0.001 to 0.2 (2)
Surface Soil	Metals	Nickel (Ni)	34.8	1 of 1	13 or SB	0.5 to 25 (2)
		Zinc (Zn)	255	1 of 1	20 or SB	9 to 50 (2)
		Zinc (Zn) by EPA (4)	21 and 45	2 of 2	20 or SB	9 to 50 (2)
Stream Surface Water (ug/l or ppb)	VOCs	NONE	NA	NA	NA	NA
	SVOCs	NONE	NA	NA	NA	NA
	Pesticides	NONE	NA	NA	NA	NA
	PCBs	NONE	NA	NA	NA	NA
	Metals	Aluminum (Al)	ND to 202	1 of 3	100	NA
		Iron (Fe)	195 to 393	1 of 3	300	NA

TABLE 1.5.1-1 SUMMARY OF CONTAMINANTS OF CONCERN FOR EACH MEDIA						
Media	Class	Contaminant of Concern	Detected Concentration Range	Frequency of Exceeding Standard	Applicable SCG (1)	Eastern USA Background (2) Or Sediment Criteria (3)
Stream Sediment (mg/kg or ppm)	VOCs	NONE	NA	NA	NA	NA
	SVOCs	Benzo(a)anthracene	0.14 to 2.7	2 of 3	0.224 or MDL	1.3 (3)
		Benzo(a)pyrene	0.14 to 2.6	3 of 3	0.061 or MDL	1.3 (3)
		Benzo(b)fluoranthene	0.15 to 2.4	2 of 3	0.224 or MDL	1.3 (3)
		Benzo(k)fluoranthene	0.14 to 2.2	2 of 3	0.224 or MDL	1.3 (3)
		Chrysene	0.2 to 3.5	1 of 3	0.4	1.3 (3)
		Dibenzo(a,h)anthracene	0.056 to 0.93	3 of 3	0.014 or MDL	NA (3)
	Pesticides	NONE	NA	NA	NA	NA
	PCBS	NONE	NA	NA	NA	NA
	Metals	Copper	7.9 to 33.8	3 of 3	25 or SB	16/110 (3)
		Iron (Fe)	8,770 to 11,800	3 of 3	2,000 or SB	20,000/40,000 (3)
		Zinc (Zn)	47.5 to 99.5	3 of 3	20 or SB	120/270 (3)
Subsurface Soil (mg/kg or ppm)	VOCs	Acetone	ND to 0.75	3 of 10	0.2	NA (2)
	SVOCs	Benzo(a)anthracene	ND to 2.6	3 of 10	0.224 or MDL	NA (2)
		Benzo(a)anthracene	ND to 7.6	3 of 3	0.224 or MDL	NA (2)
		Benzo(a)pyrene	ND to 1.9	3 of 10	0.061 or MDL	NA (2)
		Benzo(a)pyrene	ND to 8.3	3 of 3	0.061 or MDL	NA (2)
		Benzo(b)fluoranthene	ND to 1.3	3 of 10	0.224 or MDL	NA (2)
		Benzo(b)fluoranthene	ND to 8.3	3 of 3	0.224 or MDL	NA (2)
		Benzo(k)fluoranthene	ND to 1.8	3 of 10	0.224 or MDL	NA (2)
		Benzo(k)fluoranthene	ND to 8.2	3 of 3	0.224 or MDL	NA (2)
		Chrysene	ND to 2.4	3 of 10	0.4	NA (2)
		Chrysene	ND to 8.2	2 of 3	0.4	NA (2)
		Dibenzo(a,h)anthracene	ND to 0.48	2 of 10	0.014 or MDL	NA (2)
		2,4,5-Trichlorophenol	ND to 0.54	1 of 3	0.1	NA (2)
	Pesticides	NONE	NA	NA	NA	NA
	PCBs	NONE	NA	NA	NA	NA
	Metals	Arsenic (As)	1.2 to 700	5 of 10	7.5 or SB	3 to 12** (2)
		Barium (Ba)	6.3 to 1,390	1 of 10	300 or SB	15 to 600 (2)
		Beryllium (Be)	0.24 to 0.68	10 of 10	0.16 or SB	0 to 1.75 (2)
		Cadmium (Cd)	ND to 23.4	1 of 10	10	0.1 to 1 (2)
	Metals	Chromium (Cr)	ND to 9,870	4 of 10	50	1.5 to 40** (2)
		Copper (Cu)	1.6 to 459	3 of 10	25 or SB	1 to 50 (2)
		Iron (Fe)	5,610 to 107,000	10 of 10	2,000 or SB	2,000 to 550,000 (2)

TABLE 1.5.1-1 SUMMARY OF CONTAMINANTS OF CONCERN FOR EACH MEDIA						
Media	Class	Contaminant of Concern	Detected Concentration Range	Frequency of Exceeding Standard	Applicable SCG (1)	Eastern USA Background (2) Or Sediment Criteria (3)
Subsurface Soil (con't)		Mercury (Hg)	ND to 27.3	4 of 10	0.1	0.001 to 0.2 (2)
		Nickel (Ni)	3.2 to 71.6	2 of 10	13 or SB	0.5 to 25 (2)
		Selenium (Se)	ND to 4.1	1 of 10	2 or SB	0. to 3.9 (2)
		Zinc (Zn)	12.5 to 990	6 of 10	20 or SB	9 to 50 (2)
Ground-water (Wells) (ug/l or ppb)	VOCs	Benzene	ND to 3	1 of 13	1	NA
		Ethylbenzene	ND to 10	3 of 13	5	NA
		Total Xylenes	ND to 75	4 of 13	5	NA
	SVOCs	Naphthalene	ND to 130	4 of 13	10	NA
		Pentachlorophenol	ND to 3	1 of 13	1	NA
		Phenol	ND to 22	1 of 13	1	NA
	Pesticides	NONE	NA	NA	NA	NA
	PCBs	NONE	NA	NA	NA	NA
	Metals	Antimony (Sb)	ND to 54.9	1 of 13	3	NA
		Arsenic (As)	ND to 4,780	7 of 13	25	NA
		Chromium (Cr)	ND to 148	1 of 13	50	NA
		Iron (Fe)	332 to 33,900	13 of 13	300	NA
		Magnesium (Mg)	4,170 to 72,800	2 of 13	35,000 (GV)	NA
		Manganese (Mn)	33.8 to 7,420	6 of 13	300	NA
		Sodium (Na)	6,600 to 3,910,000	10 to 13	20,000	NA

Table Notes:

(1) Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994, Revised April 1995 for soil. NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Effluent Limitations, June 1998 for groundwater and surface water.

(2) Eastern USA background concentrations as reported in a 1984 survey of reference material by E. Carol McGovern, NYSDEC.

(3) NYSDEC Technical Guidance for screening Contaminated Sediments, Human Health Bioaccumulation

(4) EPA provided analytical data (exceedances only). No data validation was been performed.

GV Guidance Value

** New York State Background

*** Background levels for lead varies widely. Average background levels in metropolitan areas near highways are much higher and typically range from 200 to 500 mg/kg or ppm. The EPA's Interim Lead Hazard Guidance (7/14/94) establishes a residential screening level of 400 kg/kg or ppm.

This table does not present those compounds detected below applicable SCGs.

The fate and transport of the contaminants are based on the physical and chemical properties of the compounds and the site characteristics. This section defines and discusses the general characteristics of the contaminants which affect the fate and transport, the specific characteristics of the contaminants identified within the site, the site conditions which impact fate and transport, the transport off-site of the contaminants within the groundwater, surface water and soil vapor, and the fate of the contaminants in terms of transformation and degradation.

6.2 Definition of Relevant Properties

Due to their similar composition, the site contaminants have some general characteristics and behavior in common. Characteristics which affect fate and transport include density, organic carbon/water partition coefficient, solubility in water, volatility, and degradability.

The following table presents various properties of the known and potential contaminants of concern. The density of a contaminant describes the weight of the contaminant relative to water, where one is the weight of water. The volatile organic compounds typically have a specific gravity value less than 1, and the semi-volatile compounds and metals which have specific gravity value greater than 1. Therefore, separate phase volatile organic compounds would have a tendency to float within the upper portions of the aquifer whereas the semi-volatile organic compounds and metals would tend to migrate vertically downward. At the subject site, the depth to the water table was observed to be approximately 3 to 11 feet below grade outside the buildings and 1 to 3 feet below the surface of the concrete floor in the secondary tannery building. A lower permeability glacial till or silt exists at depths from 8 to 16 feet below grade.

Physical and Chemical Properties of Site Contaminants

Compound	Density	Kow[1]	Koc[2]	Water Solubility[3]	Henry's Law Constant[4]
Volatile Organic Compounds:					
Benzene	0.879	2.12	83	1.75E+06	5.59E-03
Ethylbenzene	0.867	3.15	1100	1.52E+05	6.43E-03
O-Xylene	0.8802	2.95	363	1.52E+02	5.27E-03
M-Xylene	0.8642	3.20	363	1.58E+02	7.00E-03
P-Xylene	0.8610	3.18	363	1.98E+02	7.10E-03

Compound	Density	Kow[1]	Koc[2]	Water Solubility[3]	Henry's Law Constant[4]
Semi-Volatile Organic Compounds:					
Benzo(a)anthracene	1.274	5.90	1,380,000	1.20E-02	2.30E-06
Benzo(a)pyrene	1.351	6.00	5,500,000	3.90E-03	2.40E-06
Benzo(b)fluoranthene	NDA	6.57	550,000	1.40E-02	1.20E-05
Benzo(k)fluoranthene	NDA	6.85	550,000	5.50E-04	1.04E-03
Chrysene	1.274	5.61	200,000	1.80E-03	7.26E-20
Naphthalene	1.145	3.36	1,300	3.00E+01	4.60E-04
Dibenzo(a,h)anthracene	1.282	6.19	1,668,800	5.00E-03	7.33E-09
Pentachlorophenol	1.978	5.01	4365	2.00E+01	2.10E-06
Phenol	1.0576	1.46	27	8.20E+04	2.70E-07
2,4,5-Trichlorophenol	1.678	3.85	89	1.19E+03	1.76E-04
Metals:					
Arsenic	5.73	NA	NA	0.3	NA
Barium	3.51	NA	NA	1.5	NA
Beryllium	1.848	NA	NA	NDA	NA
Chromium	7.14	NA	NA	0.2	NA
Copper	8.94	NA	NA	0.12	NA
Iron	7.86	NA	NA	NDA	NA
Magnesium	1.74	NA	NA	NDA	NA
Manganese	7.43	NA	NA	NDA	NA
Mercury	13.53	NA	NA	2.0E-21	NA
Nickel	8.9	NA	NA	6.1	NA
Selenium	4.79	NA	NA	NDA	NA
Sodium	0.97	NA	NA	Decomposes	NA
Zinc	7.14	NA	NA	1.0E-4	NA

References: Superfund Public Health Evaluation Manual; EPA/540/189/002; Hawley's Condensed Chemical Dictionary, Twelfth Edition; Howard, Philip H., Fate and Exposure Data for Organic Chemicals. Vols. 1&2. 1989; and Robert C. Knox and others, Subsurface Transport and Fate Processes, 1993; Wilson & Clarke, Hazardous Waste Site Soil Remediation, Theory and Application of Innovative Technologies, 1994.

NDA denotes no data available in cited references.

NA denotes not applicable.

(1) Log octanol/water partition coefficient.

(2) Organic carbon partition coefficient. Often a range is available rather than a single number.

(3) mg/l at 25 degrees C.

(4) Henry's Law constant, atm-m^3 / mole.

6.3 Contaminant Persistence

The organic carbon/water partition coefficient (Koc) indicates the tendency of an organic contaminant to sorb onto soil or sediment particles for nonionic, undissociated chemicals such as the site contaminants (VOCs and SVOCs). Where the Koc is not experimentally available, it can be calculated based on the log octanol/water partition coefficient. The Koc multiplied by the organic carbon content of a given soil gives the estimated absorption partition coefficient (K_d) for that soil. Some absorption may occur between contaminants and inorganic soil or sediment particles, particularly clay. However, experimental data indicates that the absorption of nonoionic, undissociated chemicals to inorganic soil or sediment is low. Once the sorption sites in soil are used up, mobility will usually increase to some extent.

Mobility is expected to be lowest in surface soils, which tend to have some organic carbon. Below several feet in depth, the organic carbon content of soils is likely to be very low, and even a compound with a high Koc will be moderately mobile. The VOCs have organic carbon partition coefficients of 21 for methylene chloride and 240 for xylenes, indicating low sorption and high mobility. The SVOCs have a wide range of organic carbon partition coefficients, from 5,500,000 for benzo(a)pyrene, indicating medium to high sorption and low to medium mobility in soil, to 89 for 2,4,5-trichlorophenol, indicating low sorption and high mobility.

The mobility of metals is affected by geologic conditions, and is often gauged by the environment's oxidation/reduction (redox) potential. As the pH and dissolved oxygen vary, the solubility of metals can change substantially. Generally, but not always, reductive conditions favor the solid phase of the metal, so a change toward reducing conditions can precipitate soluble metals, making them immobile. Accordingly, the metals of concern do not have an associated Koc value.

Water solubility indicates the tendency of a compound to dissolve in and travel in water. When contaminant concentrations are above approximately ten percent of the water solubility, a separate phase will tend to form. As the water solubility values of the volatile and semi-volatile organic contaminants in groundwater vary but are on the order of 198,000 to 1,750,000,000 mg/l (VOCs) and 20,000, 30,000, and 8,200,000 mg/l (SVOCs), and the actual concentration of the contaminants detected within the site are much less than the water solubility values for the contaminants within the site, separate

phase layers are not likely to exist within the site. A separate phase layer may be influenced by the gradient of the water table if the density of the contaminant is less than 1, and may also migrate across or against groundwater flow along the slope of a low permeability layer if the contaminant has a density greater than 1. The site contaminants (except for metals) have a wide range of solubilities, but are generally soluble. The majority of the metals of concern, with the exception of calcium and sodium, are nearly insoluble in water.

Volatility is quantified by Henry's constant (K_h) in diffuse aqueous conditions such as occur in groundwater at the subject site. The rate of volatilization increases as K_h increases. Volatility increases with decreases in atmospheric pressure, increase in temperature and when the compound vapor pressure is low relative to saturation. The contaminants of concern (except for metals, which are not volatile) are volatile and semi-volatile organic compounds, which means that they volatilize at some rate when unsaturated vapor, such as soil gas or the open atmosphere, are present. VOC and SVOC contaminants in surface water or surface soil thus volatilize quickly to the atmosphere. With the exception of the SVOCs, the density of the VOCs is typically lighter than water. These compounds typically migrate vertically within the vadose zone due to capillary forces. In the subsurface soils, these compounds commonly dissolve in the groundwater in the saturated and vadose zone. The VOCs in a dissolved state within the groundwater tend to volatilize into the vadose zone.

Due to the chemical composition of metals, metals do not typically biodegrade. The lighter petroleum hydrocarbon contaminants biodegrade readily. The heavier semi-volatile organic compounds biodegrade at a slower rate, primarily under anaerobic conditions. Biodegradation of VOCs and SVOCs in soil/groundwater has been found to occur under aerobic and to a lesser extent anaerobic conditions, such as occurs in groundwater. The presence of acclimatized microbes, which are likely to occur within the site, enhances biodegration of VOCs and SVOCs. Acclimatized microbes are soil micro-organisms which have adapted themselves to the contaminants by producing enzymes to withstand toxic effects and to allow metabolism of the contaminants. Addition of nutrients would be expected to increase the rate of biotic degradation.

6.4 Contaminant Migration

The potential routes of contaminate migration is through surface water, groundwater, and the atmosphere. Surface water migration is a potential contaminant route for this project since a low flowing creek enters the site, traverses through the site and travels off-site. Contaminants could dissolve, depending on their solubility, within surface water or groundwater and be transported in the direction of groundwater and surface water flow. They could also be transported downstream during periods of high stream flow. Contaminants present in the vapor phase of the unsaturated zone of soil, above groundwater, and released from the vadose zone could emanate out of the soil to the open atmosphere, depending on the contaminant's volatility and depth of soil cover.

6.4.1 Groundwater Migration

As both heavier than and lighter than water volatile and semi-volatile organic compounds, and metals are present within the site, there may be migration of contaminants occurring within the upper portions of the aquifer and along the top of the lower, less permeable glacial till. It is expected that the lighter VOC will be migrating in the direction of the groundwater flow. Similar migration patterns for the heavier semi-VOCs may occur, but could also be influenced by the surface topography of the underlying glacial till soils. The majority of the metals detected are insoluble in water and tend to adsorb and absorb soil particles, therefore, have difficulty migrating with groundwater. For the metals, which are highly soluble in water (calcium and sodium), their migration in groundwater is likely occurring.

Based on monitoring well data, groundwater at the site appears to be converging toward the Cayadutta Creek with easterly and westerly flow components. The average hydraulic gradient on the east side of the site was calculated to be on average 6.34×10^{-2} ft/ft, and at a velocity of approximately 1.27×10^{-6} ft/min, assuming a coefficient of permeability of 2×10^{-5} ft/min for sand, silt, and clay mixture soils. The average hydraulic gradient on the west side of the site was calculated to be on average 2.43×10^{-2} ft/ft, and at a velocity of approximately 4.86×10^{-7} ft/min, assuming a coefficient of permeability of 2×10^{-5} ft/min for sand, silt, and clay mixture soils.

Generally, groundwater contamination consists of residual levels of benzene, ethylbenzene and xylenes that were detected beneath the secondary tannery building

within the east side of the site and within two locations within the west side of the creek (one beneath the building and one within the extreme southern portion of the site; naphthalene and phenol beneath the secondary tannery building; pentachlorophenol and naphthalene isolated at MW-7; and various metals (notably arsenic and chromium) that were detected beneath and immediately outside the on-site buildings at elevated levels. In some cases, the groundwater flow direction beneath buildings is affected or impeded by foundations and floor slabs. Since the water table was observed immediately beneath the floor slab and water table elevations were similar to the water table outside the building, groundwater flow beneath the building may be affected by the tannery building's buried footings and other structures. Groundwater movement beneath the building may migrate at a rate greater than the groundwater flow outside of the buildings depending on the type of fill material placed around and beneath the surface structures. Using the calculated groundwater velocity, contaminants would likely migrate very slowly, at a rate less than 1 feet per year. Additionally, there are likely to be other physical and chemical factors involved which may impeded the migration rate of the contaminants in the groundwater including natural biodegradation, bio-accumulation by organic materials, sorption onto soil particles, and volatilization into the vadose zone and the unsaturated soils.

Analytical results for soil samples collected from beneath the building suggest that concentrations of ethylbenzene, xylenes, naphthalene, most "benzo" related semivolatile organic compounds, arsenic and chromium are elevated in the area of surface soil sample SS-8, and monitoring wells MW-13 and MW-15. Analytical results also indicate elevated concentrations of similar compounds and analytes at MW-7, MW-8 and MW-10. These potential source areas may be contributing to the contaminated groundwater in this portion of the site. Petroleum grade fuels and solvents, arsenic and chromium were commonly used in tanning operations and through the years of use they may have entered the soil and groundwater beneath the buildings.

6.4.2 Surface Water Migration

Similar to groundwater, VOC contaminants, being lighter that water, would tend to remain in the upper portions of the creek and flow in the direction of the surface water pattern. SVOC and metal contaminants (those insoluble in water) suspended in surface water may settle out in low flow conditions since the specific gravity is heavier than water. There were no VOCs, SVOCs, pesticides, PCBs, or cyanide detected above

standard values in the surface water samples suggesting that there is no ongoing source of surface water migration of these contaminants. Aluminum and iron were the only metals detected above SCGs within upstream locations, therefore, the historical site use does not appear to be altering the surface water quality at the site. Furthermore, aluminum was not elevated within the sediment samples, and therefore there doesn't appear to be a source of on-going site-related contamination.

The sediment samples revealed low levels of six SVOCs above standards which have the potential of dissolving in water and migrating downstream. The sediment samples revealed some metals above standards, but these analytes are insoluble and do not readily dissolve in water. As the solubility of the SVOCs and metals are relatively low, the occurrence of these contaminants in the surface water in soluble forms is low. However, during storm events when high flow conditions prevail, the sediments may be disturbed and migrate downstream.

6.4.3 Atmospheric Migration

Site contaminants (VOCs and SVOCs) within the soil vapor will diffuse slowly upward and horizontally to unsaturated soil vapor. At the soil surface, where an impermeable barrier does not exist, contaminants within the surface soil vapor will diffuse to the atmosphere. The rate of diffusion into the atmosphere depends on the differential in vapor saturation and in the atmospheric pressure. Under natural soil conditions, the differential is expected to be low within the soil. At the soil/atmosphere interface, the differential can change frequently, with great increases in differential causing contaminants to transport rapidly from surface soil to the atmosphere. Site contaminants which may volatilize from the site soils to the atmosphere will disperse or abiotically degrade, with rates dependent on wind speed and levels of atmospheric radicals, respectively. Since the levels of contaminants are relatively low level, VOC and SVOC contaminants in the atmosphere are not expected to accumulate at detectable levels under existing conditions. Metals do not exhibit volatility, therefore, would not likely enter the atmosphere unless site soils were disturbed such that dust particles with metals adhered to them enter the atmosphere.

7.0 SUMMARY AND CONCLUSIONS

7.1 Summary

The site investigation work tasks have been completed in substantial conformance with the Final Site Investigation/Remedial Alternatives Report Work Plan dated November 2001. Any deviations to the final approved work plan have been described within the body of this report.

7.1.1 Nature and Extent of Contamination

The primary contaminants of concern within the site are heavy metals in surface and subsurface soils and groundwater. Other contaminants of concern, although much less prevalent and severe are volatile and semi-volatile organic compounds in the same media.

There were a variety of contaminants detected within various media, these being a few VOCs and SVOCs, and several metals. No pesticides or PCBs were identified as contaminants of concern based on the investigations performed. The VOCs and SVOCs are likely related to petroleum grade fuels, defatting agents and coal for the reasons provided in the SI Report. These compounds were documented to exist within the site's surface and subsurface soil and to a lesser extent in groundwater and are likely related to the former tannery processes. Metals were detected in site's surface and subsurface soil and groundwater. With the exception of arsenic, chromium, iron, mercury and sodium, the concentrations of metals within soil were less than the regulatory clean-up standards and/or within normal background ranges for Eastern USA soils, or are not expected to have been used in the tannery process. The concentrations of metals in groundwater were all within regulatory groundwater standards except for antimony, arsenic, chromium, iron, magnesium, manganese and sodium. Antimony and manganese are not considered contaminants of concern due to their non-use in the tannery process.

Evidence of free-phase petroleum product was identified within the excavation of the bottom-half of a 20,000-gallon former fuel oil tank. EPA removed the tank and contaminated soils within the tank, but sampling of the underlying soil did not identify contaminants and was placed back in the excavation. Based on a visual observations

made while the excavation was open, a small amount of black oil appeared to be leaking through the cracks in the below grade block foundation wall of the former tank. Therefore, this oil, in the absence of supporting analytical data, is considered to be a contaminant of concern.

7.1.2 Fate and Transport

The site contaminants are metals and to a lesser extent volatile and semi-volatile organic compounds. The elevated concentrations of these contaminants were found both beneath and outside the existing buildings in surface and subsurface soils and groundwater. The VOCs and SVOCs within the groundwater in a dissolved phase, and the VOCs and SVOCs in soil are adsorbed to soil particles.

The fate of the VOCs and SVOCs are influenced by several factors including the contaminant compounds' organic carbon/water partition coefficients, water solubility, volatility and ability to biodegrade by natural processes. Metals are not generally influenced by these factors, except for solubility. The VOCs and SVOCs have low to high organic carbon sorption capacity (water partition coefficients). This indicates that the contaminants have an affinity to be absorbed by organic carbon within the site soils, primarily within the upper soil horizon where the organic carbon within the project site would tend to be more prevalent. With high organic carbon content of the soil, the mobility of contaminants will typically decrease. In the absence of organic carbon (as is the case for the Independent Leather site) or once the sorption sites have been expended, the mobility of the contaminants will usually increase. Some absorption may occur between the contaminants and inorganic soil and sediment particles; however, literature suggests that the absorption of nonionic chemicals to inorganic soil is low.

Each of the VOC and SVOC contaminants remaining in the groundwater and soil are relatively soluble in water. None of the VOC or SVOC contaminant concentrations within the site approach the lower end of this solubility range. As a limited number of VOCs and SVOCs are present within the groundwater in dissolved state, they will generally migrate in the direction of groundwater flow. Metals are generally insoluble and will not typically migrate in the direction of groundwater flow unless attached to a colloid or are soluble in groundwater (i.e. sodium).

Metals are not capable of volatilization. The VOCS and SVOCs are volatile to some degree, which indicates they will volatilize readily when unsaturated vapor, such as soil gas or ambient air is present. Contaminants which may volatilize from the groundwater or soils to the atmosphere will disperse or abiotically degrade at rates dependent upon wind speed and the levels of atmospheric radicals. These rates are anticipated to be undetectable based on the low level concentrations of these contaminants.

Metals, because of their chemical composition, do not biodegrade. The VOCs and SVOCs are biodegradable. Biodegradation of the site contaminants has been found to occur under aerobic and anaerobic conditions. The volatile and semi volatile organic compounds will readily biodegraded under aerobic conditions, where as the heavier hydrocarbons will biodegrade more readily under anaerobic conditions. Microorganisms within the soils which have been acclimated to the contaminants by producing enzymes to withstand the toxic effects can readily metabolize the contaminants, particularly when the nutrients are used to amend the soils.

The transport mechanisms for the contaminants within the site are migration within the groundwater, surface water, and/or volatilization into the atmosphere. The petroleum fuel related compounds tend to occur and migrate within the upper portions of the aquifer due to their densities being less than 1. The semi-VOCs will tend to sink to the bottom of the aquifer to a less permeable soil type and migrate in the direction of groundwater flow and/or the surface of the less permeable unit. Most metals are strongly held, reducing their migration and extent of contamination. VOC and SVOC contaminants within the groundwater and vadose zone will volatilize into the unsaturated soils above the water table, and eventually will diffuse into the atmosphere.

7.2 Conclusions

From the initial site investigations, the levels of some metals within surface and subsurface soils, and groundwater at the subject site exist at levels which warrant remedial action. VOCs and S-VOCs were also found to exist at relatively low concentrations where identified within the site and may also warrant remedial action.

Based upon the findings and conclusion of this site investigation, additional investigative activities are not considered warranted at this time. The site investigation has adequately delineated the presence and extent of the contaminants of concern identified for the site. Further investigations would be necessary during the design phase of the selected remedial actions to refine the areas of concern and gather additional information necessary to complete the remedial design. However, the existing data is considered to be sufficient for the preparation of the Remedial Alternatives (RA) Report. The RA Report presents and discusses potential options for addressing the contaminants of concern.

7.2.1 Data Limitations and Disclaimer

All of the analytical data for this project was subjected to data validation by Ms. Judy Harry of Data Validation Services of North Creek, New York in accordance with Data Usability Summary Report (DUSR) Guidelines. Due to the separate phases or work tasks of the project, several separate ASP Category B deliverables were submitted to Data Validation Service for validation. One comprehensive DUSR was generated by Data Validation Services for this project, covering a variety of Category B deliverable packages. A list of the ASP Category B packages is provided below:

- SDG No.: 200963 - Soil Analysis (Borings)
- SDG No.: 200990 - Soil Analysis (Borings)
- SDG No.: 201033 - Groundwater Analysis (Monitoring Wells)
- SDG No.: 201049 - Groundwater Analysis (Monitoring Wells)
- SDG No.: 201056 - Surface Soil, Creek Surface Water & Creek Sediment Analysis

The DUSR dated September 23, 2002 summarizes the review of the analytical data included within the data packages prepared by Severn Trent Laboratories. This DUSR is provided as Exhibit E, and is discussed briefly in the following paragraphs.

The DUSR pertains to the samples collected April 22, 2002 through May 10, 2002, which are fourteen soil samples (including one field duplicate), seventeen aqueous samples (including one field duplicate), three sediment samples, and associated equipment blanks (one for soil and one for groundwater), trip blanks (five sets) and sample matrix

spikes/duplicates. In general, the sample processing was primarily conducted in compliance with protocol requirements. The analytical data is therefore usable as reported or with minor qualification as estimated due to minor matrix or processing issues, with the exception of the following:

- Many of the pesticides reported detections that were likely matrix interference and were edited to nondetection, sometimes at elevated reporting limits.
- Cyanide results for the samples of the surface soil "SS" matrix were not usable due to matrix spike failure.
- One bromomethane detection was an evident transcription error, and is edited to nondetection.
- Mercury reporting limits for soils have been lowered from those submitted by the laboratory.

All of the qualifications to the analytical results, as discussed within the DUSR, are presented within the analytical summary tables, which are presented within the body of the report. Other issues of concern concluded by the data validation included that method detection limits (MDL) and reporting limits (RLs) were presented within the data package, but the RL values should be used as project reporting limits. In addition, due to the presence of specific compounds/analytes, the following sample detections are considered laboratory contamination and were edited to nondetecton:

Volatile organic compounds

- o all methylene chloride detections.
- o all acetone detections except MW-7, MW-13 and those samples within SDG No. 200990.
- o chloroform in MW-8 (2-4').

Semi-volatile organic compounds

- o di-n-butylphthalate in MW-8 (2-4').
- o bis(2-ethylhexyl)phthalate in all samples CS-1.
- o naphthalene in MW-11.

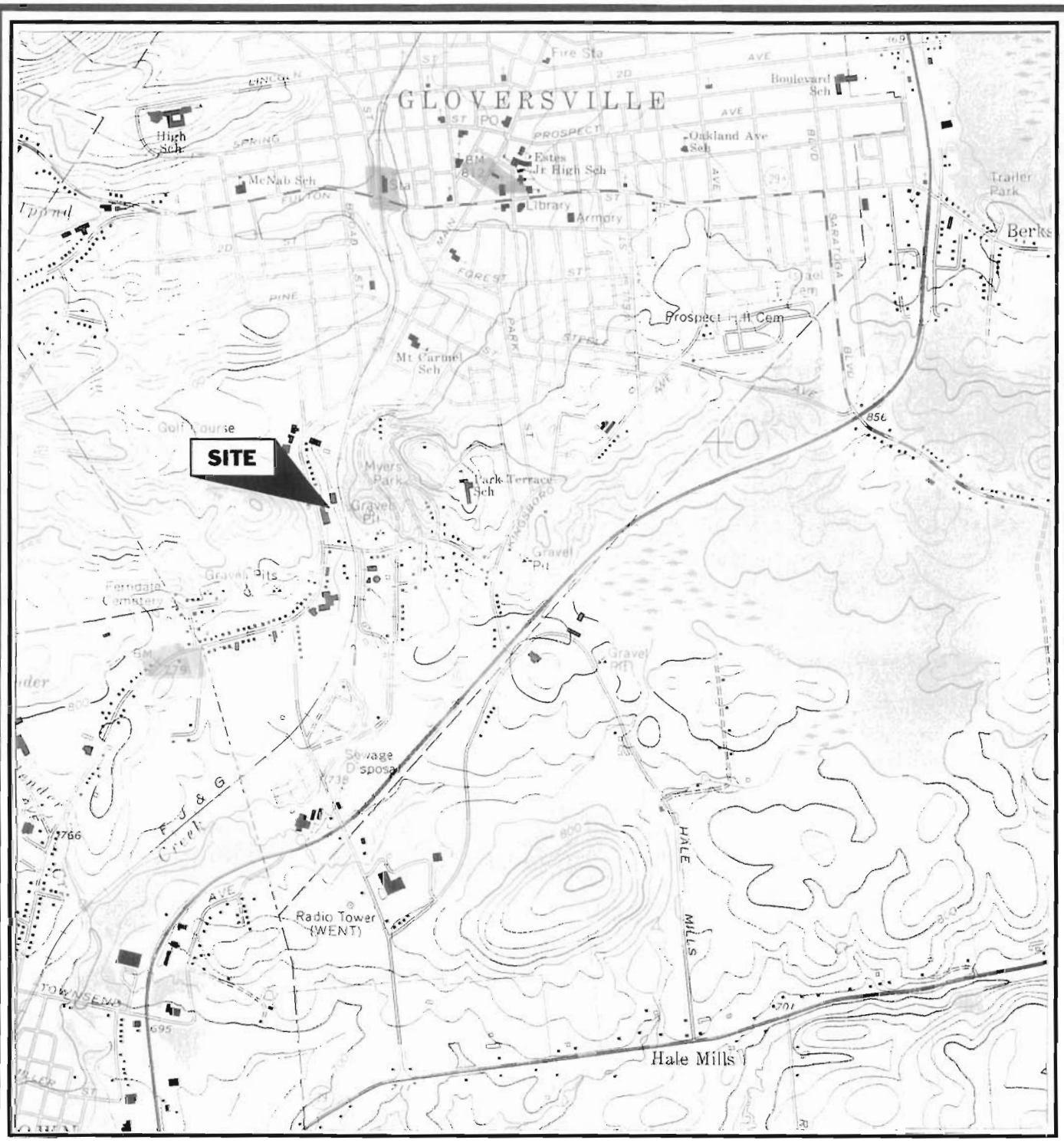
Metals

o chromium in MW-6 (2-4'), MW-7 (2-4'), MW-9 (2-4') and MW-14 (2-4').

As far as data completeness, the data packages provided are in compliance with NYSDEC ASP Category B requirements. Data package omissions are listed within the DUSR. In summary, the laboratory data is usable as presented within this SI Report. The summary tables presented within the appendices reflect the qualifiers applicable to the data. For those compounds determined not to be usable for this project, a "R" qualifier will be next to the results. Findings and conclusions presented with this report are based on the investigation conducted and validated data as described and may not be inclusive of all of the conditions at the site.

FIGURE 1

SITE LOCATION MAP



MAP REFERENCE

United States Geologic Survey
7.5 Minute Series Topographic Map
Quadrangle: Gloversville, NY
Date: 1970

N
W E
S

ENGINEERING
ENVIRONMENTAL SERVICES
SURVEYING
PHONE (518)786-7400
FAX (518) 786-7299

C.T.MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE, PO BOX 727, LATHAM, NY 12110

FIGURE 1 - SITE LOCATION MAP

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE	FULTON COUNTY, NY
SCALE: 1"=2000'±	
DRAFTER:JAM	
PROJECT NO. 01.7293	

FIGURE 2

BOUNDARY SURVEY

FIGURE 3

1970'S AERIAL PHOTOGRAPH

NO XREFS

DATE	REVISIONS RECORD/DESCRIPTION	DRAFTED	CHECK	APPR.
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DRAFTED : JAM

CHECKED : KM

FIGURE 3
1970'S AERIAL PHOTOGRAPH

INDEPENDENT LEATHER TANNERY

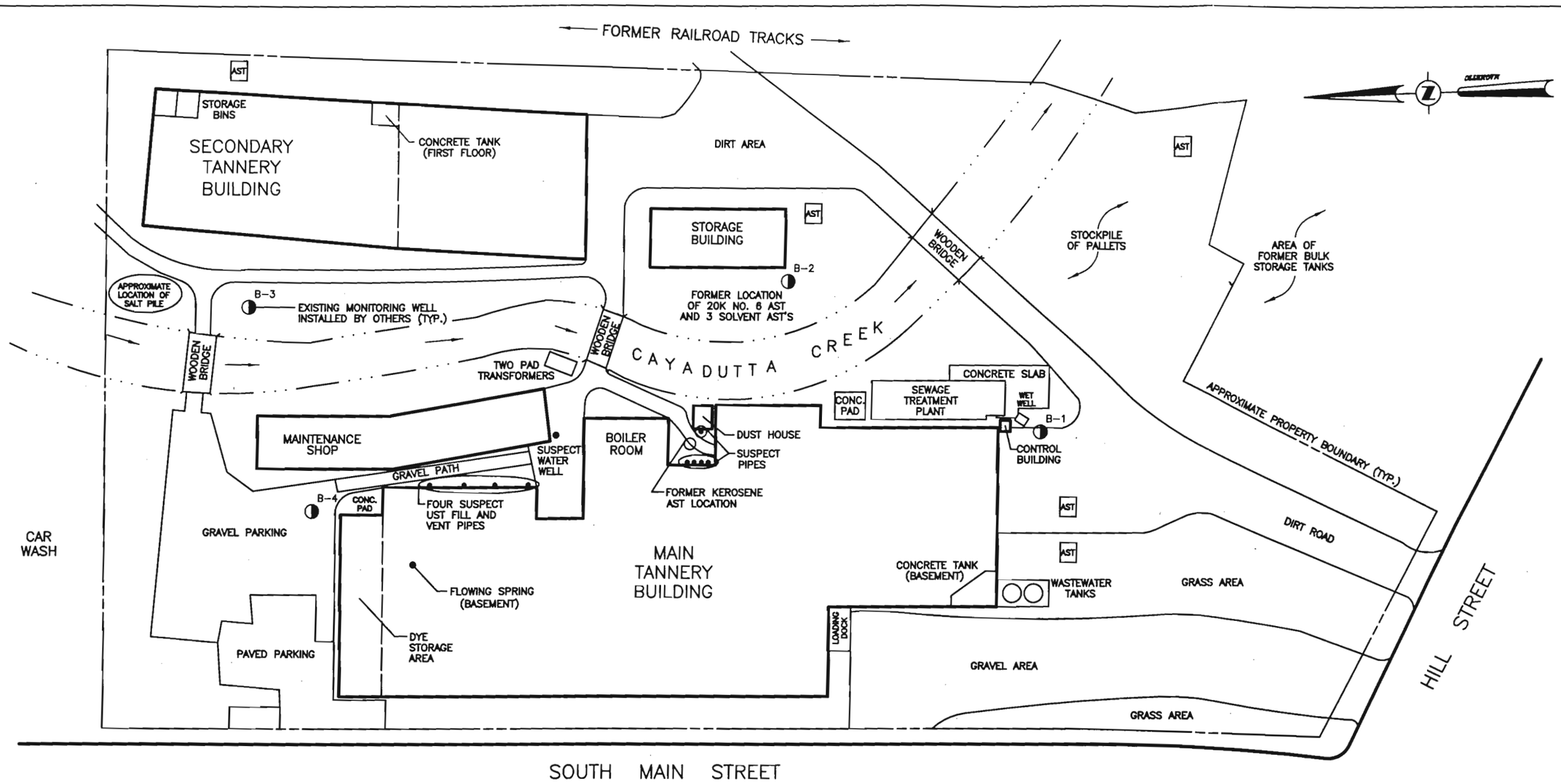
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.

JAME: IL AERIAL.DWG

FIGURE 4

SITE MAP PRIOR TO EPA EMERGENCY RESPONSE ACTION



LEGEND:

B-1
◑ EXISTING MONITORING WELLS B-1 THROUGH B-4

GENERAL NOTES:
1.) THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTED	CHECK	APPR.
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FIGURE 4
SITE MAP PRIOR TO EPA EMERGENCY RESPONSE ACTION

INDEPENDENT LEATHER TANNERY

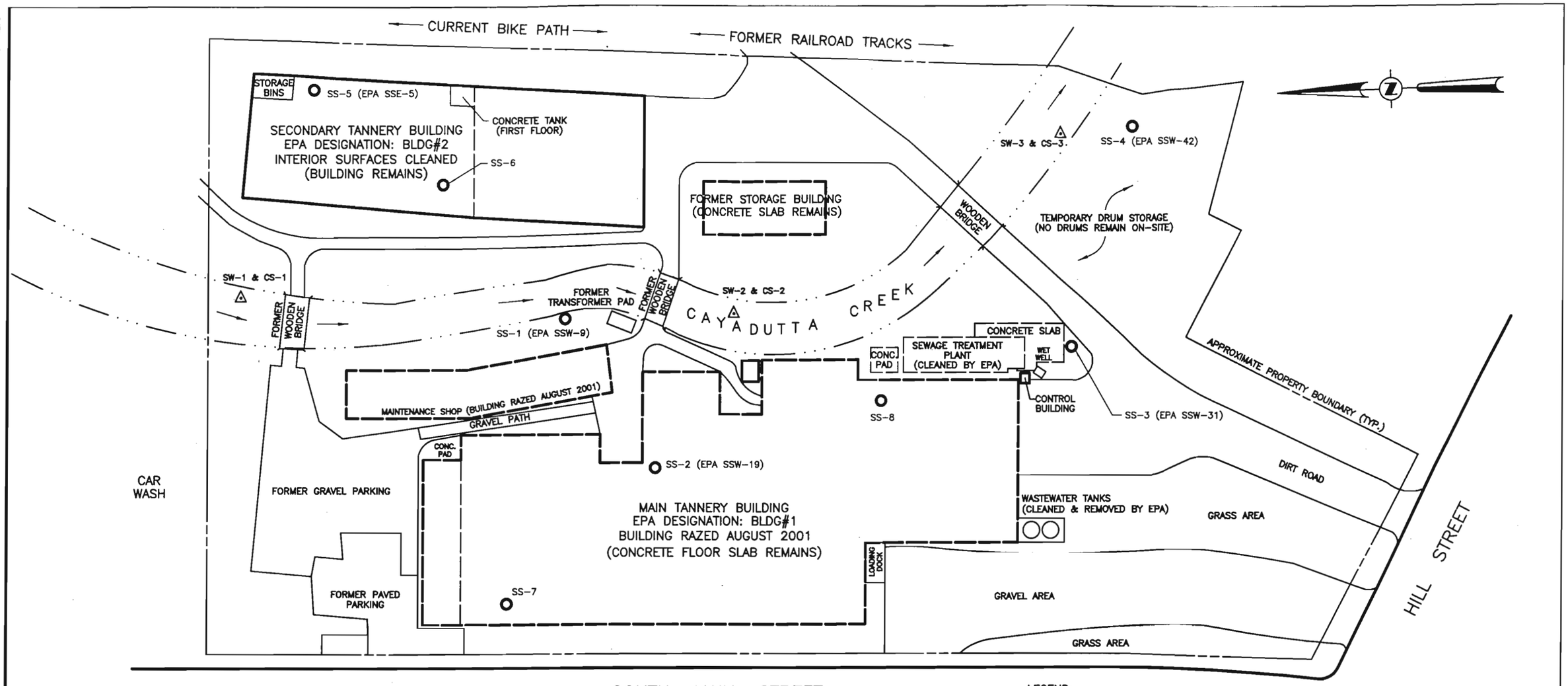
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.

FIGURE 5

SITE MAP SHOWING SURFACE SOIL, SURFACE WATER, AND SEDIMENT SAMPLE LOCATIONS

NO XREFS



LEGEND:

SW-3 & CS-3	SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND ID (TYP.).
SS-2 (EPA SSW-19)	SURFACE SOIL SAMPLING LOCATION AND ID (TYP.). ANALYSES WAS LIMITED TO SUPPLEMENT EPA ANALYTICAL DATA.
SS-7	SURFACE SOIL SAMPLING LOCATION AND ID (TYP.). THE LOCATION DOES NOT OVERLAP EPA SAMPLING POINTS, THEREFORE, COMPLETE PROJECT ANALYSES WAS PERFORMED.

GENERAL NOTES:
THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

2.) THE LOCATIONS OF EPA SAMPLING POINTS WERE ELECTRONICALLY PROVIDED BY EPA AND ARE APPROXIMATE.

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FIGURE 5
SITE MAP SHOWING SURFACE SOIL, SURFACE WATER, AND SEDIMENT SAMPLE LOCATIONS

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

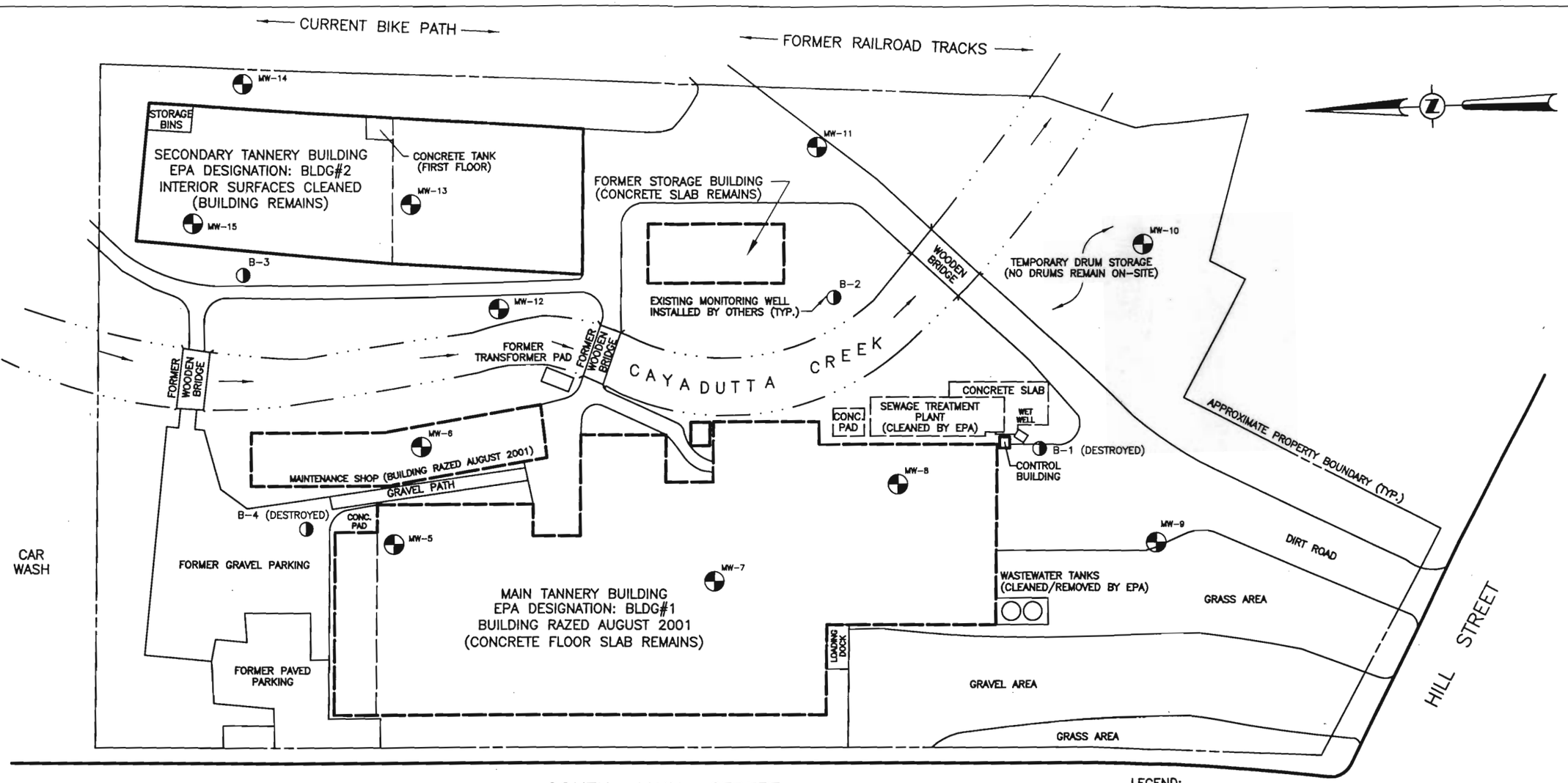
C.T. MALE ASSOCIATES, P.C.

NAME: SURF SOIL_V02.DWG

FIGURE 6

SITE MAP SHOWING TEST BORING & MONITORING WELL LOCATIONS

NO XREFS



GENERAL NOTES:
1.) THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

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FIGURE 6
SITE MAP SHOWING TEST BORING & MONITORING WELL LOCATIONS BY C. T. MALE

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

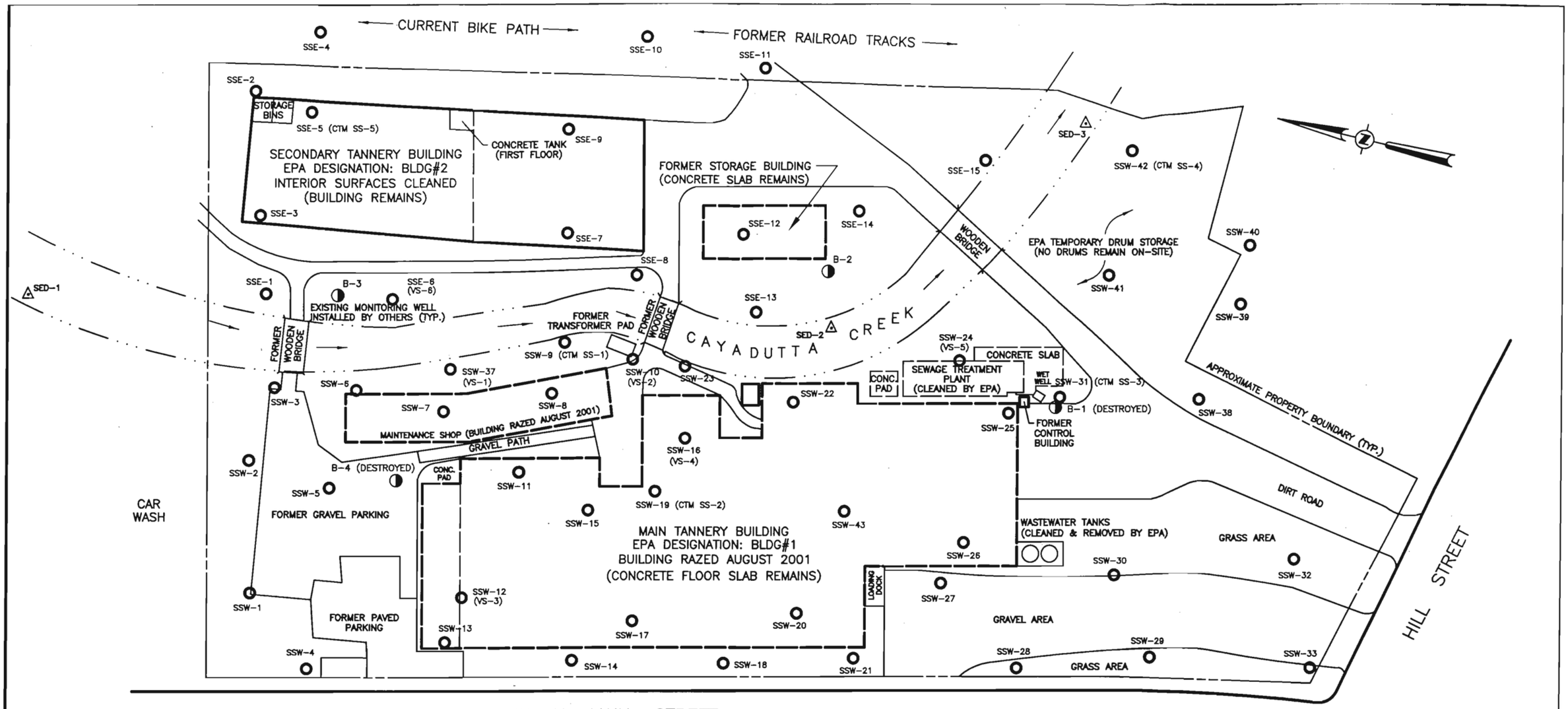
C.T. MALE ASSOCIATES

FILE NAME: BM_BORINGS_V02.DWG

FIGURE 7

SITE MAP SHOWING EPA SAMPLING LOCATIONS

NO XREFS



LEGEND:

- B-1 — EXISTING MONITORING WELLS B-1 THROUGH B-4
- SED-1 — EPA SEDIMENT SAMPLING LOCATION
- SSW-33 — EPA SURFICIAL AND/OR DEEP SAMPLING LOCATION
- SSW-19 (CTM SS-2) — EPA SURFICIAL SAMPLING LOCATION WITH CORRESPONDING C.T. MALE (CTM) SAMPLE IDENTIFICATION NUMBER

GENERAL NOTES:
1.) THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

2.) THE LOCATIONS OF EPA SAMPLING POINTS WERE ELECTRONICALLY PROVIDED BY EPA AND ARE APPROXIMATE.

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FIGURE 7
SITE PLAN MAP SHOWING EPA SAMPLING LOCATIONS

INDEPENDENT LEATHER TANNERY

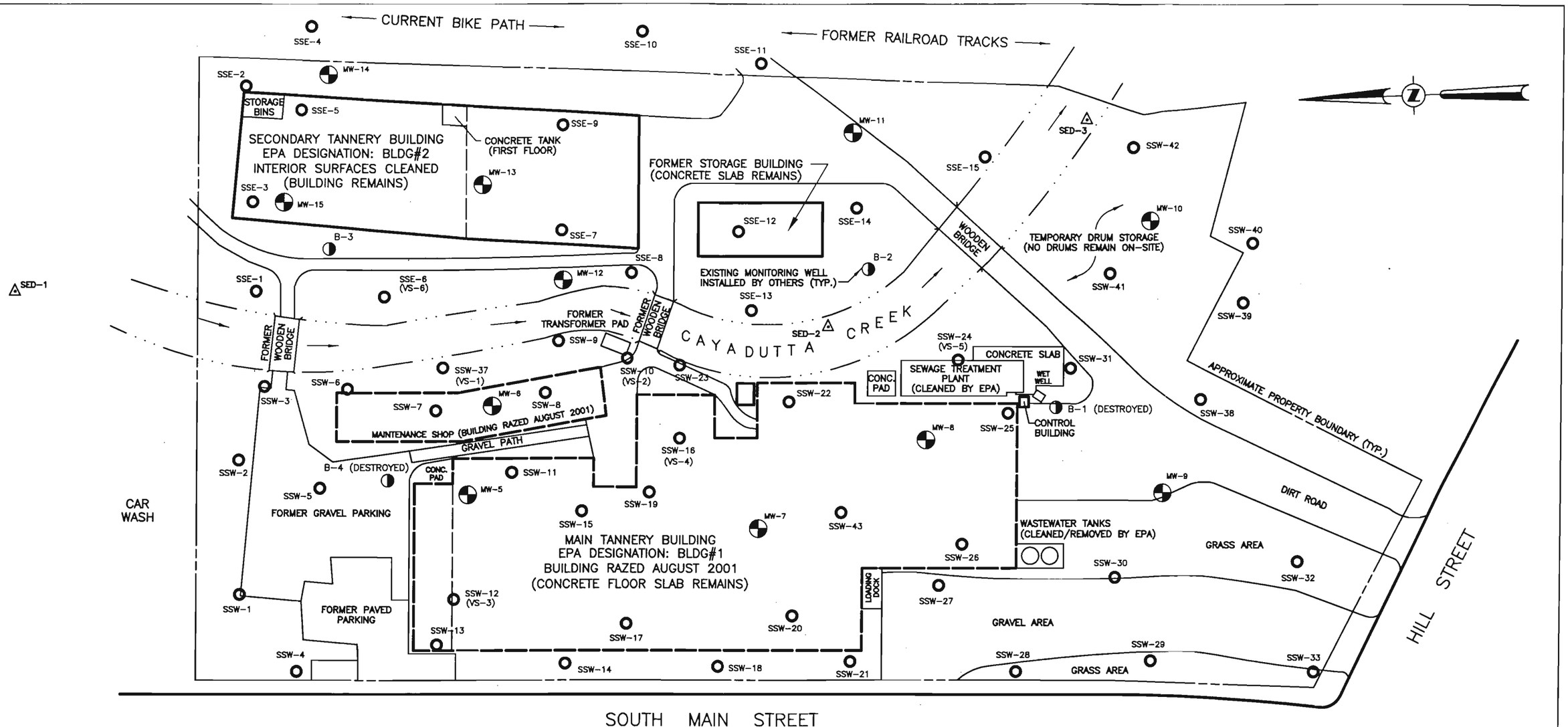
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

FILE NAME: BM_EPA_V02.DWG

FIGURE 8

SITE MAP SHOWING TEST BORING & MONITORING WELL LOCATIONS BY C.T. MALE AND EPA SAMPLING LOCATIONS

NO XREFS



LEGEND:

- B-1 — EXISTING MONITORING WELLS B-1 THROUGH B-4
- SSW-33 — EPA SURFICIAL AND/OR DEEP SAMPLING LOCATION
- SED-1 — EPA SEDIMENT SAMPLING LOCATION
- MW-5 — C.T. MALE TEST BORING & MONITORING WELL LOCATIONS

GENERAL NOTES:
THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

2.) THE LOCATIONS OF EPA SAMPLING POINTS WERE ELECTRONICALLY PROVIDED BY EPA AND ARE APPROXIMATE.

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FIGURE 8 -SITE MAP SHOWING TEST BORING & MONITORING WELL LOCATIONS BY C. T. MALE AND EPA SAMPLING LOCATIONS

INDEPENDENT LEATHER TANNERY

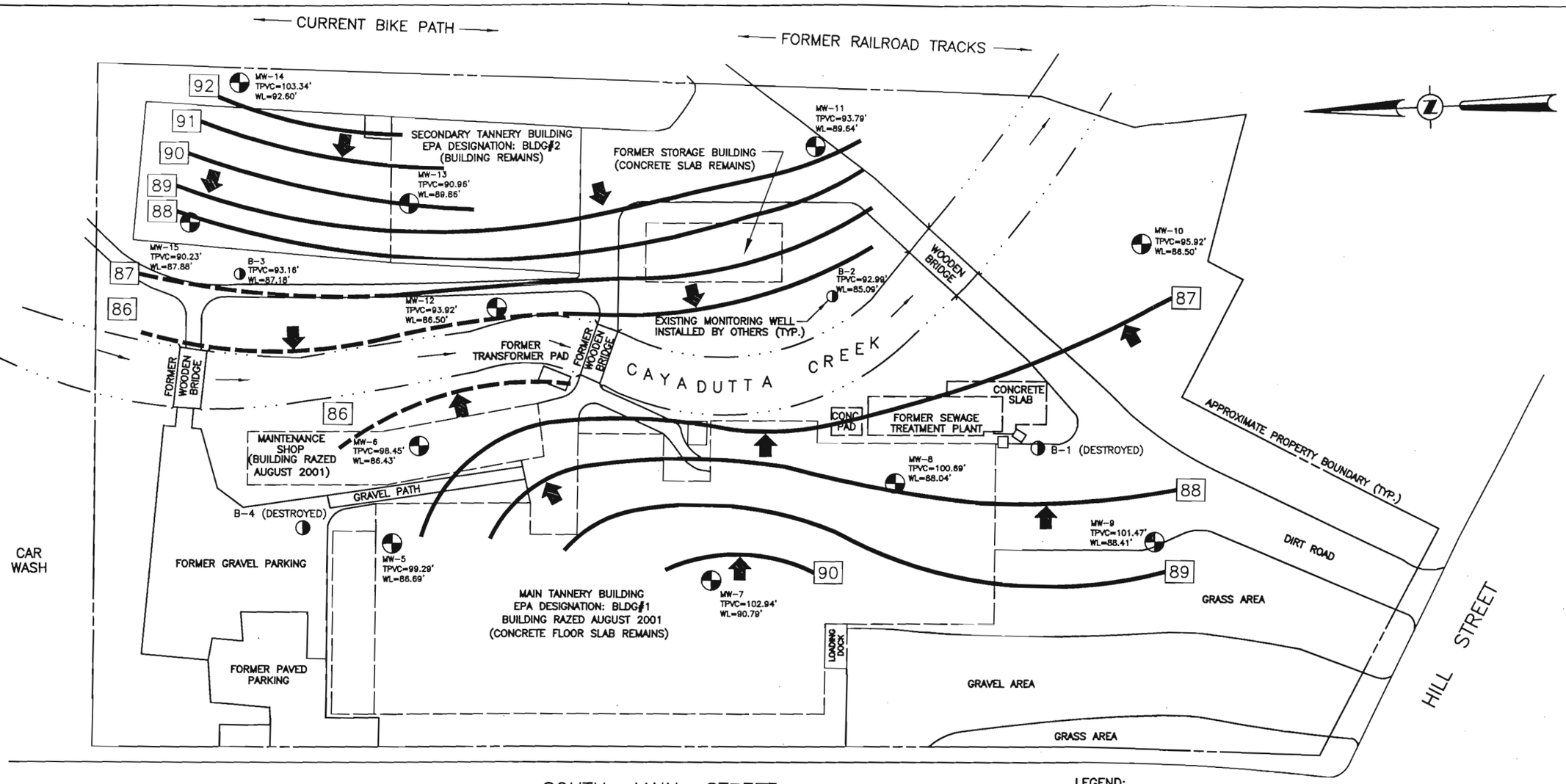
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.

FILE NAME: BM_CTM_EPA_V02.DWG

FIGURE 9

GROUNDWATER CONTOUR MAP FOR APRIL 30, 2002



LEGEND:

- B-1 — EXISTING MONITORING WELLS B-1 THROUGH B-4
- MW-5 — C.T. MALE TEST BORING & MONITORING WELL LOCATIONS
- 88 — GROUNDWATER CONTOUR LINE. DASHED WHERE INFERRED. ARROW DEPICTS DIRECTION OF GROUNDWATER FLOW BASED ON APRIL 30, 2002 WATER LEVELS.

ENERAL NOTES:
) THE LOCATIONS AND FEATURES
EPICTED ON THIS MAP ARE APPOXIMATE
ND DO NOT REPRESENT AN ACTUAL
ELD SURVEY.

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FIGURE 9
GROUNDWATER CONTOUR MAP FOR APRIL 30, 2002

INDEPENDENT LEATHER TANNERY

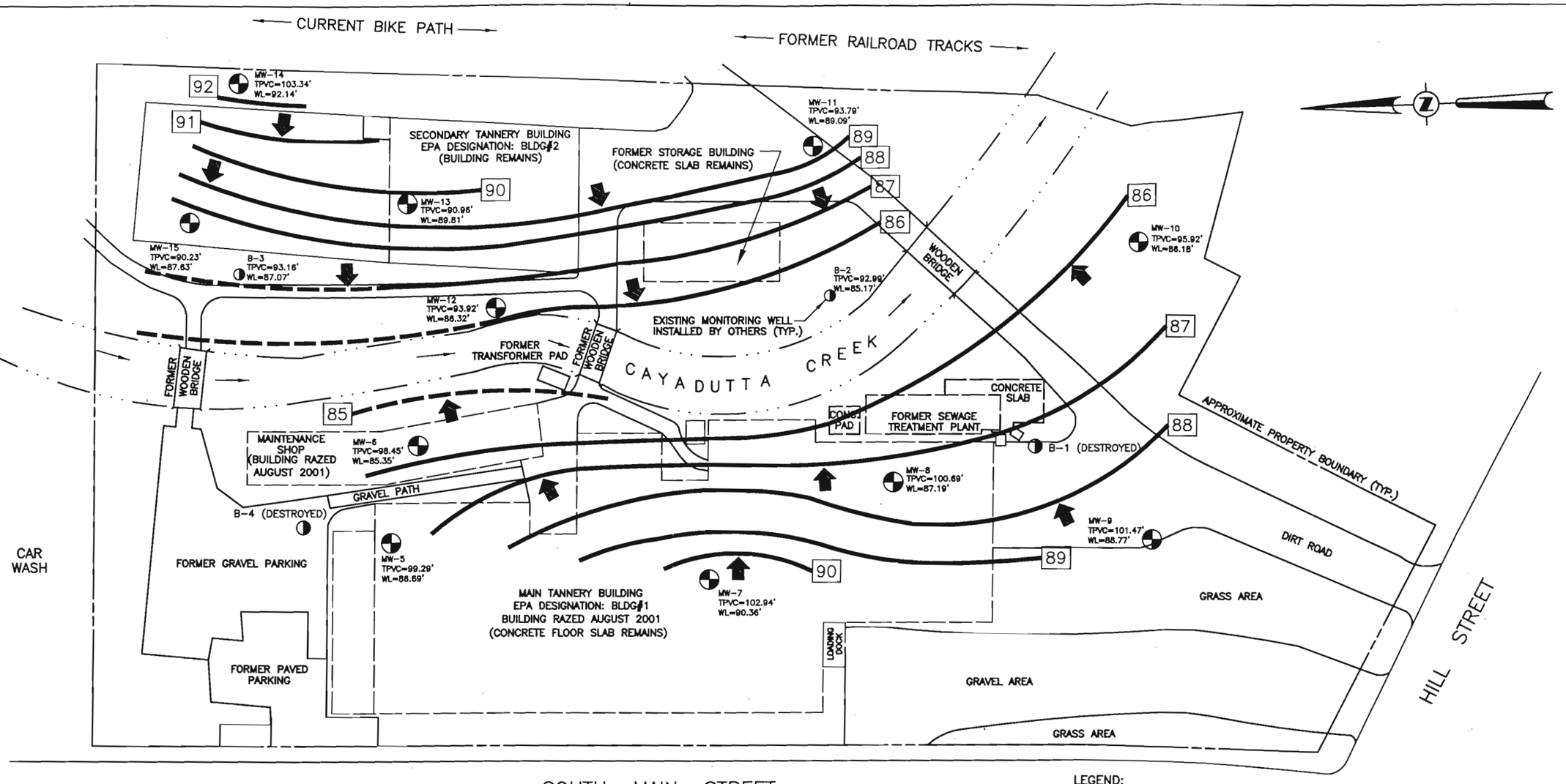
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.

FIGURE 10

GROUNDWATER CONTOUR MAP FOR MAY 30, 2002

NO XREFS



LEGEND:

- B-1 — EXISTING MONITORING WELLS B-1 THROUGH B-4
- MW-5 — C.T. MALE TEST BORING & MONITORING WELL LOCATIONS
- 88 — GROUNDWATER CONTOUR LINE. DASHED WHERE INFERRED. ARROW DEPICTS DIRECTION OF GROUNDWATER FLOW BASED ON MAY 30, 2002 WATER LEVELS.

GENERAL NOTES:
1.) THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTED	CHECK	APPR.
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FIGURE 10
GROUNDWATER CONTOUR MAP FOR MAY 30, 2002

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

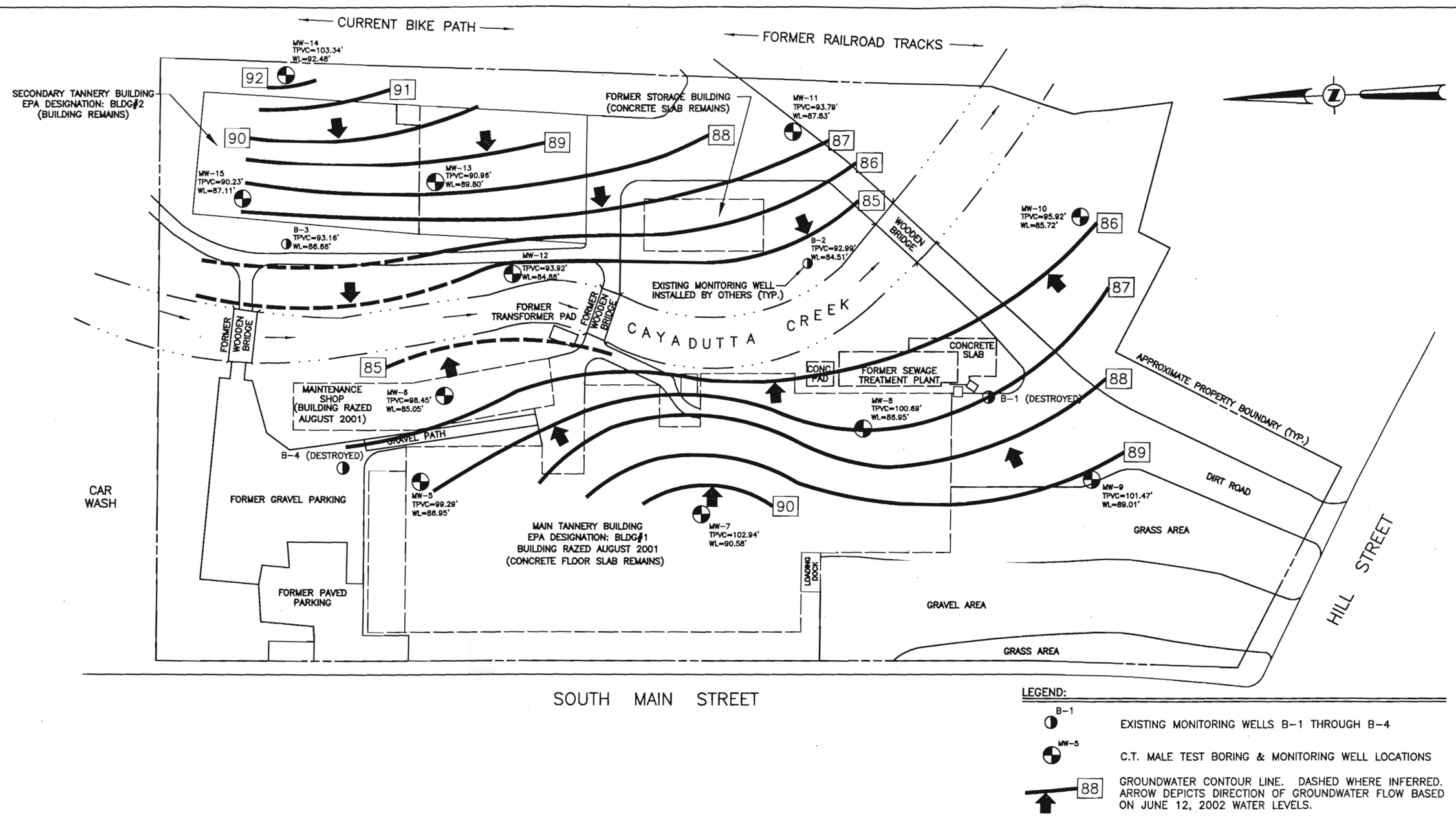
C.T. MALE ASSOCIATES, P.C.

FILE NAME: GW_CONT_053002.DWG

FIGURE 11

GROUNDWATER CONTOUR MAP FOR JUNE 12, 2002

NO XREFS



LEGEND:

- B-1 — EXISTING MONITORING WELLS B-1 THROUGH B-4
- MW-5 — C.T. MALE TEST BORING & MONITORING WELL LOCATIONS
- 88 — GROUNDWATER CONTOUR LINE. DASHED WHERE INFERRED. ARROW DEPICTS DIRECTION OF GROUNDWATER FLOW BASED ON JUNE 12, 2002 WATER LEVELS.

GENERAL NOTES:
1.) THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPOXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

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FIGURE 11
GROUNDWATER CONTOUR MAP FOR JUNE 12, 2002

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

GW_CONT_061202.DWG

APPENDIX A

METES AND BOUNDS DESCRIPTION

DESCRIPTION
LANDS OF THE CITY OF GLOVERSVILLE
FORMER INDEPENDENT LEATHER MANUFACTURING CORPORATION
CITY OF GLOVERSVILLE, FULTON COUNTY, NEW YORK
AREA = 3.725± ACRES

All that certain tract, piece or parcel of land situate in the City of Gloversville, Fulton County, New York, lying Easterly of South Main Street and Northeasterly of Hill Street, and being more particularly bounded and described as follows:

BEGINNING at the point of intersection of the Northeasterly boundary of Hill Street with the Easterly boundary of South Main Street and runs from said point of beginning along said Easterly boundary the following two (2) courses: 1) North 06 deg. 53 min. 09 sec. East 103.23 feet to a point; and 2) North 05 deg. 01 min. 15 sec. East 450.00 feet to its point of intersection with the division line between the lands now or formerly of the City of Gloversville as described in Book 830 of Deeds at Page 227 on the South and lands now or formerly of Mark Kilmer as described in Book 796 of Deeds at Page 6 on the North; thence along said division line South 84 deg. 58 min. 45 sec. East 307.00 feet to its point of intersection with the division line between the lands of said City of Gloversville on the West and other lands now or formerly of the City of Gloversville as described in Book 696 of Deeds at Page 149 on the East; thence along said division line South 06 deg. 35 min. 23 sec. West 425.00 feet to its point of intersection with the division line between the lands of said City of Gloversville as described in Book 830 of Deeds at Page 227 on the Northwest and lands of said City of Gloversville as described in Book 696 of Deeds at Page 149 on the Southeast; thence along said division line South 23 deg. 50 min. 57 sec. West 44.20 feet to its point of intersection with the division line between the lands of said City of Gloversville as described in Book 830 of Deeds at Page

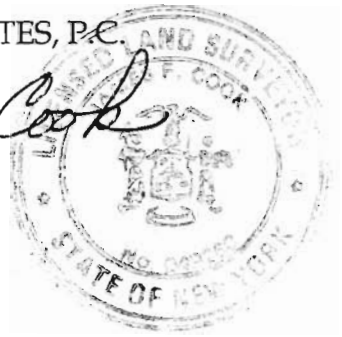
227 on the West and lands of said City of Gloversville as described in Book 696 of Deeds at Page 149 on the East; thence along said division line South 01 deg. 21 min. 02 sec. East 51.00 feet to its point of intersection with the division line between the lands of said City of Gloversville as described in Book 830 of Deeds at Page 227 on the North and lands now or formerly of Kenneth Carden as described in Book 762 of Deeds at Page 276 on the South; thence along said division line North 77 deg. 37 min. 13 sec. West 66.49 feet to its point of intersection with the division line between the lands of said City of Gloversville on the Northwest and lands of said Carden on the Southeast; thence along said division line South 33 deg. 58 min. 39 sec. West 18.00 feet to its point of intersection with the division line between the lands of said City of Gloversville on the Northeast and lands now or formerly of Mark Vrooman on the Southwest; thence along said division line North 54 deg. 31 min. 21 sec. West 60.00 feet to its point of intersection with the division line between the lands of said City of Gloversville on the Northwest and lands of said Vrooman on the Southeast; thence along said division line South 33 deg. 58 min. 40 sec. West 130.00 feet to its intersection with the above first mentioned Northeasterly boundary of Hill Street; thence along said Northeasterly boundary North 56 deg. 28 min. 01 sec. West 114.71 feet to the point or place of beginning, containing 3.725± acres.

Subject to any covenants, easements or restrictions of record.

C.T. MALE ASSOCIATES, P.C.

James F. Cook

James F. Cook, PLS



September 17, 2002
JFC/cc/jfc
C.T. Male Project No. 01.7293

Note: The above described parcel is shown in its entirety on a map entitled "Boundary Survey Former Independent Leather Manufacturing Corporation 321 South Main Street," City of Gloversville, County of Fulton, New York, prepared by C.T. Male Associates, P.C., dated January 29, 2002, Drawing No. 02.446.

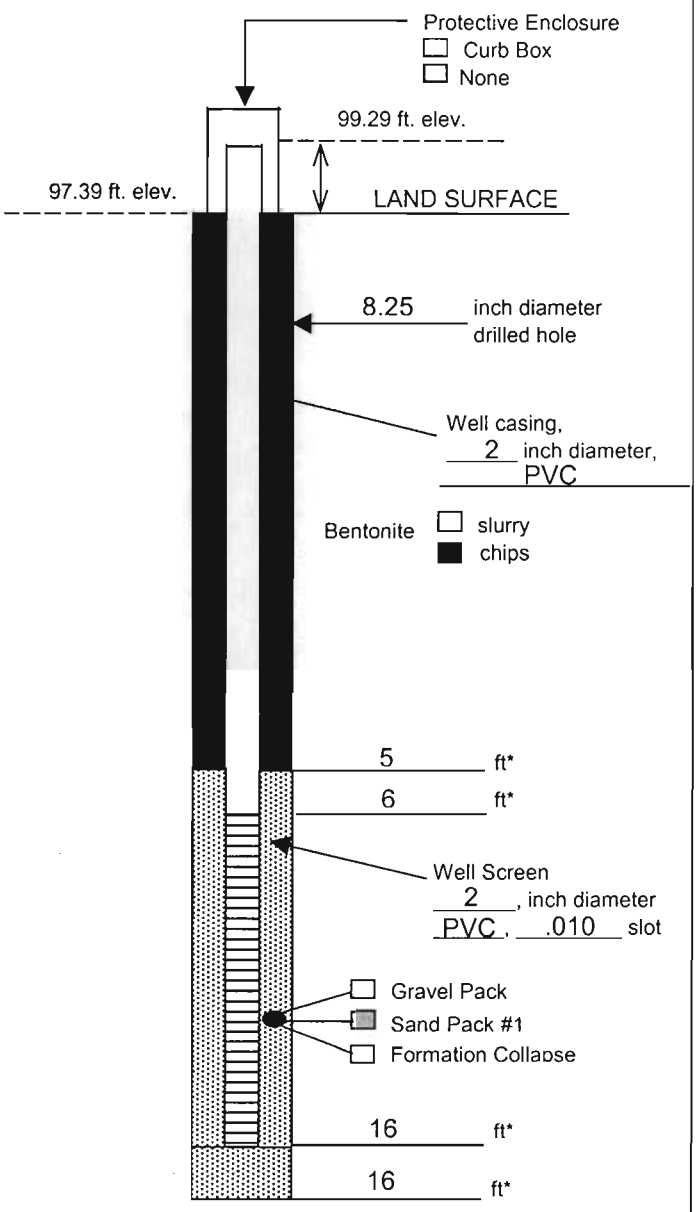
APPENDIX B

MONITORING WELL CONSTRUCTION DIAGRAMS

Well No. MW-5

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-5 Boring No. MW-5

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/23/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 12.60 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

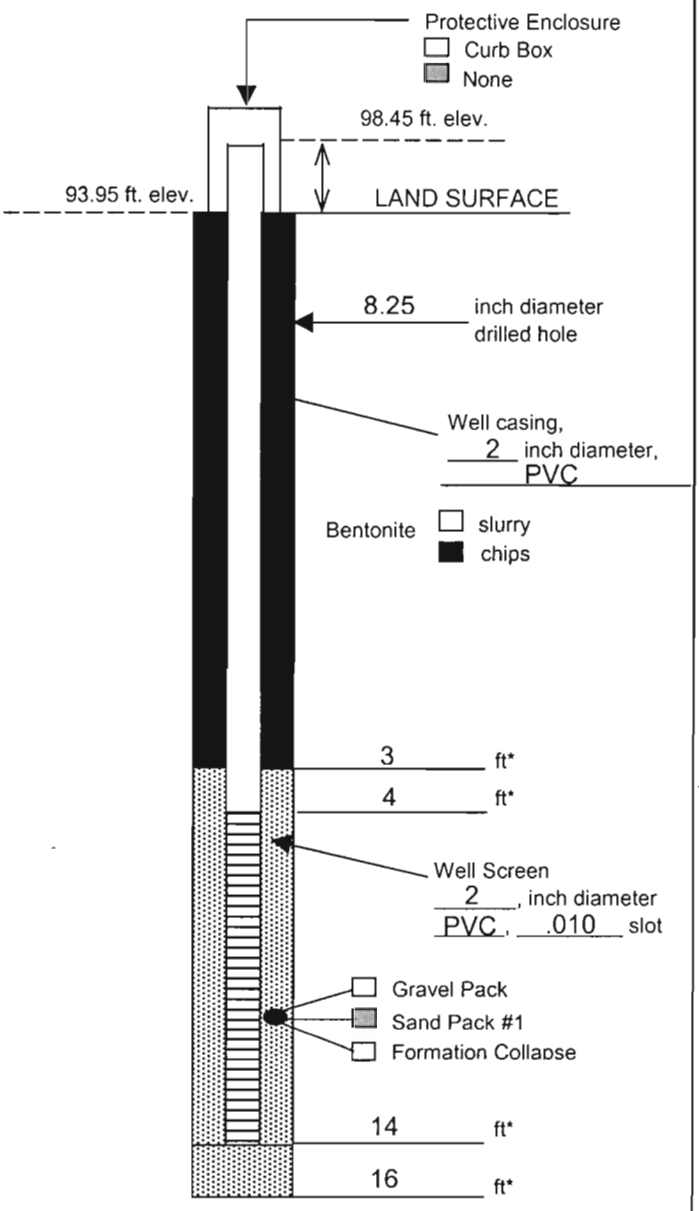
Notes:

Additional Water Depths:
12.60 ft on 5/30/02
12.34 ft on 6/12/02

Well No. MW-6

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-6 Boring No. MW-6

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/24/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 12.02 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

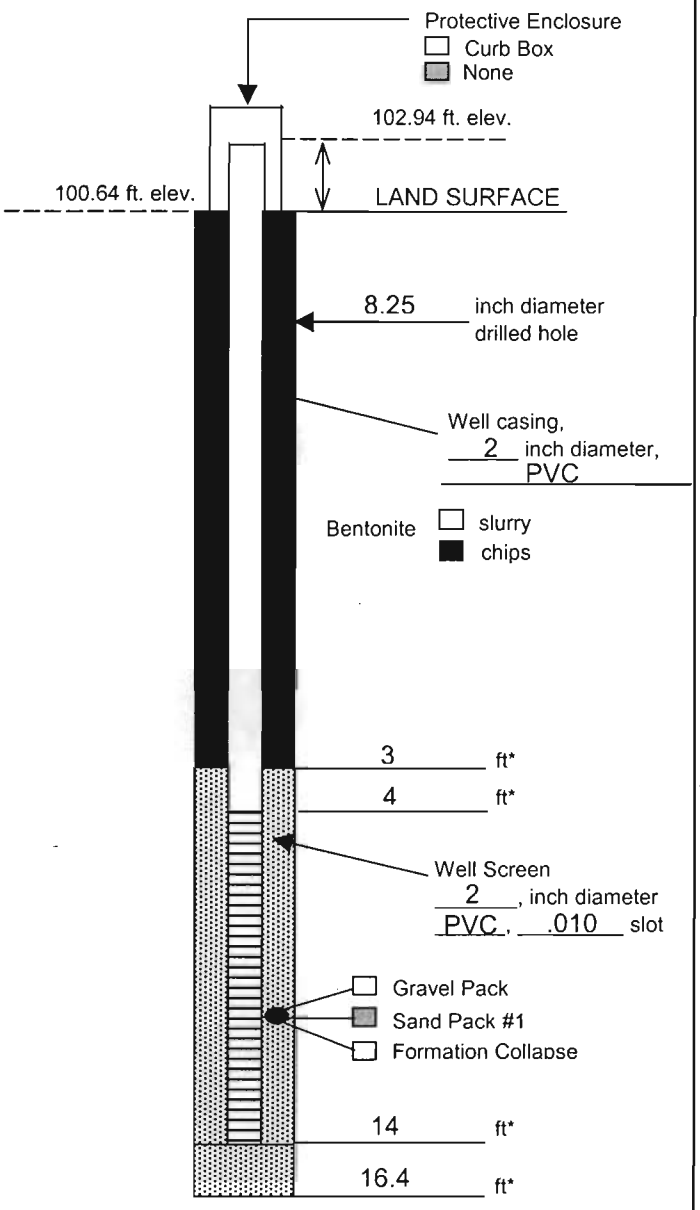
Notes:

Additional Water Depths:
13.10 ft on 5/30/02
13.40 ft on 6/12/02

Well No. MW-7

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-7 Boring No. MW-7

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/23/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 12.15 ft 4/30/02 (Date)

C.T. Male Observer Present J. Cross

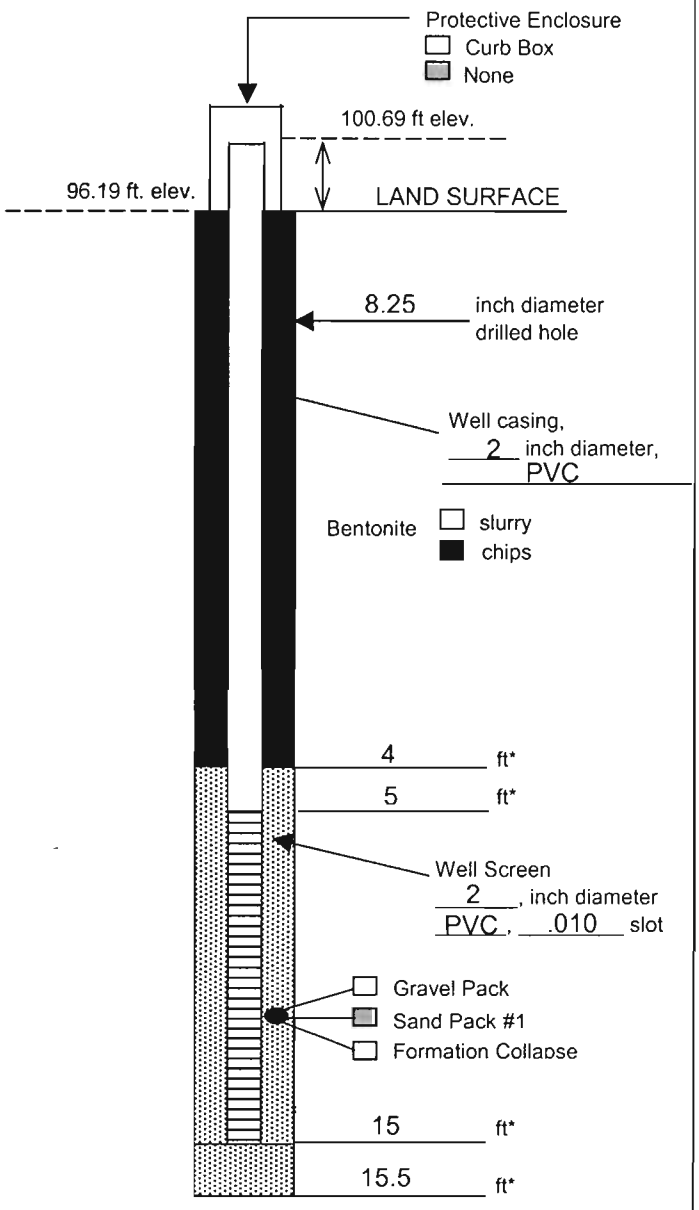
Notes:

Additional Water Depths:
12.58 ft on 5/30/02
12.36 ft on 6/12/02

Well No. MW-8

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-8 Boring No. MW-8

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/23/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 12.65 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

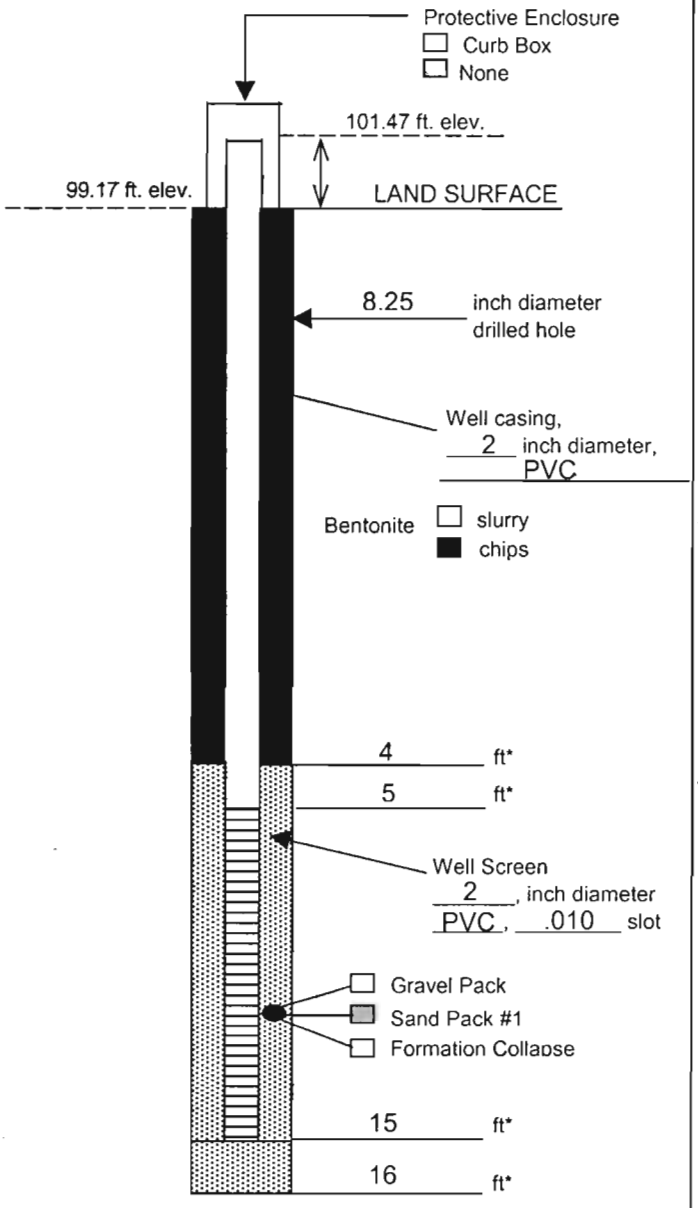
Notes:

Additional Water Depths:
13.50 ft on 5/30/02
13.74 ft on 6/12/02

Well No. MW-9

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-9 Boring No. MW-9

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/22/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 13.06 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

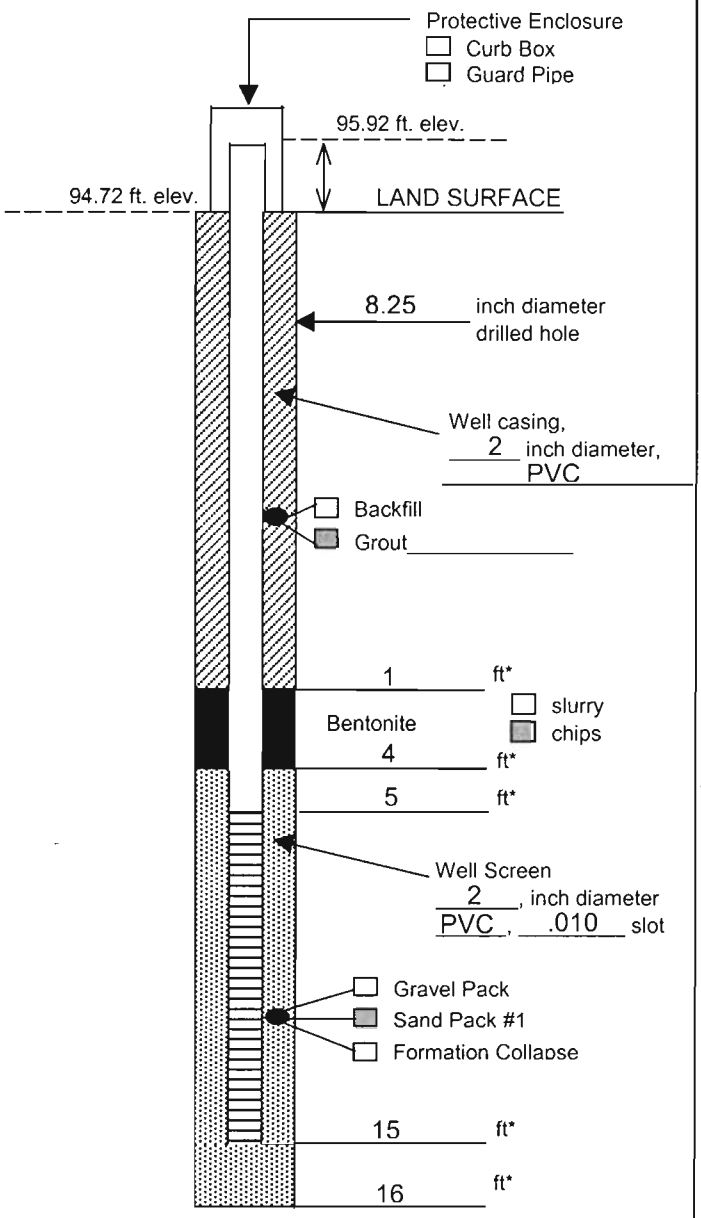
Notes:

Additional Water Depths:
12.70 ft on 5/30/02
12.46 ft on 6/12/02

Well No. MW-10

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-10 Boring No. MW-10

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/25/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 9.42 ft 4/30/02 (Date)

C.T. Male Observer Present J. Cross

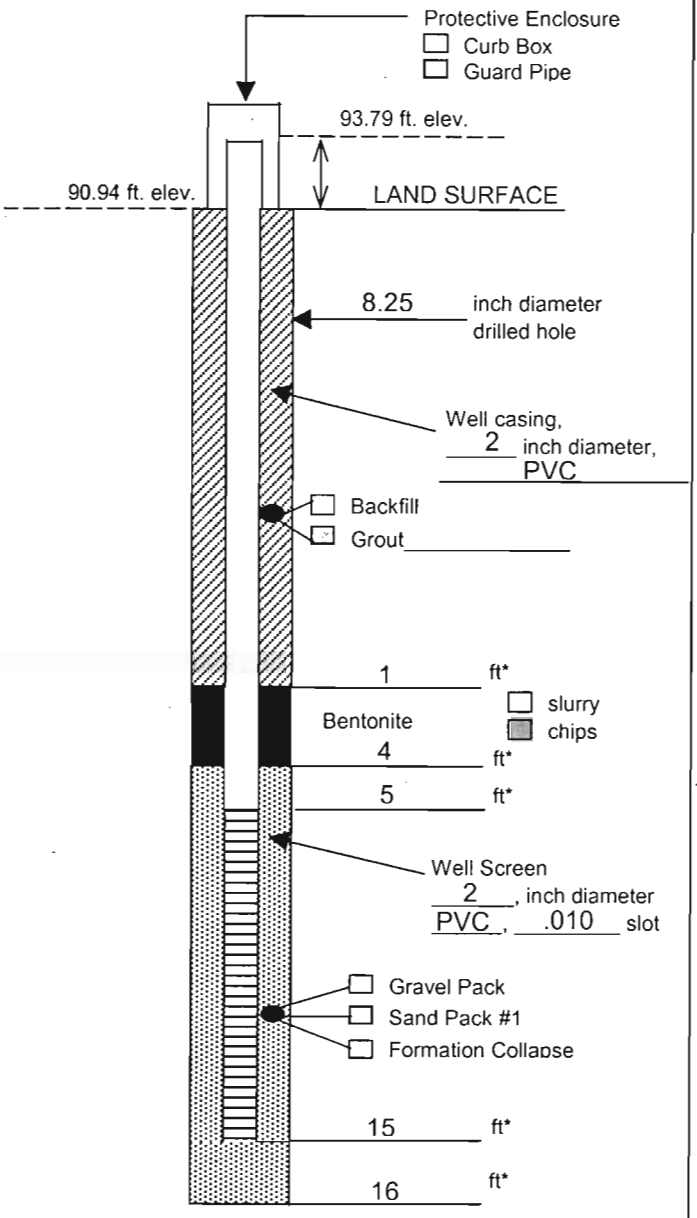
Notes:

Additional Water Depths:
9.74 ft on 5/30/02
10.20 ft on 6/12/02

Well No. MW-11

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-11 Boring No. MW-11

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/25/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 4.15 ft 4/30/02 (Date)

C.T. Male Observer Present J. Cross

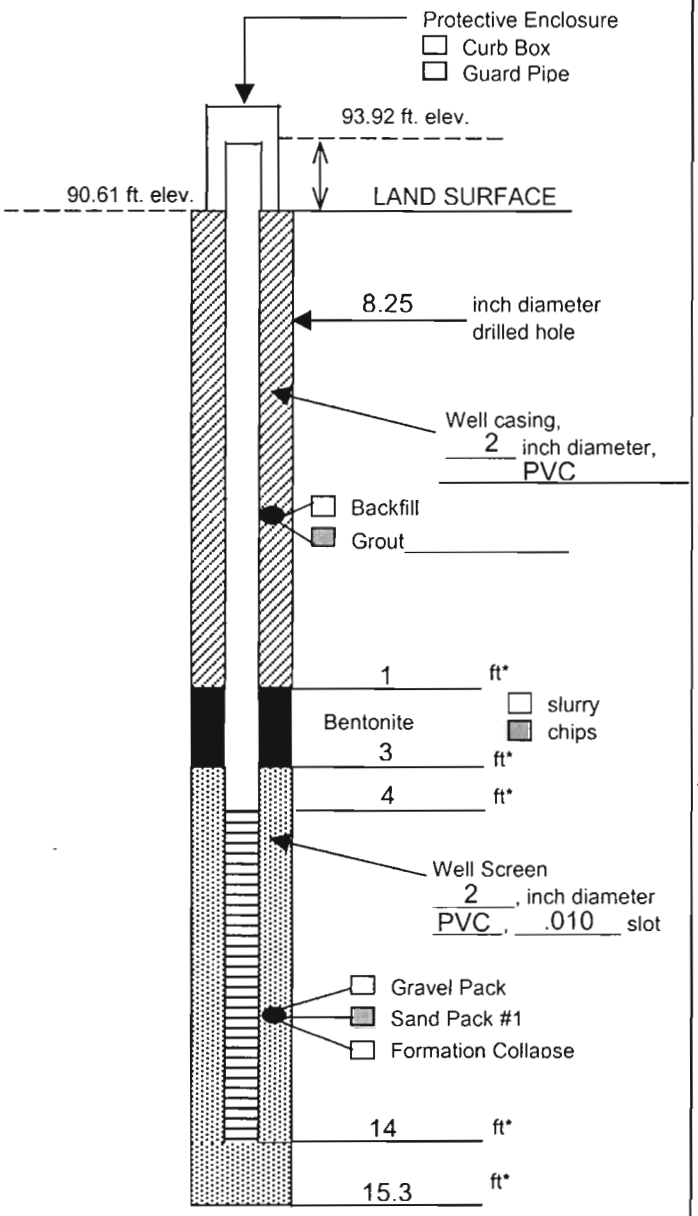
Notes:

Additional Water Depths:
4.70 ft on 5/30/02
5.96 ft on 6/12/02

Well No. MW-12

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-12 Boring No. MW-12

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/24/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 7.42 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

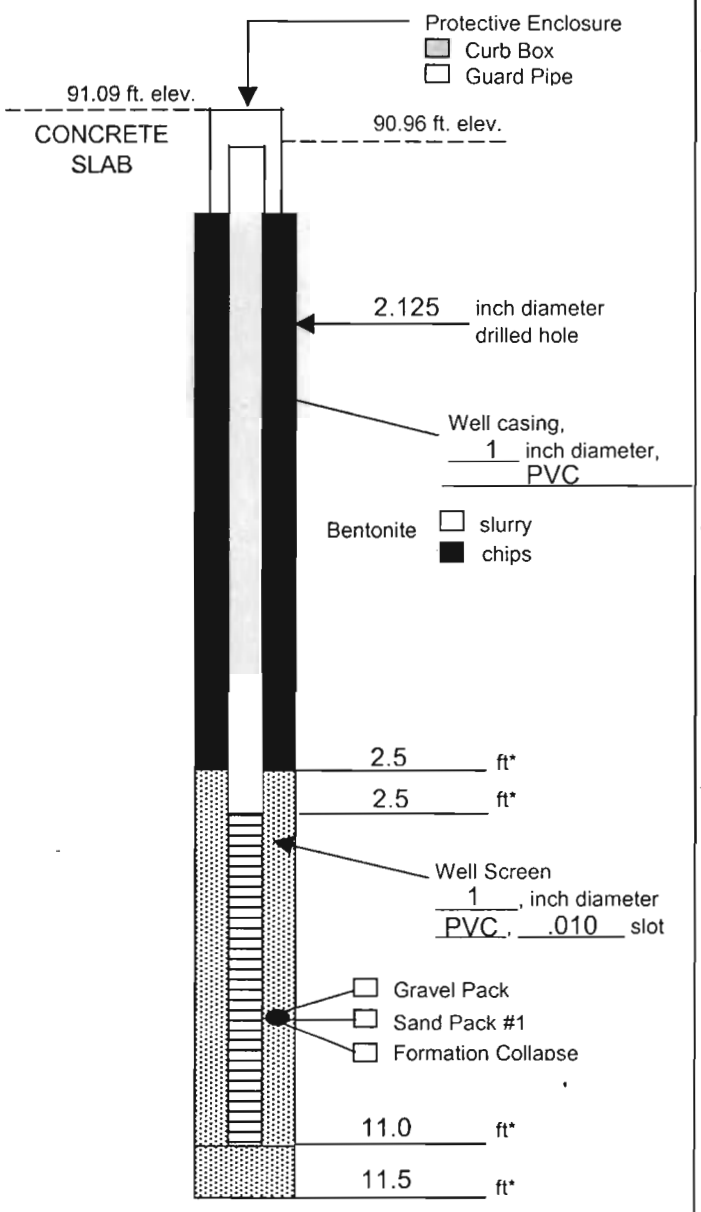
Notes:

Additional Water Depths:
7.60 ft on 5/30/02
9.06 ft on 6/12/02

Well No. MW-13

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-13 Boring No. MW-13

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/25/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method Macro-Core Sampler

Water Depth From Top of Riser 1.10 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

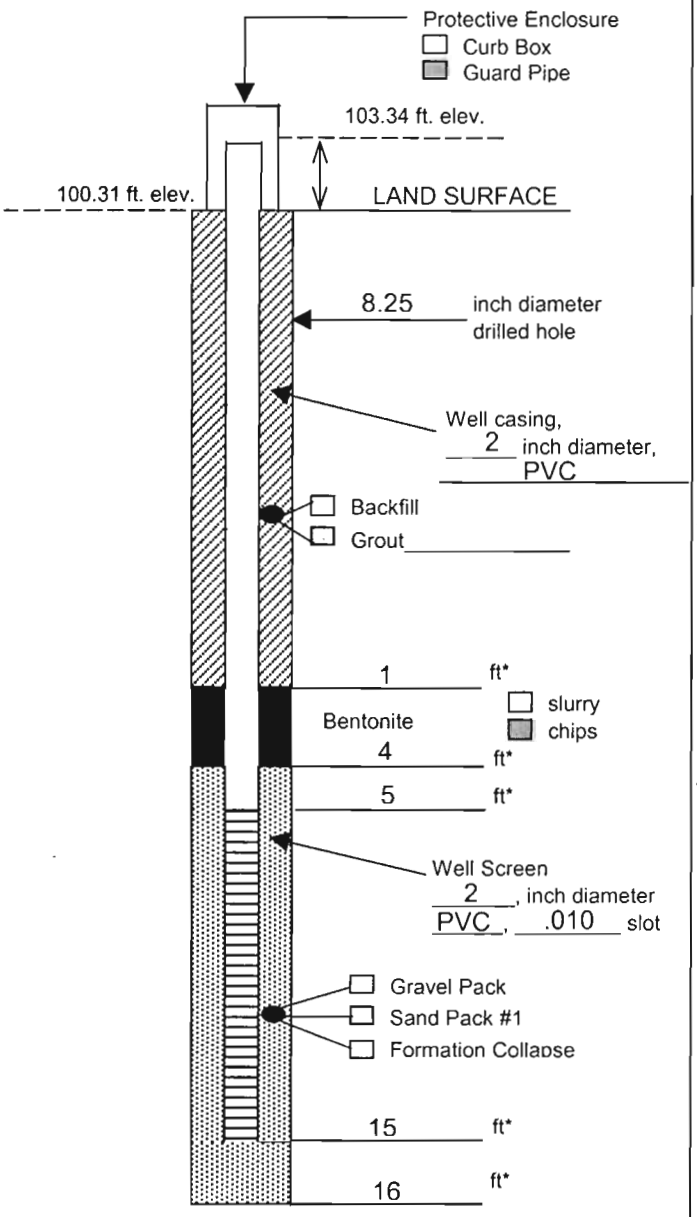
Notes:

Additional Water Depths:
1.15 ft on 5/30/02
1.16 ft on 6/12/02

Well No. MW-14

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-14 Boring No. MW-14

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/24/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method 4.25 inch Diameter Hollow Stem Auger

Water Depth From Top of Riser 10.74 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

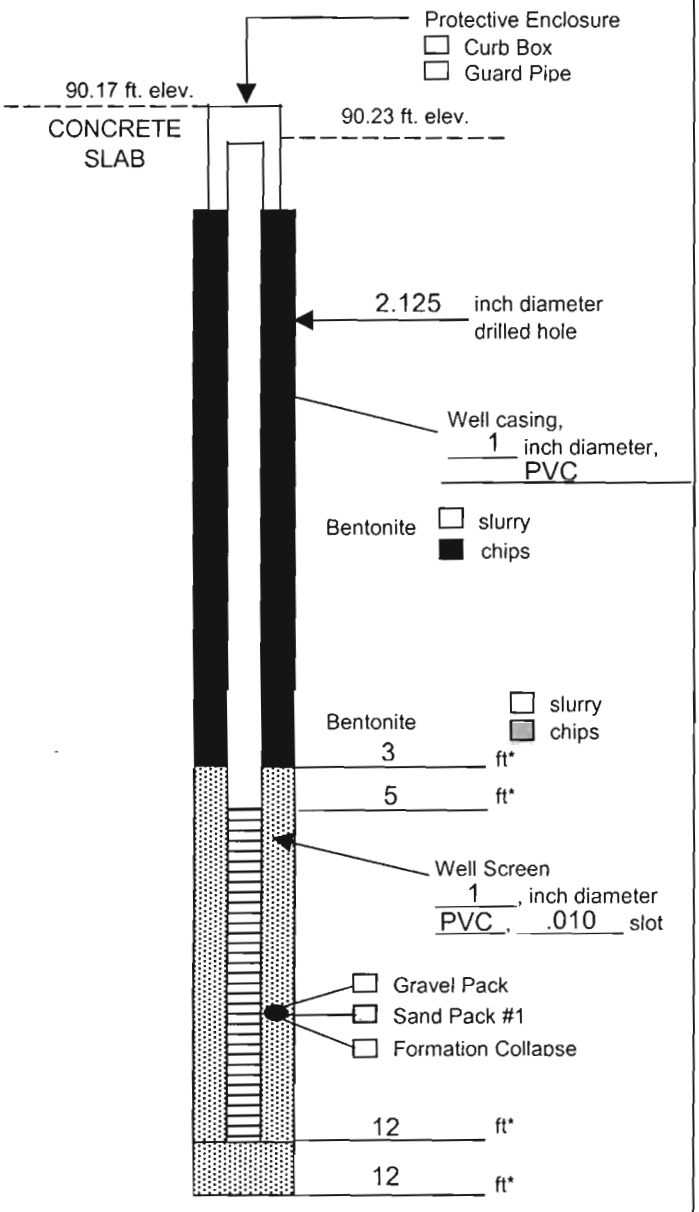
Notes:

Additional Water Depths:
11.20 ft on 5/30/02
10.86 ft on 6/12/02

Well No. MW-15

MONITOR WELL CONSTRUCTION LOG

C.T. MALE ASSOCIATES, P.C.



* Depth below land surface.

Project Number 01.7293

Project Name Independent Leather Tannery

Well No. MW-15 Boring No. MW-15

Town/City City of Gloversville

County Fulton State New York

Installation Date(s) 4/25/02

Drilling Contractor Environmental Drilling NY, Inc.

Drilling Method Macro-Core Sampler

Water Depth From Top of Riser 2.35 ft 4/30/02 Date

C.T. Male Observer Present J. Cross

Notes:

Additional Water Depths:
2.60 ft on 5/30/02
3.12 ft on 6/12/02

APPENDIX C

SUBSURFACE EXPLORATION BORING LOGS

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-5
ELEV.: 97.39' **DATUM: Assumed**
START DATE: 4/23/02 **FINISH DATE: 4/23/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	3	7	3	6	10	0.6	CONCRETE FILL: Dk Brown f to c SAND, little silt, trace f gravel (Damp, Loose)	Cut with auger cutting head.
		S-2	3	4	4	3	8	1.5		
5		S-3	4	7	7	5	14	0.4	Becomes Dk Brown f SAND, Some Silt, trace gravel (Moist, Firm)	
		S-4	4	4	4	4	8	1.7	Becomes Brown f SAND, Some Silt	Wood noted at 6'
10		S-5	3	4	5	3	9	1.2	Brown to black f SAND, Some Silt (Moist to Wet, Loose)	Wood noted at 9' ±
		S-6	2	1	1	2	2	1.2		Wood noted
		S-7	10	12	20	15	32	1.5	13' TILL: Gray SILT, Some embedded f to c Sand, trace gravel (Moist, Compact)	
15		S-8	20	17	17	23	34	1.3		
									Boring Terminated at 16'	
20									Installed a 2" diameter PVC monitoring well at a depth of 16'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-6
ELEV.: 93.95' **DATUM: Assumed**
START DATE: 4/24/02 **FINISH DATE: 4/24/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	1	3	7	3	10	0.8	FILL: Brown f SAND, Some Silt, trace gravel (Damp, Loose)	
		S-2	3	3	3	3	6	1.5	Becomes Brown f SAND, Some to little Silt (Moist, Loose)	
5		S-3	1	1	1	1	2	1.2	At 4' Becomes Yellow-Brown f SAND, Some Silt (Moist, Loose)	
		S-4	3	1	1	3	2	1.6	At 8' Becomes Brown f SAND, Some Silt (Wet at 6.5' ±) 8'	
10		S-5	7	21	27	12	48	0.9	TILL: Brown f to c SAND and GRAVEL, little silt (Wet, Compact) 11.5'	
		S-6	40	72	23	21	95	0.8	TILL: Gray SILT, Some embedded f to c Sand, trace to little gravel (Moist, Very Compact)	
		S-7	31	34	51	62	85	0.7		
15		S-8	23	30	35	40	65	1.7		
20									Boring Terminated at 16'	
									Installed a 2" diameter PVC monitoring well at a depth of 14'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-7
ELEV.: 100.64' **DATUM: Assumed**
START DATE: 4/23/02 **FINISH DATE: 4/23/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	15	18	11	9	29	0.9	FILL: Dk Brown f to c SAND, Some Gravel, little silt (Damp, Firm)	Brick, ash, cinders noted
		S-2	10	9	9	10	18	1.4	Becomes Orange-brown f SAND, little Silt	
5		S-3	8	8	6	6	14	0.0	S-3 No Recovery, concrete & brick in shoe	
		S-4	3	1	2	3	3	0.3	Brown f to c SAND, Some Silt, little gravel (Wet, Firm to Loose)	Brick noted
		S-5	1	1	4	16	5	0.9	9.5' TILL: Lt Brown SILT, Some embedded f to c Sand, trace gravel (Moist, Loose to Very Compact)	
10		S-6	7	10	18	31	28	0.9		
		S-7	36	38	100/0.4	-	-	0.0	S-7 No Recovery	
15		S-8	21	42	100/0.4	-	-	1.2	Becomes Brown	
20									Boring Terminated at 15.4' (Refusal) Installed a 2" diameter PVC monitoring well at a depth of 14'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-8
ELEV.: 96.19 **DATUM: Assumed**
START DATE: 4/23/02 **FINISH DATE: 4/23/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	-	4	4	2	8	0.8	5" CONCRETE FILL: Brown-black f to c SAND, little silt, trace gravel (Damp, Loose)	Cut with auger cutting head. Ash cinders noted
		S-2	2	2	2	1	4	0.8	4'	
5		S-3	1	1	2	4	3	1.6	Brown f to m SAND, little silt, trace f gravel (Damp, Loose)	
		S-4	2	1	4	7	5	2.0	At 6' Becomes Brown f SAND, Some Silt (Moist, Loose)	
		S-5	5	6	3	2	9	1.7		
10		S-6	1	2	7	6	9	0.7	At 9.5' Becomes Brown f to c SAND, little silt, trace gravel (Wet, Loose) Gray f to c SAND, Some Silt, little gravel (Wet) 12'	
		S-7	29	45	100/.5	-	-	1.3	TILL: Dark gray f to m SAND, little silt, trace gravel (Moist, Very Compact)	
15		S-8	3	9	100/.5	-	-	0.7		
									Boring Terminated at 15.5' (Refusal) Installed a 2" diameter PVC monitoring well at a depth of 15'. See Monitor Well Construction Log for details.	
20										
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-9
ELEV.: 99.17 **DATUM: Assumed**
START DATE: 4/22/02 **FINISH DATE: 4/22/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	6	8	10	7	18	0.7	Brown f to c SAND, little silt, trace f gravel (Damp, Firm)	Concrete in shoe piece of sampler. Orange staining noted
		S-2	5	6	6	6	12	1.1	Lt Brown f SAND, trace to little silt trace gravel (Damp, Firm)	
5		S-3	5	9	4	3	13	1.3	At 5' Becomes Brown f sand, trace to little silt (Damp, Firm to Loose)	Tan layers of SILT, Some v.f. Sand
		S-4	4	5	4	4	9	1.7	(Wet at 8')	
		S-5	6	9	8	6	17	1.5	9.5' Brown SILT, trace v.f. sand (Wet, Firm) 10'	
10		S-6	3	3	4	6	7	2.0	Brown f to c SAND, trace silt (Moist, Firm)	
		S-7	6	10	24	30	34	2.0	POSSIBLE TILL: At 12' Becomes Brown f to m SAND, little silt (Wet, Compact)	1' Layers of Brown to Lt Brown SILT, trace f to c sand (Wet) noted at 11' and 13'
15		S-8	20	23	40	46	63	0.4		
									Boring Terminated at 16'	
20									Installed a 2" diameter PVC monitoring well at a depth of 15'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-10
ELEV.: 94.72 **DATUM: Assumed**
START DATE: 4/25/02 **FINISH DATE: 4/25/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	6	5	5	4	10	0.8	FILL: Dk brown SILT and f SAND (Damp to Moist, Loose)	
		S-2	7	10	13	9	23	1.7	Becomes Dk brown SILT and f SAND, little gravel	
5		S-3	2	2	2	2	4	1.4	At 5' Becomes Olive-Brown SILT and f SAND, trace gravel (Moist, Loose)	Brick noted
		S-4	2	2	3	3	5	0.3	8'	Petroleum-type odor Possible Slough
10		S-5	1	1	2	2	3	0.8	Possible FILL: Black f to c SAND and GRAVEL, little silt (Wet, Loose to Firm)	
		S-6	4	4	10	11	14	1.0		
		S-7	15	8	13	13	21	1.8	14'	
15		S-8	13	19	37	52	56	1.3	POSS. TILL: Brown/gray f - c SAND, Some Silt, little embedded gravel (Wet, Very Compact)	
									Boring Terminated at 16'	
20									Installed a 2" diameter PVC monitoring well at a depth of 15'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-11
ELEV.: 90.94 **DATUM: Assumed**
START DATE: 4/25/02 **FINISH DATE: 4/25/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	6	7	10	7	17	1.3	FILL: Brown to dk brown f to m SAND (Damp, Firm to Loose)	
		S-2	8	6	5	8	11	0.7	Becomes Dk brown to black f to m SAND, Some Silt, trace gravel (Damp to Moist)	
5		S-3	1	1	2	2	3	0.2	At 5' Becomes Brown f SAND, little silt 6'	
		S-4	2	2	2	2	4	1.8	Olive-Brown SILT, Some f Sand (Wet, Loose) Grades to Brown f SAND, Some Silt	Roots noted at 7.5' ±
10		S-5	1	1	2	2	3	1.9	Becomes Lt Gray	
		S-6	2	2	5	7	7	0.7	Becomes Yellow-Brown f to c SAND, little silt, trace gravel 12'	
		S-7	42	47	39	40	86	2.0	TILL: Brown f to m SAND, little silt & embedded gravel (Wet, Very Compact)	
15		S-8	24	25	27	50	52	1.4	At 15' Becomes Lt brown f SAND, little silt, trace embedded f gravel (Wet, Very Compact)	
									Boring Terminated at 16'	
20									Installed a 2" diameter PVC monitoring well at a depth of 15'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-12
ELEV.: 90.61 **DATUM: Assumed**
START DATE: 4/24/02 **FINISH DATE: 4/24/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	6	6	6	5	12	0.9	FILL: Brown & black f to m SAND, little silt, trace gravel (Damp, Firm to Loose)	Piece of coal noted in S-2
		S-2	1	1	1	1	2	1.5	Becomes brown f SAND, Some to little Silt	S-3 initial recovery of 0.1', repounded spoon to obtain sample
5		S-3	2	1	2	1	3	0.6	At 5' Becomes Rust brown to olive f SAND, Some Silt (Damp to Wet, Loose) 6'	
		S-4	4	13	8	10	21	0.4	Olive-Brown f SAND and SILT, little gravel (Wet, Firm) 9'	Wet at 5.5' ±
		S-5	13	18	43	49	61	1.6		Roots noted
10		S-6	21	28	41	60	69	0.7	TILL: Gray-brown SILT, Some embedded f to c Sand, little gravel (Moist, Very Compact) Becomes Gray	
		S-7	67	100/.4	-	-	-	0.3		
15		S-8	47	107	100/.3	-	-	1.0		
20									Boring Terminated at 15.3' (Refusal) Installed a 2" diameter PVC monitoring well at a depth of 14'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

GEOPROBE SUBSURFACE EXPLORATION LOG

BORING NO.: MW-13
ELEV.: 91.09 **DATUM: Assumed**
START DATE: 4/25/02 **FINISH DATE: 4/25/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE INTERVAL	SAMPLE NO.	SAMPLE RECOVERY (FT)	SAMPLE CLASSIFICATION	NOTES
		S-1	2.4	0.3' ± CONCRETE	A hole cut in concrete for curbox with starbit.
				FILL: Brown/gray SILT, Some f-c Sand&Gravel (Damp to Moist)	
				At 2' Becomes Brown SILT, trace v.f. sand	Sweet petroleum-like odor
4				At 3' Becomes Olive SILT, trace v.f. sand 4'	Brick noted
		S-2	3.2	Olive-Brown f SAND, Some Silt, trace gravel (Wet)	Wet at 4' ±
				Becomes Some Gravel	
8				At 7.5' ± Becomes Gray f to c SAND, little silt & embedded gravel (Moist)	
		S-3	3.5		
12					
				Boring Terminated at 11.5' (Refusal)	
				Installed a 1" diameter PVC monitoring well at a depth of 11'. See Monitor Well Construction Log for details.	
16					
20					
24					
28					

DRILLING CONTRACTOR: Env. Drilling NY, Inc. GEOPROBE TYPE: Track 54DT
METHOD OF SAMPLING: Direct Push w/ Percussion Hammer with 2" x 4' Macrocore

GROUNDWATER LEVEL READINGS

DATE	LEVEL	REFERENCE MEASURING POINT

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

SUBSURFACE EXPLORATION LOG

BORING NO.: MW-14
ELEV.: 100.31 **DATUM: Assumed**
START DATE: 4/24/02 **FINISH DATE: 4/24/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE TYPE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	RECOVERY	SAMPLE CLASSIFICATION	NOTES
		S-1	3	3	5	5	8	1.2	Brown & black f to m SAND, little silt, trace gravel (Damp, Loose to Firm)	
		S-2	5	5	6	5	11	1.3	Becomes Orange-Brown f SAND, little silt	
5		S-3	7	11	13	16	24	1.3	At 5' Becomes Brown f SAND, little silt & gravel	
		S-4	18	21	20	32	41	1.3	At 7.7' ± Becomes Brown f SAND, little silt (Moist, Compact)	
10		S-5	16	20	23	25	43	1.5	10'	
		S-6	19	21	27	23	48	1.4	TILL: Brown f SAND, little silt, little embedded gravel (Moist, Compact to Very Compact)	
		S-7	40	42	69	83	111	1.0		
15		S-8	21	23	24	27	47	1.6		
20									Boring Terminated at 16' Installed a 2" diameter PVC monitoring well at a depth of 15'. See Monitor Well Construction Log for details.	
25										
30										

N = NO. OF BLOWS TO DRIVE 2" SAMPLER 12" WITH A 140 LB. WT. FALLING 30" PER BLOW

DRILLING CONTRACTOR: Env. Drilling NY, Inc. DRILL RIG TYPE: Truck Mounted CME-55

METHOD OF INVESTIGATION: 4.25" Hollow Stem Augers with 2" x 2' Split Spoon

GROUNDWATER LEVEL READINGS

DATE	LEVEL	CASING	STABILIZATION TIME

SAMPLE CLASSIFICATION BY: J. Cross

C.T. MALE ASSOCIATES, P.C.

GEOPROBE SUBSURFACE EXPLORATION LOG

BORING NO.: MW-15
ELEV.: 90.17 **DATUM: Assumed**
START DATE: 4/25/02 **FINISH DATE: 4/25/02**
SHEET 1 OF 1

PROJECT: Independent Leather Tannery CTM PROJECT NO.: 01.7293

LOCATION: 321-333 South Main Street, Gloversville, NY CTM OBSERVER: J. Cross

DEPTH (FT.)	SAMPLE INTERVAL	SAMPLE NO.	RECOVERY (FT)	SAMPLE CLASSIFICATION	NOTES
		S-1	1.6	0.2' ± CONCRETE	Concrete broken with starbit.
				POS FILL: Brown f to c SAND, Some Silt, little gravel (Wet)	
4				At 3.5' ± Becomes Black f to c SAND, Some Silt, little gravel	Sweet petroleum-like odor
				Becomes Brown f SAND, little silt (Moist)	
		S-2	2.7	At 5' ± Becomes Black f to c SAND, Some Gravel & Silt	
					Wood noted
					Sweet petroleum-like odor
8				Grades to Gray f to c SAND, little silt, trace gravel (Wet)	
		S-3	4.0		
				POSSIBLE TILL: Gray f to c SAND, little silt & embedded gravel (Wet)	
12					
				Boring Terminated at 12'	
				Installed a 1" diameter PVC monitoring well at a	
16				depth of 12'. See Monitor Well Construction Log for details.	
20					
24					
28					

DRILLING CONTRACTOR: Env. Drilling NY, Inc. GEOPROBE TYPE: Track 54DT
METHOD OF SAMPLING: Direct Push w/ Percussion Hammer with 2" x 4' Macrocore

GROUNDWATER LEVEL READINGS

DATE	LEVEL	REFERENCE MEASURING POINT

SAMPLE CLASSIFICATION BY: J. Cross

APPENDIX D

ORGANIC VAPOR HEADSPACE ANALYSIS LOGS

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 1 OF 1
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/22/02
INSTRUMENT USED: MiniRAE 2000	LAMP 10.6 eV	DATE
DATE INSTRUMENT CALIBRATED: 4/22/02	BY: J. Cross	ANALYZED: 4/22/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-9	S-1	0-2	Soil	0.0	0.0	No odor / No staining
	S-2	2-4	Soil	0.0	0.0	No odor / No staining
	S-3	4-6	Soil	0.0	0.0	No odor / No staining
	S-4	6-8	Soil	0.0	0.0	No odor / No staining
	S-5	8-10	Soil	0.1	0.0	No odor / No staining
	S-6	10-12	Soil	0.3	0.0	No odor / No staining
	S-7	12-14	Soil	0.0	0.0	No odor / No staining
	S-8	14-16	Soil	0.0	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 1 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/23/02
INSTRUMENT USED: MiniRAE 2000	LAMP 10.6 eV	DATE
DATE INSTRUMENT CALIBRATED: 4/23/02	BY: J. Cross	ANALYZED: 4/23/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-8	S-1	0.5-2	Soil	0.1	0.0	No odor / No staining
	S-2	2-4	Soil	0.1	0.0	No odor / No staining
	S-3	4-6	Soil	0.0	0.0	No odor / No staining
	S-4	6-8	Soil	0.1	0.0	No odor / No staining
	S-5	8-10	Soil	0.2	0.0	No odor / No staining
	S-6	10-12	Soil	0.2	0.0	No odor / No staining
	S-7	12-13.5	Soil	0.8	0.0	No odor / No staining
	S-8	14-15.5	Soil	0.1	0.0	No odor / No staining
MW-7	S-1	0-2	Soil	0.6	0.0	No odor / No staining
	S-2	2-4	Soil	0.2	0.0	No odor / No staining
	S-3	No recovery	Soil	-	-	No odor / No staining
	S-4	6-8	Soil	1.3	0.0	No odor / No staining
	S-5	8-10	Soil	0.8	0.0	No odor / No staining
	S-6	10-12	Soil	0.4	0.0	No odor / No staining
	S-7	No recovery	Soil	-	-	No odor / No staining
	S-8	15-16.4	Soil	0.7	0.0	No odor / No staining
MW-5	S-1	0-2	Soil	0.5	0.0	No odor / No staining
	S-2	2-4	Soil	0.2	0.0	No odor / No staining
	S-3	4-6	Soil	0.2	0.0	No odor / No staining
	S-4	6-8	Soil	0.0	0.0	No odor / No staining
	S-5	8-10	Soil	0.0	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 2 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/23/02
INSTRUMENT USED: MiniRAE 2000 LAMP 10.6 eV		DATE
DATE INSTRUMENT CALIBRATED: 4/23/02	BY: J. Cross	ANALYZED: 4/23/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-5	S-6	10-12	Soil	0.4	0.0	No odor / No staining
	S-7	12-14	Soil	3.3	0.0	No odor / No staining
	S-8	14-16	Soil	0.0	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 1 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/24/02
INSTRUMENT USED: MiniRAE 2000 LAMP 10.6 eV		DATE
DATE INSTRUMENT CALIBRATED: 4/24/02	BY: J. Cross	ANALYZED: 4/24/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-6	S-1	0-2	Soil	0.4	0.0	No odor / No staining
	S-2	2-4	Soil	0.4	0.0	No odor / No staining
	S-2	2-4 (extra)	Soil	0.2	0.0	No odor / No staining
	S-3	4-6	Soil	0.2	0.0	No odor / No staining
	S-4	6-8	Soil	0.3	0.0	No odor / No staining
	S-5	8-10	Soil	0.7	0.0	No odor / No staining
	S-6	10-12	Soil	0.5	0.0	No odor / No staining
	S-7	12-14	Soil	0.7	0.0	No odor / No staining
	S-8	14-16	Soil	0.7	0.0	No odor / No staining
MW-12	S-1	0-2	Soil	0.5	0.0	No odor / No staining
	S-2	2-4	Soil	343	0.0	Slight petroleum-like odor/ No Staining
	S-3	4-6	Soil	0.3	0.0	No odor / No staining
	S-4	6-8	Soil	2.2	0.3	No odor / No staining
	S-5	8-10	Soil	0.2	0.0	No odor / No staining
	S-6	10-12	Soil	10.1	0.0	No odor / No staining
	S-7	12-12.9	Soil	3.8	0.0	No odor / No staining
	S-8	14-15.3	Soil	1.3	0.0	No odor / No staining
MW-14	S-1	0-2	Soil	0.6	0.0	No odor / No staining
	S-2	2-4	Soil	0.7	0.0	No odor / No staining
	S-3	4-6	Soil	1.1	0.0	No odor / No staining
	S-4	6-8	Soil	0.4	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 2 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/24/02
INSTRUMENT USED: MiniRAE 2000	LAMP 10.6 eV	DATE
DATE INSTRUMENT CALIBRATED: 4/24/02	BY: J. Cross	ANALYZED: 4/24/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-14	S-5	8-10	Soil	0.0	0.0	No odor / No staining
	S-6	10-12	Soil	0.8	0.0	No odor / No staining
	S-7	12-14	Soil	0.9	0.0	No odor / No staining
	S-8	14-16	Soil	0.8	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 1 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/25/02
INSTRUMENT USED: MiniRAE 2000 LAMP 10.6 eV		DATE
DATE INSTRUMENT CALIBRATED: 4/25/02	BY: J. Cross	ANALYZED: 4/25/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-13	S-1	0-2	Soil	709	0.2	Sweet, solvent-type odor/Possible staining
	S-1	2-4	Soil	283	1.2	Slight petroleum-type odor/No staining
	S-2	4-6	Soil	185	1.2	No odor / No staining
	S-2	6-8	Soil	5.0	0.0	No odor / No staining
	S-3	8-10	Soil	0.3	0.0	No odor / No staining
	S-3	10-11.5	Soil	65	0.0	No odor / No staining
MW-11	S-1	0-2	Soil	0.6	0.0	No odor / No staining
	S-2	2-4	Soil	0.9	0.0	No odor / No staining
	S-3	4-6	Soil	1.0	0.0	No odor / No staining
	S-4	6-8	Soil	0.6	0.0	No odor / No staining
	S-5	8-10	Soil	0.3	0.0	No odor / No staining
	S-6	10-12	Soil	1.0	0.0	No odor / No staining
	S-7	12-14	Soil	0.4	0.0	No odor / No staining
	S-8	14-16	Soil	0.0	0.0	No odor / No staining
MW-10	S-1	0-2	Soil	1.1	0.0	No odor / No staining
	S-2	2-4	Soil	3.0	0.0	Petroleum-type odor/Black stain
	S-3	4-6	Soil	28.7	0.0	Petroleum-type odor/Black stain
	S-4	6-8	Soil	211	0.1	Petroleum-type odor/No staining
	S-5	8-10	Soil	9.0	0.0	No odor / No staining
	S-6	10-12	Soil	0.8	0.2	No odor / No staining
	S-7	12-14	Soil	0.3	0.0	No odor / No staining
	S-8	14-16	Soil	1.4	0.2	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

ORGANIC VAPOR HEADSPACE ANALYSIS LOG

PROJECT: Independent Leather Leather	PROJECT #: 01.7293	PAGE 2 OF 2
CLIENT: City of Gloversville		DATE
LOCATION: 321-333 South Main Street, Gloversville, New York		COLLECTED: 4/25/02
INSTRUMENT USED: MiniRAE 2000 LAMP 10.6 eV		DATE
DATE INSTRUMENT CALIBRATED: 4/25/02	BY: J. Cross	ANALYZED: 4/25/02
TEMPERATURE OF SOIL: Ambient		ANALYST: J. Cross

EXPLORATION NUMBER	SAMPLE NUMBER	DEPTH (FT.)***	SAMPLE TYPE	SAMPLE READING (PPM)**	BACKGROUND READING (PPM)**	REMARKS
MW-15	S-1	0-4	Soil	50.1	0.0	Sweet, organic-type odor/Black staining @ 3.5'
	S-2	4-6	Soil	112	0.0	Sweet, organic-type odor/Black staining
	S-3	6-8	Soil	331	0.0	Sweet, organic-type odor/Black staining
	S-4	8-10	Soil	97.5	0.0	No odor / No staining
	S-5	10-12	Soil	1.8	0.0	No odor / No staining

*Instrument was calibrated in accordance with manufacturer's recommended procedure using a calibration gas supplied by the manufacturer.
**PPM represents concentration of detectable volatile and gaseous compounds in parts per million of air.
***Due to poor sample recovery the sample is not sufficient enough to specify which portion of the recovered sample interval was collected .

APPENDIX E

GROUNDWATER SERVICES FIELD LOGS

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/6/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DelSole, Jeff Marx

MONITORING WELL ID#: MW-5 NOTES TAKEN BY: Deb DelSole

DEPTH TO WATER: 13.3 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 20.3 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.0 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.12 GALLONS

VOLUMES PURGED: 6 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 2:35 ; TIME FINISHED: 3:05

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 11.7

OTHER

WATER RECOVERY HEIGHT: 13.76 RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH ~~5.35~~ 7.41 (qw) TEMPERATURE ~~26.6~~ 11.5 (qw)

CONDUCTIVITY ~~1.03~~ 1111 µS (qw) UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 3:05

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL metals, Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DeLisle

MONITORING WELL ID#: MW-6 NOTES TAKEN BY: Deb DeLisle

DEPTH TO WATER: 12.85 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 20.3 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.45 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.192 GALLONS

VOLUMES PURGED: 4.25 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 2:52 ; TIME FINISHED: 3:17

OBSERVATIONS: COLOR Slightly cloudy to clear ODOR none

SHEEN none ; TURBIDITY 44.5 NTU

OTHER

WATER RECOVERY HEIGHT: 13.8 ; RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH 7.78 , TEMPERATURE 10.9°C

CONDUCTIVITY 521 µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 3:20

NOTES: Samples collected for TCL VOCs, TCL SVOCs, pesticides, PCB, TAL metals & Cyanide

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/6/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DelSole, Jeff Marx

MONITORING WELL ID#: MW-7 NOTES TAKEN BY: Deb DelSole

DEPTH TO WATER: 12.34 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 20.3 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.96 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.27 GALLONS

VOLUMES PURGED: GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 1:01 pm ; TIME FINISHED: 1:40 PM

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 10 during sampling

OTHER

WATER RECOVERY HEIGHT: 13.00' 91.7% Rec RECOVERY TIME IN MINUTES: 20

FIELD PARAMETERS: pH 6.53 , TEMPERATURE 12.1 °C

CONDUCTIVITY 16.88 mS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 2:00 PM

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals, Cyanide

7.3

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/6/12 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: D.b.D.c.l.S.L.

MONITORING WELL ID#: MW-8 NOTES TAKEN BY: D.b.D.c.l.S.L.

DEPTH TO WATER: 14.22 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 21.25 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.03 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

WELL CASING DIAMETER

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS 4" = 0.66 GALLONS

2" = 0.16 GALLONS 6" = 1.47 GALLONS

3" = 0.38 GALLONS 1" = 0.41 GALLONS

WELL VOLUME: 1.12 GALLONS

VOLUMES PURGED: 6 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 11:50 ; TIME FINISHED: 12:20

OBSERVATIONS: COLOR yellowish tan to clear ; ODOR none

SHEEN none ; TURBIDITY 23.5 NTU

OTHER

WATER RECOVERY HEIGHT: 14.13 ; RECOVERY TIME IN MINUTES: 85 min.

FIELD PARAMETERS: pH 7.03 , TEMPERATURE 13.2°C

CONDUCTIVITY 2.34 mS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 1:45 pm

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals, Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/6/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DelSole

MONITORING WELL ID#: MW-9 NOTES TAKEN BY: Deb DelSole

DEPTH TO WATER: 13.06 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 20.0 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 6.94 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.11 GALLONS

VOLUMES PURGED: 8 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 10:03 Am ; TIME FINISHED: 10:50

OBSERVATIONS: COLOR cloudy/clear ; ODOR none

SHEEN none ; TURBIDITY 28 NTU

OTHER

WATER RECOVERY HEIGHT: 13.12 ; RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH 6.83 ~~0.1°C~~ , TEMPERATURE 14.2°C

CONDUCTIVITY 860 uS ~~UMHO/CM~~, OTHER

SAMPLE COLLECTION TIME: 10:50

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals, Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DeLisle

MONITORING WELL ID#: MW-10 NOTES TAKEN BY: Deb DeLisle

DEPTH TO WATER: 9.9 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 17.4 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.5 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.2 GALLONS

VOLUMES PURGED: GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 1:03 ; TIME FINISHED: 1:35

OBSERVATIONS: COLOR clear ; ODOR petroleum/solvent odor

SHEEN none ; TURBIDITY 28.3 NTU

OTHER

WATER RECOVERY HEIGHT: 9.8 ; RECOVERY TIME IN MINUTES: 30

FIELD PARAMETERS: pH 6.70 , TEMPERATURE 11.1 °C

CONDUCTIVITY 2.93 mS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 1415

NOTES: Samples collected for TCL VOCs, TCL SVOCs, Pesticides, PCBs TAL Metals & Cyanide collected Equipment Blank before this well

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DelSole

MONITORING WELL ID#: MW-11 NOTES TAKEN BY: Deb DelSole

DEPTH TO WATER: 5.55 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 17.1 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 11.55 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.85 GALLONS

VOLUMES PURGED: 6.5 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 10:19 ; TIME FINISHED: 11:00

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 28.5

OTHER

WATER RECOVERY HEIGHT: 5.6 ; RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH 7.34 , TEMPERATURE 11.3°C

CONDUCTIVITY 580 µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 11:00

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals & Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/7/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb Del S.L

MONITORING WELL ID#: MW-12 NOTES TAKEN BY: Deb Del S.L

DEPTH TO WATER: 8.9 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 17.1 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 8.2 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.31 GALLONS

VOLUMES PURGED: 5 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 8:45Am ; TIME FINISHED: 9:36

OBSERVATIONS: COLOR cloudy ; ODOR none

SHEEN none ; TURBIDITY 40.4 NTU

OTHER

WATER RECOVERY HEIGHT: 8 ft ; RECOVERY TIME IN MINUTES: 9 min

FIELD PARAMETERS: pH 6.97 , TEMPERATURE 9.1 °C

CONDUCTIVITY 2.91 MS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 9:45 am

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals, Cyanide

: took MS/MSD here

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/7/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: DebDelSch

MONITORING WELL ID#: MW-13 NOTES TAKEN BY: DebDelSch

DEPTH TO WATER: 1.2 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 10.3 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 9.1 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 0.58 GALLONS

VOLUMES PURGED: 2 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 1:35 ; TIME FINISHED: 1:55

OBSERVATIONS: COLOR cloudy ; ODOR Strong - petroleum-like

SHEEN none ; TURBIDITY 153 NTU

OTHER

WATER RECOVERY HEIGHT: 1.3 ; RECOVERY TIME IN MINUTES: 45

FIELD PARAMETERS: pH 7.43 , TEMPERATURE 9.4 °C

CONDUCTIVITY 1579 µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 2:40

NOTES: Samples collected for TCL VOCs, TCL SVOCs, Pesticides, PCB, TAL Metals & Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb Del S.L

MONITORING WELL ID#: MW-14 NOTES TAKEN BY: Deb Del S.L

DEPTH TO WATER: 10.8 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 17.6 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 6.8 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

WELL CASING DIAMETER			
	1.25" = 0.064 GALLONS	4" = 0.66 GALLONS	
	2" = 0.16 GALLONS	6" = 1.47 GALLONS	
	3" = 0.38 GALLONS	1" = 0.41 GALLONS	

WELL VOLUME: 1.088 GALLONS

VOLUMES PURGED: 4 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 11:35 ; TIME FINISHED: 12:05

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 20.1 NTU

OTHER

WATER RECOVERY HEIGHT: 10.4 ; RECOVERY TIME IN MINUTES: 95

FIELD PARAMETERS: pH 7.23 , TEMPERATURE 13.7°C

CONDUCTIVITY 850 µSUMHO/CM, OTHER

SAMPLE COLLECTION TIME: ~~12:05~~ 1:45

NOTES: Samples collected for TCL VOCs, TCL SVOCs, Pesticides, PCBs, TAL Metals & Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/7/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: D. & D. Del Sole

MONITORING WELL ID#: MW-15 NOTES TAKEN BY: D. & D. Del S.

DEPTH TO WATER: 2.92 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 11.25 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 8.33 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 0.53 GALLONS

VOLUMES PURGED: 5.25 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 12:00 ; TIME FINISHED: 12:32

OBSERVATIONS: COLOR Smoky grey ; ODOR Slight petroleum-like

SHEEN None ; TURBIDITY 138 NTU

OTHER

WATER RECOVERY HEIGHT: 2.65 ; RECOVERY TIME IN MINUTES: 10

FIELD PARAMETERS: pH 7.21 , TEMPERATURE 7.2°C

CONDUCTIVITY 1207 µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 12:45

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals & Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DeLisle

MONITORING WELL ID#: B-2 NOTES TAKEN BY: Deb DeLisle

DEPTH TO WATER: 7.95 FROM: T/O PVC BAILER ID:

DEPTH TO BOTTOM: 15 FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.05 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: 1.128 GALLONS

VOLUMES PURGED: 7 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 8:55 ; TIME FINISHED: 9:37

OBSERVATIONS: COLOR rust brown to clear ; ODOR Slight solvent odor

SHEEN None ; TURBIDITY 12.8 NTU

OTHER

WATER RECOVERY HEIGHT: 8.0 ft ; RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH 6.68 , TEMPERATURE 10.2°C

CONDUCTIVITY 705 µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 9:38

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals & Cyanide

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/7/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DeLisle

MONITORING WELL ID#: B-3 NOTES TAKEN BY: Deb DeLisle

DEPTH TO WATER: 3.50 ~~4.5~~ FROM: T/O PVC where it is broken off BAILER ID:

DEPTH TO BOTTOM: 11.15 FROM: T/O PVC where it is broken off BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: 7.65 BAILER: STAINLESS STEEL

OTHER Geotech Geopump 2

WELL CASING DIAMETER

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS 4" = 0.66 GALLONS

2" = 0.16 GALLONS 6" = 1.47 GALLONS

3" = 0.38 GALLONS 1" = 0.41 GALLONS

WELL VOLUME: 1.224 GALLONS

VOLUMES PURGED: 6 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 10:40 ; TIME FINISHED: 11:15

OBSERVATIONS: COLOR clear to slightly cloudy; ODOR none

SHEEN none ; TURBIDITY 10.2 NTU

OTHER

WATER RECOVERY HEIGHT: 3.5 ; RECOVERY TIME IN MINUTES: NA

FIELD PARAMETERS: pH 7.20 , TEMPERATURE 10.2°C

CONDUCTIVITY 1018µS UMHO/CM, OTHER

SAMPLE COLLECTION TIME: 11:15

NOTES: Samples collected for TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals & Cyanide

took Duplicate sample here

MAC-123a
Sheet 1 of __

C.T. MALE ASSOCIATES, P.C.

Groundwater Services Field Log

DATE: 5/8/02 PROJECT NAME: Independent Leather

PROJECT NO.: 01.7293 PROJECT LOCATION: Gloversville, NY

SAMPLING PERSONNEL: Deb DeLisle

MONITORING WELL ID#: Equipment Blank NOTES TAKEN BY: Deb DeLisle

DEPTH TO WATER: — FROM: T/O PVC BAILER ID: _____

DEPTH TO BOTTOM: — FROM: T/O PVC BAILER: LAB CLEANED / FIELD CLEANED

WATER COLUMN HEIGHT: — BAILER: STAINLESS STEEL _____

OTHER Geotech Geopump 2

CONVERSION FACTORS LINEAR FEET TO GALLONS

1.25" = 0.064 GALLONS	4" = 0.66 GALLONS
2" = 0.16 GALLONS	6" = 1.47 GALLONS
3" = 0.38 GALLONS	1" = 0.41 GALLONS

WELL CASING DIAMETER

WELL VOLUME: — GALLONS

VOLUMES PURGED: — GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: — ; TIME FINISHED: —

OBSERVATIONS: COLOR — ; ODOR —

SHEEN — ; TURBIDITY —

OTHER — —

WATER RECOVERY HEIGHT: — ; RECOVERY TIME IN MINUTES: —

FIELD PARAMETERS: pH — , TEMPERATURE _____

CONDUCTIVITY _____ UMHO/CM, OTHER _____

SAMPLE COLLECTION TIME: 12:40

NOTES: Samples collected for TCL VOCs, TCL SVOCs, Pesticides, PCBs, TAL Metals, Cyanide

took before MW-10

MAC-123a
Sheet 1 of __

EXHIBIT 1

NYSDEC WORK PLAN APPROVAL LETTER

New York State Department of Environmental Conservation
Office of Environmental Quality, Region 5
Route 86 – P.O. Box 296, Ray Brook, New York 12977
Phone: (518) 897-1242/1243 • **FAX:** (518) 897-1245
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

December 17, 2001

The Honorable Abraham Seroussi, Mayor
City of Gloversville
City Hall
3 Frontage Street
Gloversville, NY 12078-2897

RE: Independent Leather Brownfield Project B-00158-5
South Main Street, City of Gloversville, Fulton County
Approval of Work Plan/Budget

Dear Mayor Seroussi:

Final Work Plan Approval

The November 2001 "Site Investigation Work Plan," completed by CT Male Associates, PC for the Independent Leather site in Gloversville has been approved by the Department as of December 17, 2001.

Field work may begin at the location.

If you have questions or comments, please contact me at (518) 897-1242.

Sincerely,

Michael P. McLean

Michael P. McLean, P.E.
Environmental Engineer 1

MPM:slq

cc: Mr. Kirk Moline, CT Male Associates
Mr. John Durnin, Central Office Brownfield Coordinator
Mr. Ronald Ellis, Sr., Director of Public Works, Gloversville
Mr. Greg Rys, NYSDOH w/enc.
Mr. Jerome Fraine, NYSDEC w/enc.

EXHIBIT 2

GROUND PENETRATION RADAR SURVEY REPORT

GROUND PENETRATING RADAR SURVEY RESULTS

FOR THE

INVESTIGATION FOR THE
LOCATION OF
UNDERGROUND STORAGE TANKS

AT

INDEPENDENT LEATHER
321-333 S. MAIN STREET
GLOVERSVILLE, NY

PREPARED FOR
C.T. MALE ASSOCIATES
50 CENTURY HILL DRIVE
LATHAM, NY 12110

PREPARED BY

SUB-SURFACE INFORMATIONAL SURVEYS, INC.
MONITOR BUILDING
145 SHAKER ROAD
E. LONGMEADOW, MASSACHUSETTS 01028-0452

MAY 6, 2002

GPR TABLE OF CONTENTS

SUB-SURFACE INFORMATIONAL SURVEYS, INC.

Monitor Building
145 Shaker Road
Post Office Box 452
E. Longmeadow, MA 01028-0452

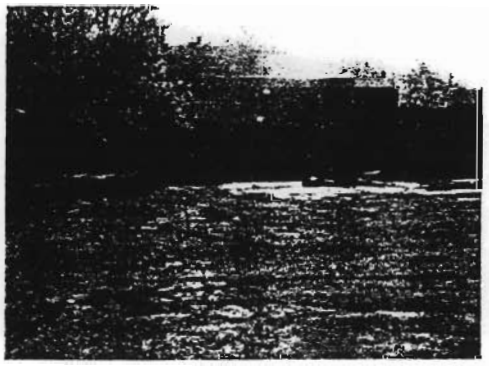
Phone - 413-525-4666
Fax - 413-525-2887
Web - www.subsurfaceinc.com
Email - bacan@gte.net

1.0 Introduction

In accordance with your authorization, Sub-Surface Informational Surveys, Inc. (SIS) reports to you the results of ground penetrating radar, conductive, inductive and passive utility location survey performed on Thursday, April 4, 2002 and Friday, April 5, 2002 at the Portsmouth Naval Shipyard in the City of Kittery, ME. This survey was directed by your approval of SIS quotation #1.1790.02.03 Amended April 3, 2002.

1.1 Purpose and Scope

The purpose of the survey was to investigate for the presence of suspected underground storage tanks and/or buried drums.



2.0 Geophysical Survey

The geophysical survey was performed by Sub-Surface Informational Surveys, Inc. A transducer operator along with a supervising GPR technician performed the survey.

2.1 Geophysical Survey Procedures

The depth setting of the GPR survey was approximately 6.4' to locate any existing underground storage tanks. (UST's) A traverse grid with a 4.0' minimum spacing was used to conduct the GPR survey. Typically a 5.0' – 10.0' spacing is sufficient to detect all large capacity UST's (500-gallon or greater) with a high degree of certainty. The spacing of 4.0' was used to better define any existing suspected anomalies.

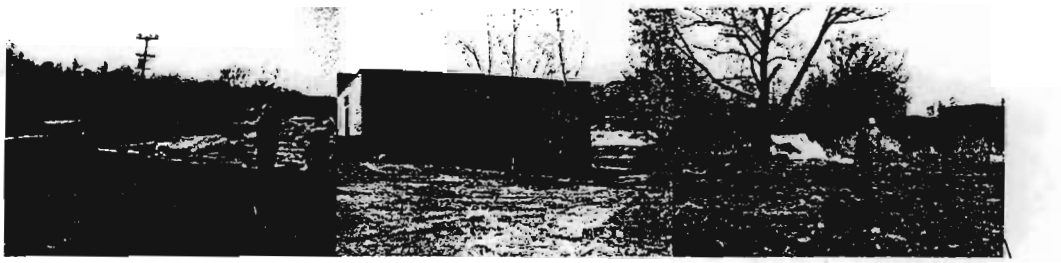
The equipment used to conduct the geophysical survey included GPR equipment which consists of subsurface **interface radar (SIR-2000)** computer manufactured by Geophysical Survey Systems, Inc., power supply, graphic recorder, video display unit and transmitting/receiving antenna. The equipment is known collectively as a **GPR system**. The transmitting/receiving antenna transmits electromagnetic signals into the subsurface and then detects, amplifies and displays reflections of the signal on a graphic recorder and a video display unit. As the antenna is moved slowly across the ground surface or surface of contact, a radar image of the subsurface is produced. The maximum depth of penetration of the GPR signal and the resolution of the reflections are a function of the antenna frequency and the electrical properties of the subsurface. As electrical conductivity of the subsurface increases, GPR signal penetration decreases. GPR reflections are produced by spatial changes in the physical properties of the subsurface (I.e., type of material, presence of any subsurface fluid, and porosity) and related changes in the electrical properties of the subsurface material in the path of the signals. The greater the difference, the stronger the observed GPR reflection.

Characteristics that are considered in the interpretation of GPR data from a given site include the size, shape and amplitude of the reflections. Metallic underground storage tanks, (UST's) utilities and conduits have electrical properties uniquely different from those of the soils in which they are buried. As a result, the GPR reflections are usually of high amplitude and have distinctive shapes. For GPR profiles oriented perpendicular to the long axis of the tanks, the signature is similar to a hyperbola. The signature is also a function of the tank diameter.

2.2 Geophysical Survey Results

Area surveyed represented sectors shown in Attachment A-1 with this report. The sectors are as follows:

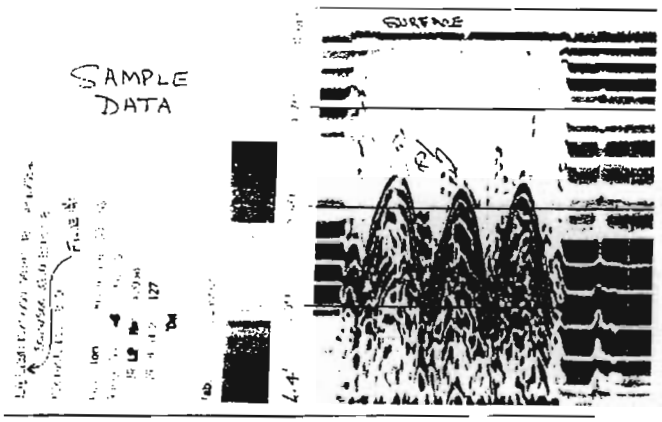
1. 220' north/south X 65' east/west (approximate)
2. 330' north/south X 40' east/west (approximate)
3. 120' X 120' (approximate)



Left - S-1 / Center - S-2 / Right – S-3
(Shows beginning of each sector)

Each of the areas surveyed were profiled in both a north/south and east/west direction at 4.0' parallel intervals. In Sector 1 (S-1) the southern end, was surveyed at 1.0' – 2.0' parallel traverses which had to be selected due to the unevenness of the surface. No unusual parabolic features were seen in the data that would indicate the presence of any underground storage tanks and/or multiple drums. Some of the data shows a defined water table near 7.0' below the surface with a varied capillary fringe. The following is a brief description of some of the collected data with photos showing the area of their collection. Data files are marked with S-1, S-2 or S-3 showing the sector in which it was collected.

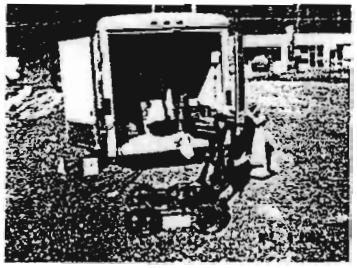
ACQUIRED DATA EXPLANATION



Above represents a sample of data collected by Sub-Surface Informational Surveys, Inc. on October 17, 1999 at a site in the State of Connecticut. It shows three (3) underground storage tanks with a marked centerline. The data FILE# is located on the left tab which also shows the nanosecond (depth) setting, dielectric constant, etc., which is set by our SIR-2000 computer operator. Please match the FILE# on the data with the same FILE# in this report for an explanation of the collected data. NOTE: The above is <u>not</u> part of the data collected for this survey.

FILE214 represents an easterly traverse of approximately 80 linear feet. This is showing an equitable distribution of the subsurface signal to approximately 6.4' below the surface. No unusual features or hyperbolas. FILE215 through FILE217 represent parallel traverses at 4.0' intervals showing little change in this area of the survey. FILE225 and FILE226 represent parallel traverses south of SSW3. Unchanged in subsurface data.

Data collection in 1st sector (S-1) - Cones are at 4.0' intervals to maintain grid.



GPR cart w/500 MHz antenna

NOTE: Cones were used in large areas in order to maintain a consistent 4.0' grid. In areas where it was impossible to maintain the 4.0', a smaller grid of 1.0' – 2.0' was implemented. The 4.0' was the maximum spacing. Sectors 1 & 2 were surveyed using the gpr cart seen in the photos. Sector 3, an alternate 500MHz antenna was used with our 150' cable and a handle for ease of operation. The cart was unable to be used due to the uneven surface.

Hand pulling 500MHz w/handle & cable

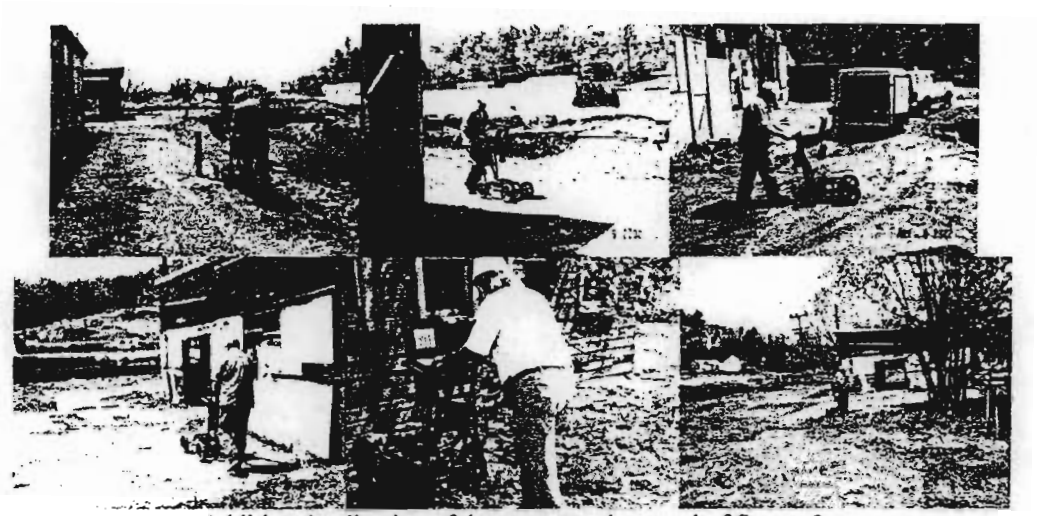
FILE239 through FILE245 represent multiple, short traverses over the plastic covered area of S-1. These profiles were selected based on the surface topography. Areas where the surface was flat, a profile was taken. No unusual anomalies in any of this data.

Data collection over plastic covered area in Sector 1

Sector 2 represented an area starting at the northwest corner of the property on the north side of the Secondary Tannery Building #2. Traverses were collected in both north/south and east/west directions along the western side of the building including the three sides of the storage building at the southern end of the corridor. No unusual anomalies were seen to indicate the presence of any underground storage tanks.

FILE249 through FILE257 represent data collected on the north and west sides of the Secondary Tannery Building. All shows a clear penetration to the base of the gpr window of 6.4' with no unusual hyperbolic features. The subsoil's appear to be similar throughout the entire data showing no metallic reflections or unusual subsurface features.

Collection of data in Sector 2



Additional collection of data near southern end of Sector 2

FILE288 through 297 represent data collection in Sector 3, southeast corner. All of the data collected in this area shows a high conductivity reading near the 7.0' depth which appears to be that of the water table. During the gpr investigation, the depth was varied from 33.5' nanoseconds to more than 60 nanoseconds looking for the optimal range. No parabolic features were found in this sector indicating the presence of any underground storage tanks and/or drums.

Sector 3 collection of data

3.0 ANALYTICAL RESULTS - SIR-2000

The attached analytical results are copies of data files taken from the field and reproduced on 11" X 17" paper. After reproducing the data, selected samples are taken and duplicated for this report.

Copies are made under the following guidelines:

A. When there are distinctive differences in the collected data. NOTE: When one traverse is almost identical in characterization to another, only one copy would be made.

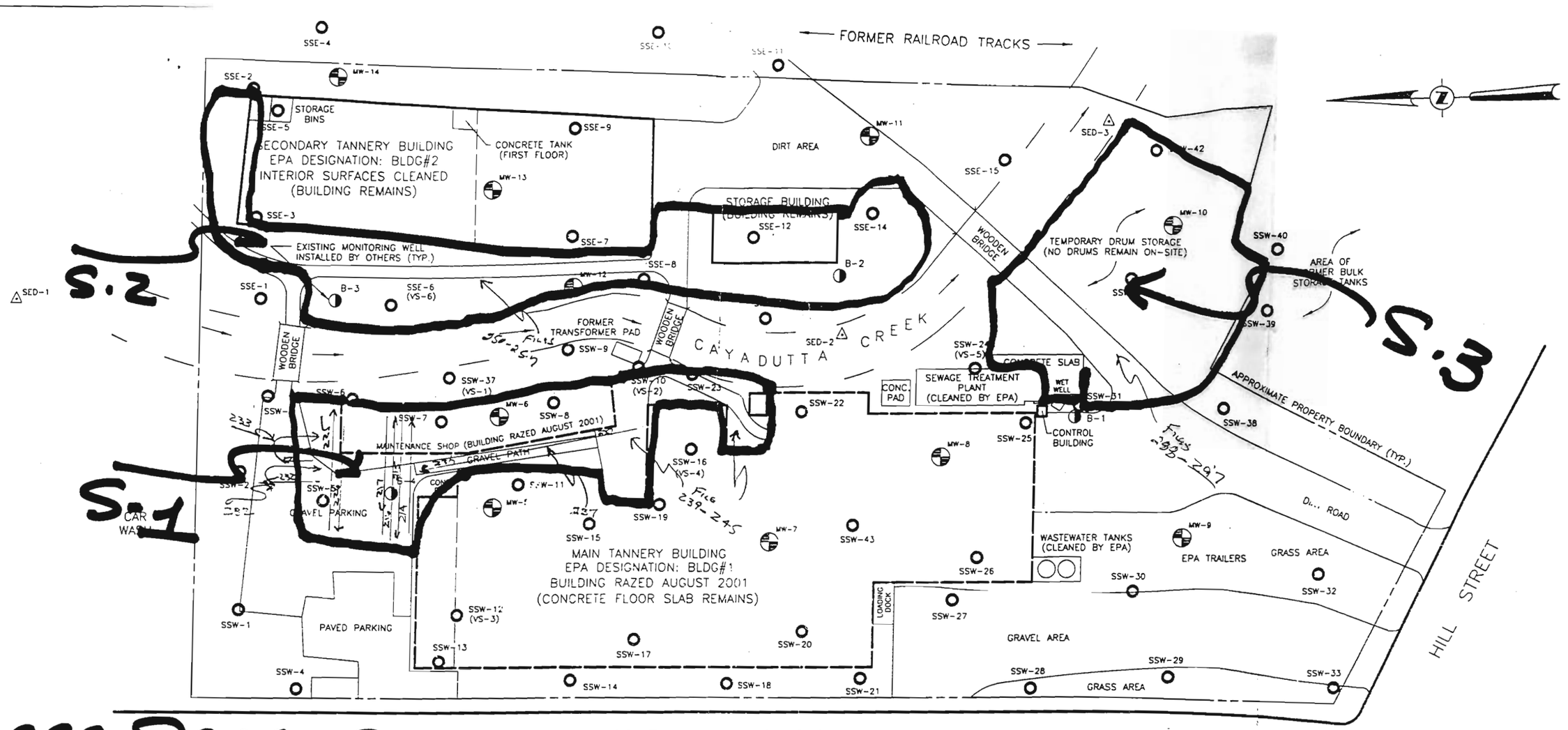
B. If there is a significant difference with a suspected anomaly found within the data.

C. In the location of anomalies such as pipes and/or conduits, underground storage tanks or other specific characteristics important to the investigation, such data is copied and annotated.

D. Samples of *signal refusal.* (water, clay or some other highly conductive interface)

E. Requested data.

F. Specific locations of rebar and conduits using encoder wheel with measured bench marks.



GPR SECTORS ATTACHMENT "A-1"

B-1 EXISTING MONITORING WELLS B-1 THROUGH B-4

SSW-33 EPA SURFICIAL AND/OR DEEP SAMPLING LOCATION

SED-1 EPA SEDIMENT SAMPLING LOCATION

SB PROPOSED TEST BORING & MONITORING WELL LOCATIONS

NOTE:
THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPROXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

DATE	REVISIONS RECORD/DESCRIPTION	DRAFTED	CHECK	APPR.
1	Sample Data Points			
2				
3				
4				
5				
6				
7				
8				

DESIGNED:
DRAFTED : JAM
CHECKED : KM
PROJ. NO : 01.7293
SCALE : ±1"=50'
DATE : APRIL 2002

INDEPENDENT LEATHER TANNERY

TEST BORING & MONITORING WELL LOCATIONS

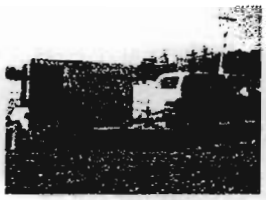
CITY OF GLOVERSVILLE — FULTON COUNTY, NEW YORK

C.T. MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE, P.O. BOX 727, LATHAM, NY 12110
518.786.7400 • FAX 518.786.7299
ARCHITECTURE & BUILDING SYSTEMS ENGINEERING • CIVIL ENGINEERING
ENVIRONMENTAL SERVICES • SURVEY & LAND INFORMATION SERVICES

SHEET 1 OF 1
DWG. NO:

CT Male 5-6-02 - Gloversville 001

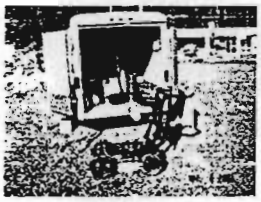
CT Male 5-6-02 - Gloversville 002



CT Male 5-6-02 - Gloversville 003

CT Male 5-6-02 - Gloversville 004

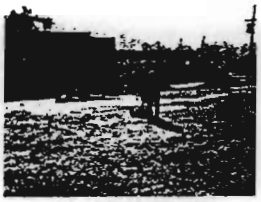
CT Male 5-6-02 - Gloversville 005



CT Male 5-6-02 - Gloversville 006

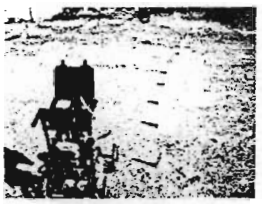
CT Male 5-6-02 - Gloversville 007

CT Male 5-6-02 - Gloversville 008



CT Male 5-6-02 - Gloversville 009

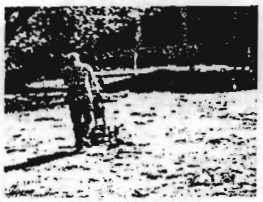
CT Male 5-6-02 - Gloversville 010



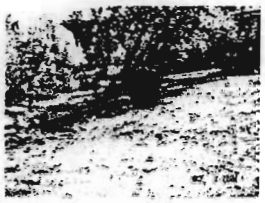
CT Male 5-6-02 - Gloversville 011

CT Male 5-6-02 - Gloversville 012

CT Male 5-6-02 - Gloversville 013

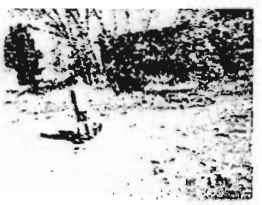


CT Male 5-6-02 - Gloversville 014

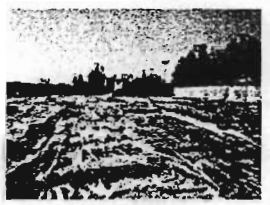


CT Male 5-6-02 - Gloversville 015

CT Male 5-6-02 - Gloversville 016



CT Male 5-6-02 - Gloversville 017

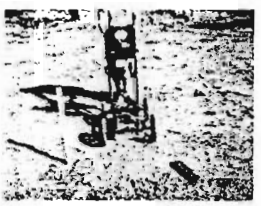


CT Male 5-6-02 - Gloversville 018

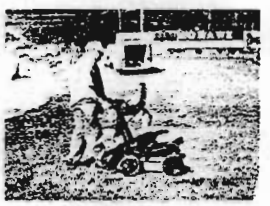
CT Male 5-6-02 - Gloversville 019

CT Male 5-6-02 - Gloversville 020

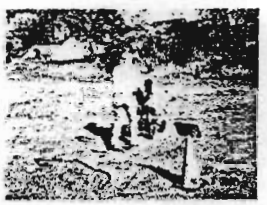
CT Male 5-6-02 - Gloversville 021



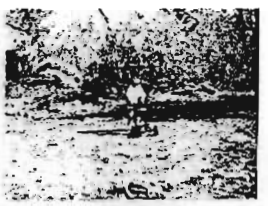
CT Male 5-6-02 - Gloversville 022



CT Male 5-6-02 - Gloversville 023



CT Male 5-6-02 - Gloversville 024



CT Male 5-6-02 - Gloversville 025

CT Male 5-6-02 - Gloversville 026

CT Male 5-6-02 - Gloversville 027

CT Male 5-6-02 - Gloversville 028

CT Male 5-6-02 - Gloversville 029

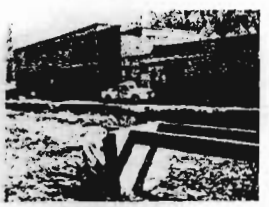
CT Male 5-6-02 - Gloversville 030

CT Male 5-6-02 - Gloversville 031

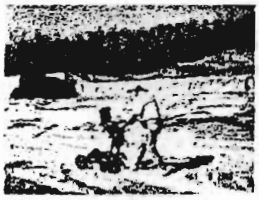
CT Male 5-6-02 - Gloversville 032

CT Male 5-6-02 - Gloversville 033

CT Male 5-6-02 - Gloversville 034



CT Male 5-6-02 - Gloversville 035

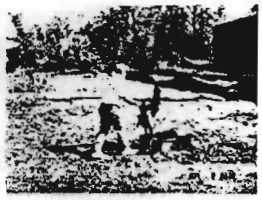


CT Male 5-6-02 - Gloversville 036

CT Male 5-6-02 - Gloversville 037

CT Male 5-6-02 - Gloversville 038

CT Male 5-6-02 - Gloversville 039



CT Male 5-6-02 - Gloversville 040

CT Male 5-6-02 - Gloversville 041

CT Male 5-6-02 - Gloversville 042

CT Male 5-6-02 - Gloversville 043

CT Male 5-6-02 - Gloversville 044

CT Male 5-6-02 - Gloversville 045

CT Male 5-6-02 - Gloversville 046

CT Male 5-6-02 - Gloversville 047

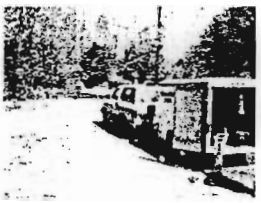
CT Male 5-6-02 - Gloversville 048

CT Male 5-6-02 - Gloversville 049

CT Male 5-6-02 - Gloversville 050

CT Male 5-6-02 - Gloversville 051

CT Male 5-6-02 - Gloversville 052



CT Male 5-6-02 - Gloversville 053

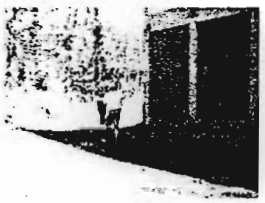
CT Male 5-6-02 - Gloversville 054

CT Male 5-6-02 - Gloversville 055

CT Male 5-6-02 - Gloversville 056

CT Male 5-6-02 - Gloversville 057

CT Male 5-6-02 - Gloversville 058



CT Male 5-6-02 - Gloversville 059

CT Male 5-6-02 - Gloversville 060

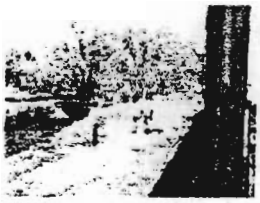
CT Male 5-6-02 - Gloversville 061

CT Male 5-6-02 - Gloversville 062

CT Male 5-6-02 - Gloversville 063

CT Male 5-6-02 - Gloversville 064

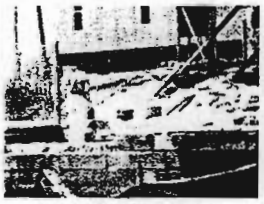
CT Male 5-6-02 - Gloversville 065



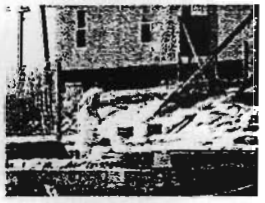
CT Male 5-6-02 - Gloversville 066

CT Male 5-6-02 - Gloversville 067

CT Male 5-6-02 - Gloversville 068



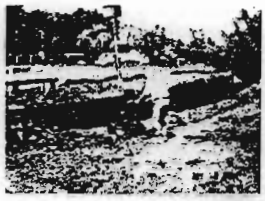
CT Male 5-6-02 - Gloversville 069



CT Male 5-6-02 - Gloversville 070

CT Male 5-6-02 - Gloversville 071

CT Male 5-6-02 - Gloversville 072



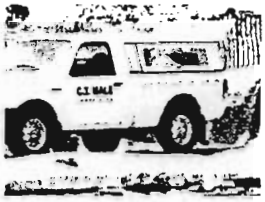
CT Male 5-6-02 - Gloversville 073

CT Male 5-6-02 - Gloversville 074

CT Male 5-6-02 - Gloversville 075

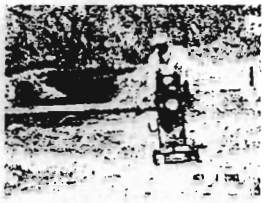
CT Male 5-6-02 - Gloversville 076

CT Male 5-6-02 - Gloversville 077

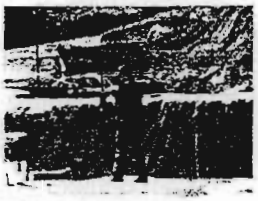


CT Male 5-6-02 - Gloversville 078

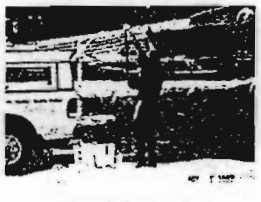
CT Male 5-6-02 - Gloversville 079



CT Male 5-6-02 - Gloversville 080

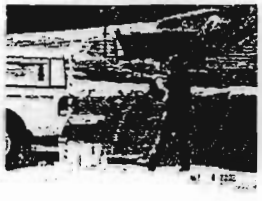


CT Male 5-6-02 - Gloversville 081



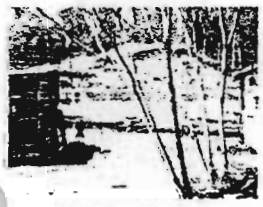
CT Male 5-6-02 - Gloversville 082

CT Male 5-6-02 - Gloversville 083



CT Male 5-6-02 - Gloversville 084

CT Male 5-6-02 - Gloversville 085



CT Male 5-6-02 - Gloversville 086

CT Male 5-6-02 - Gloversville 087

CT Male 5-6-02 - Gloversville 088

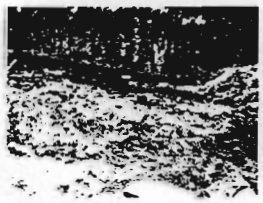
CT Male 5-6-02 - Gloversville 089

CT Male 5-6-02 - Gloversville 090

CT Male 5-6-02 - Gloversville 091

CT Male 5-6-02 - Gloversville 092

CT Male 5-6-02 - Gloversville 093

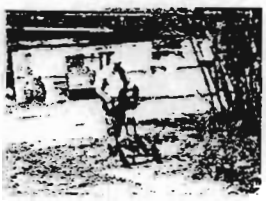


CT Male 5-6-02 - Gloversville 094

CT Male 5-6-02 - Gloversville 095

CT Male 5-6-02 - Gloversville 096

CT Male 5-6-02 - Gloversville 097



CT Male 5-6-02 - Gloversville 098

CT Male 5-6-02 - Gloversville 099

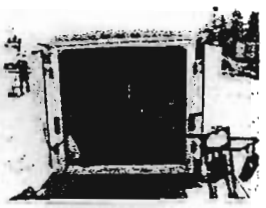
CT Male 5-6-02 - Gloversville 100

CT Male 5-6-02 - Gloversville 101

CT Male 5-6-02 - Gloversville 102

CT Male 5-6-02 - Gloversville 103

CT Male 5-6-02 - Gloversville 104



CT Male 5-6-02 - Gloversville 105

CT Male 5-6-02 - Gloversville 106

CT Male 5-6-02 - Gloversville 107

CT Male 5-6-02 - Gloversville 108

CT Male 5-6-02 - Gloversville 109

CT Male 5-6-02 - Gloversville 110

CT Male 5-6-02 - Gloversville 111

CT Male 5-6-02 - Gloversville 112

CT Male 5-6-02 - Gloversville 113

CT Male 5-6-02 - Gloversville 114

CT Male 5-6-02 - Gloversville 115

CT Male 5-6-02 - Gloversville 116

CT Male 5-6-02 - Gloversville 117

CT Male 5-6-02 - Gloversville 118

CT Male 5-6-02 - Gloversville 119

CT Male 5-6-02 - Gloversville 120

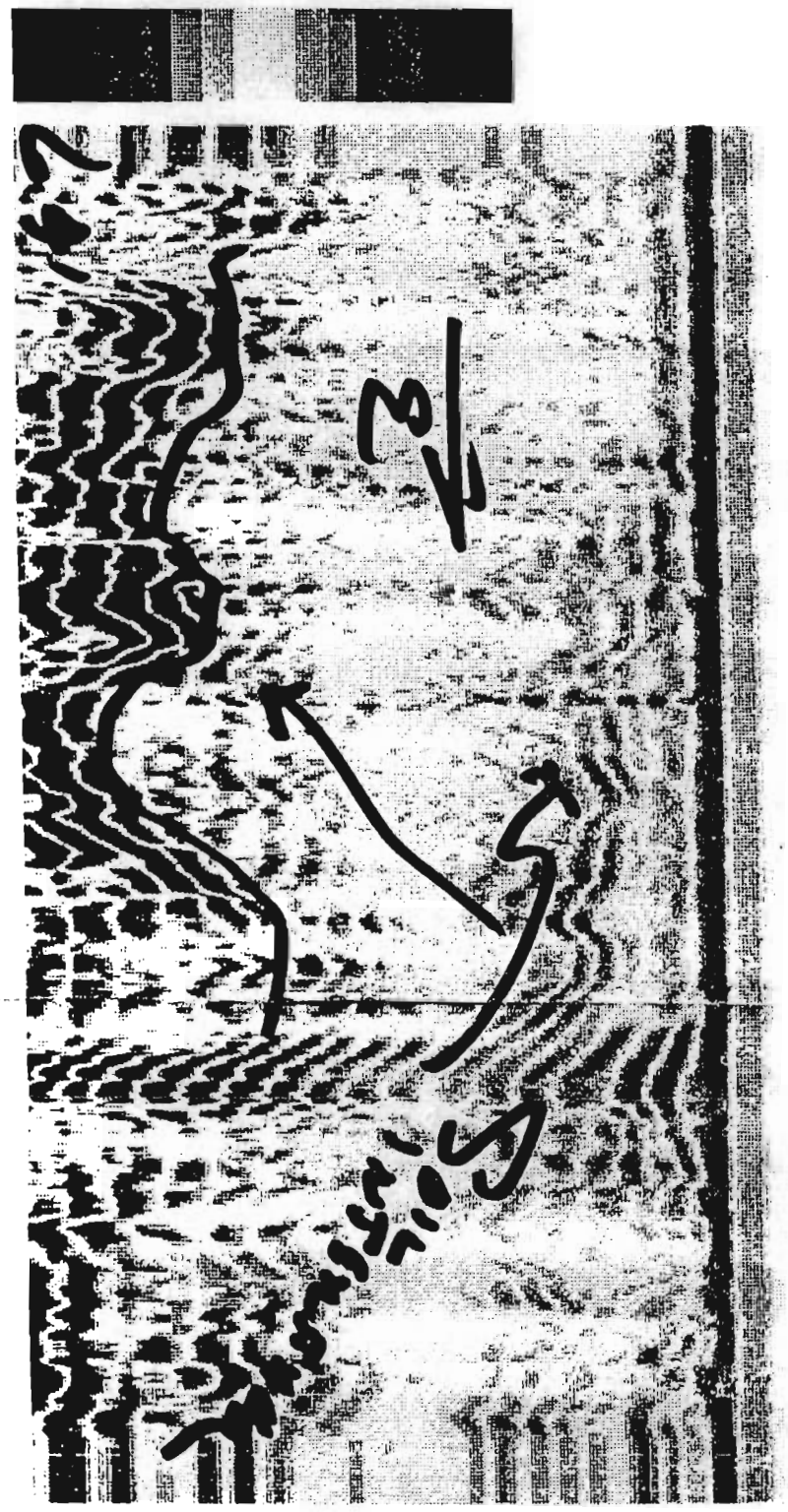
4.0 PROFILE COPIES OBTAINED IN THE FIELD

The attached copies are reproductions from data acquired in the field from the GSSI, SIR-2000 Geophysical computer. The original copies are downloaded on a T-104 thermal printer and reproduced on our commercial copier. Photo's are taken by a Sony, DSC-F707 Digital still camera using a 128MB memory stick. The camera has the ability to take pictures in a no-light environment which is useful for inside low light or no light building interiors or during overcast days. The pictures are downloaded in a Photo Suite program and reproduced at 640X480: 0.35 mega pixels. In addition, a disc is supplied with most reports of all the important photo's taken at the survey site. The image size duplicated makes it easy for an e-mail attachment to be sent to your customer.

FILE226(05/06/02 07:45:16) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 17 39 51
V(IIR LP N=1 F=1456)
V(IIR HP N=2 F=91)
H(IIR STK TC=3)

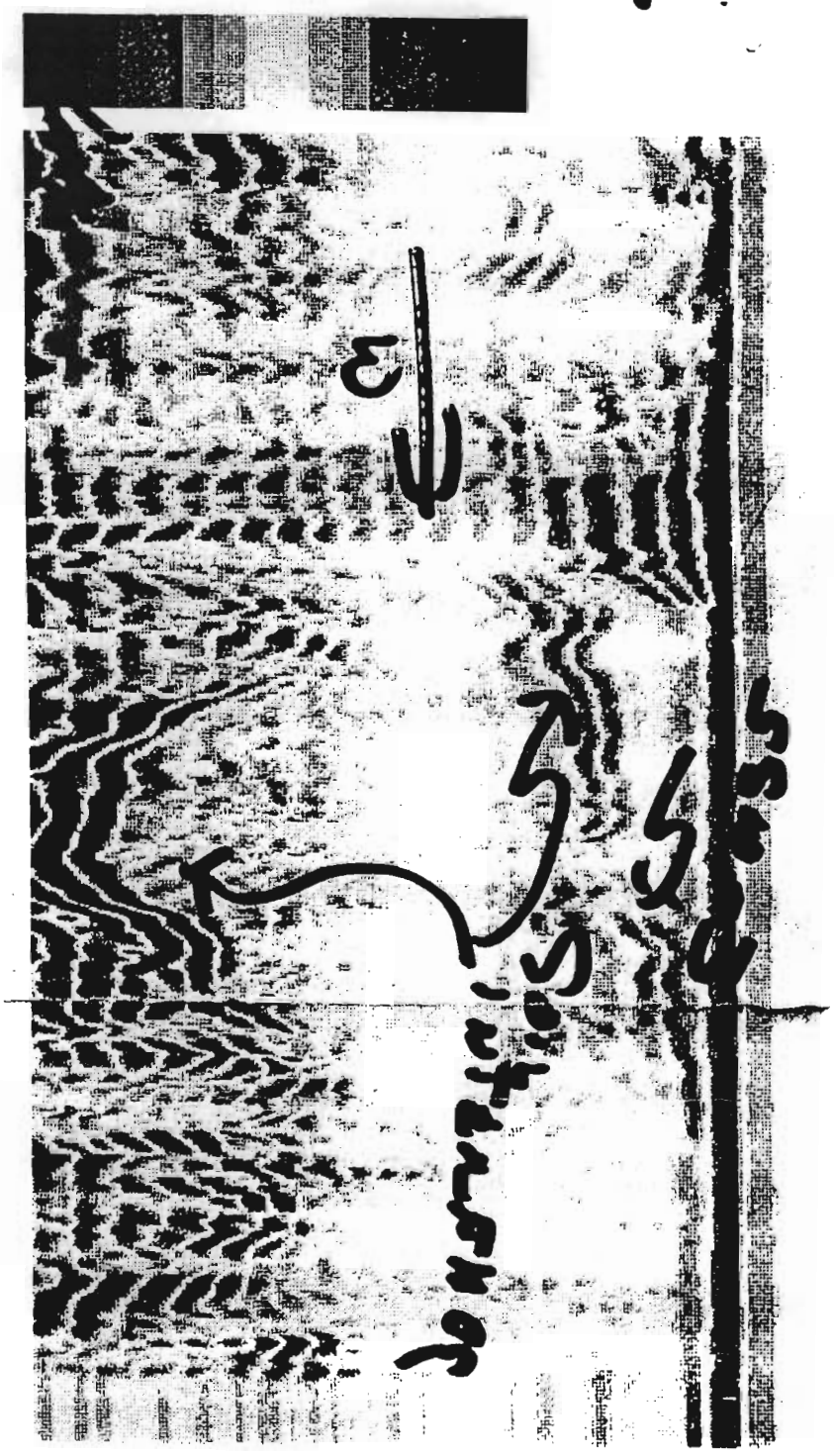
Table #15; Transform #1



FILE225(05/06/02 07:40:22) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 17 39 51
V(IIR LP N=1 F=1456)
V(IIR HP N=2 F=91)
H(IIR STK TC=3)

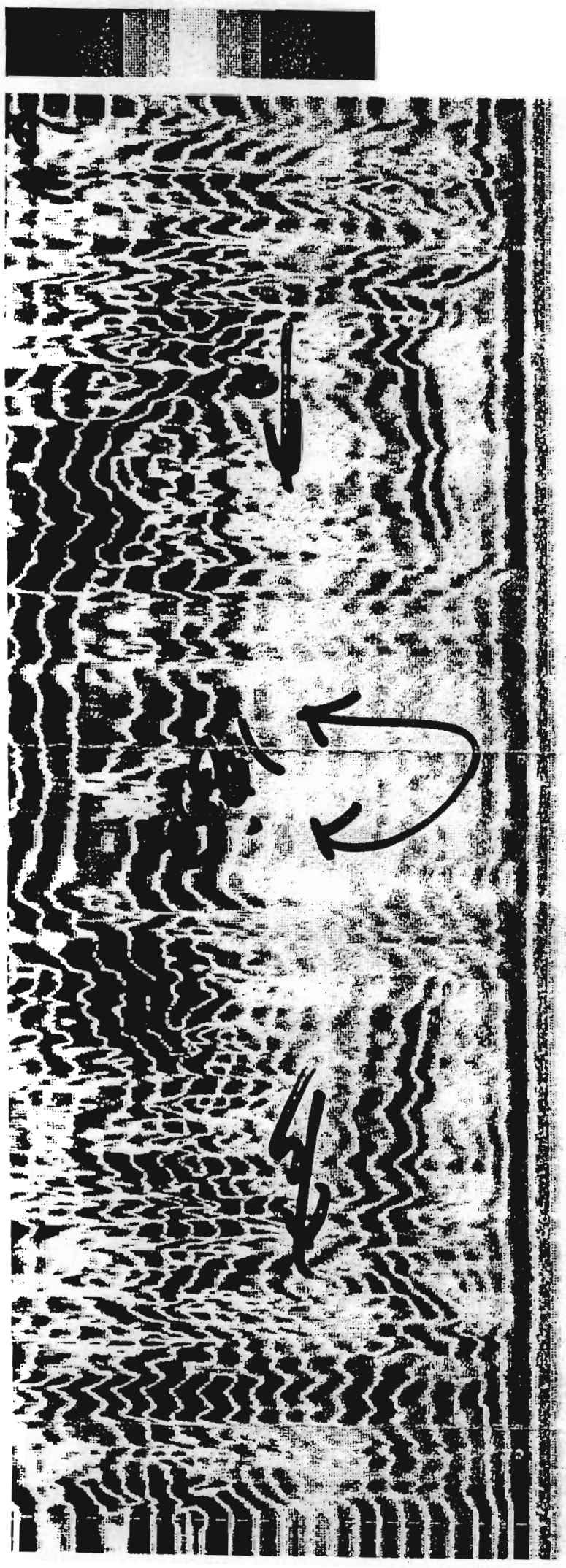
Table #15; Transform #1



FILE233(05/06/02 08:07:56) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 51 51
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

Table #15; Transform #1



FILE232(05/06/02 08:06:22) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

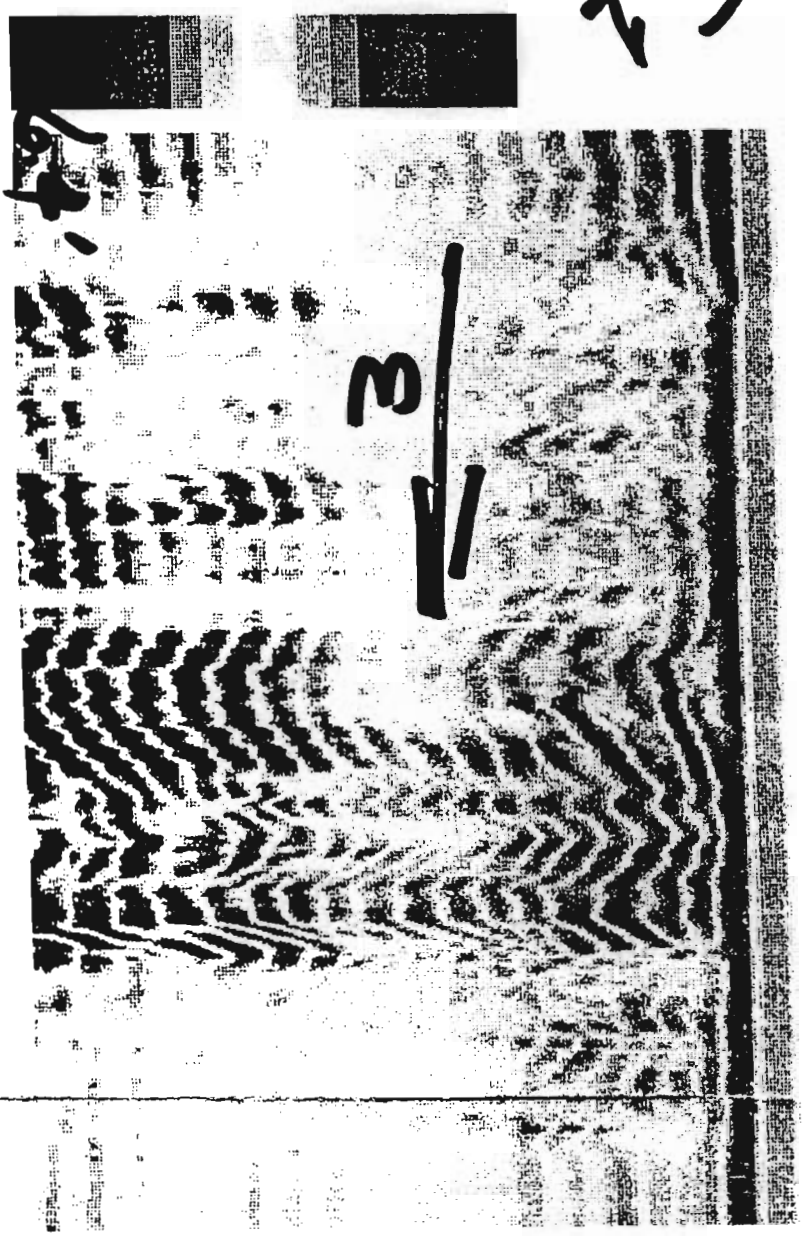
Position: 0.0nS Range: 33.5nS
Range Gain -6 23 51 51
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

Table #15; Transform #1

FILE2 05/06/02 07:14:24) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 40 50
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

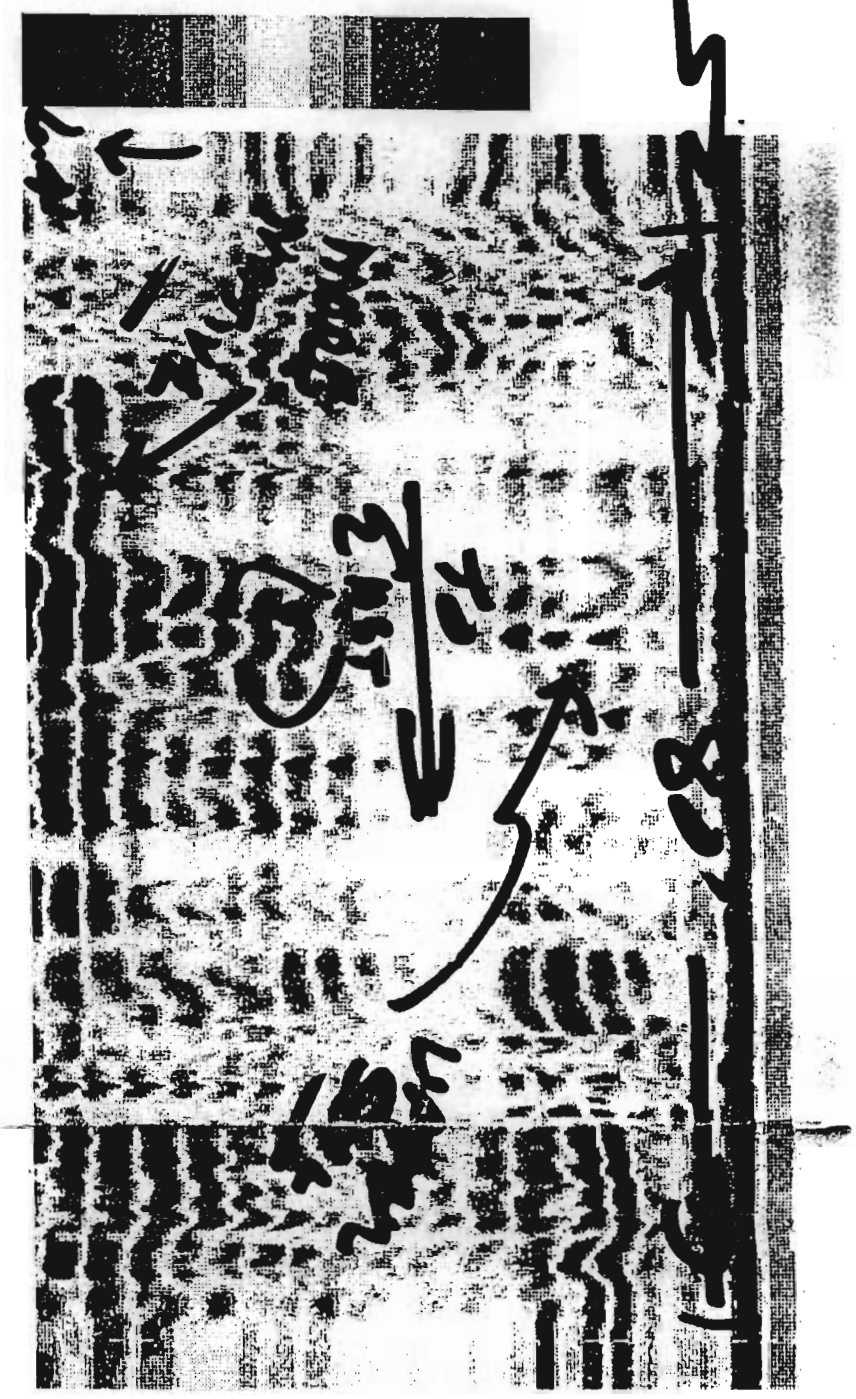
Table #15; Transform #1



FILE214(05/06/02 07:12:36) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 40 50
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

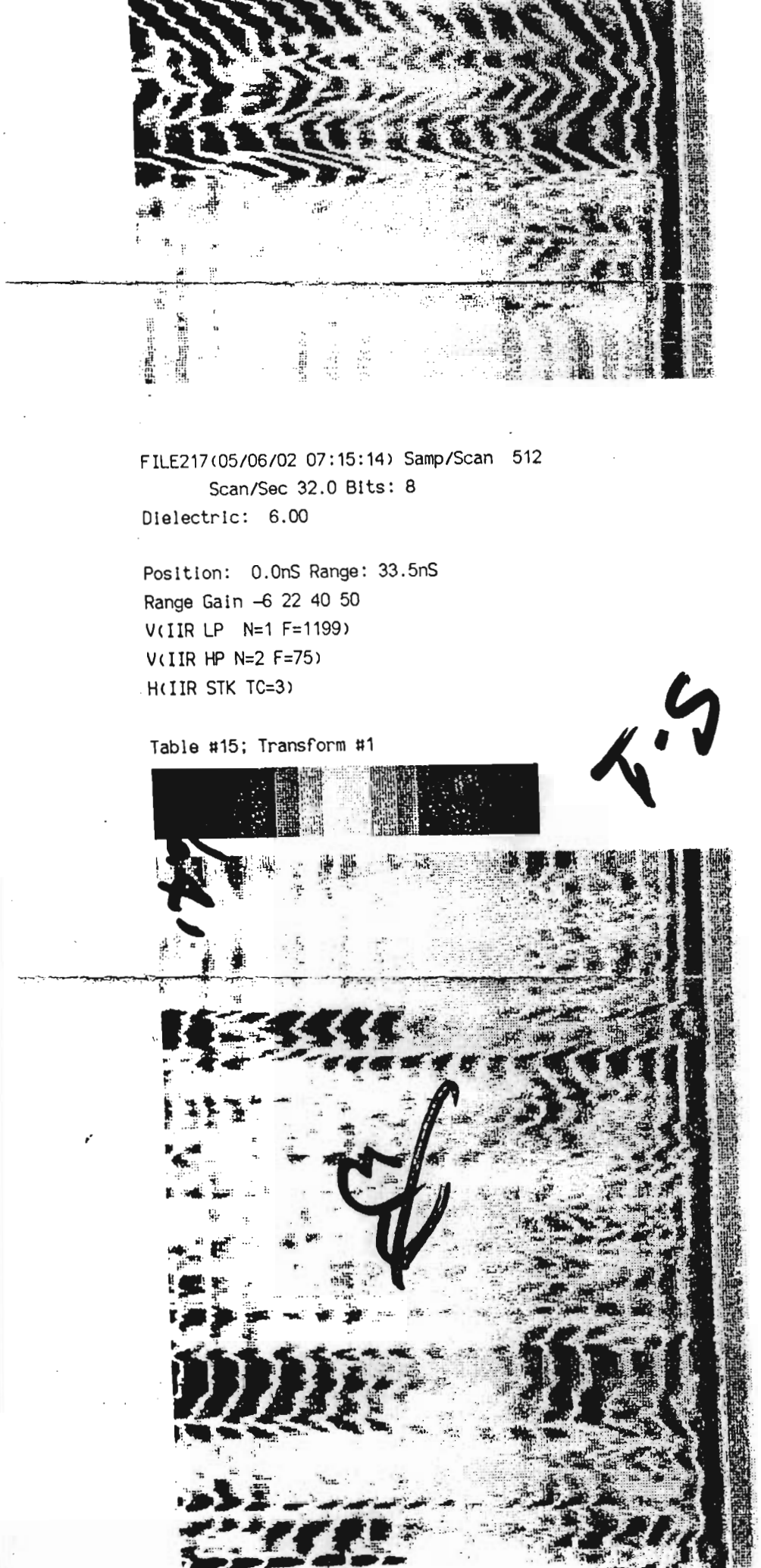
Table #15; Transform #1



FILE217(05/06/02 07:15:14) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 40 50
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

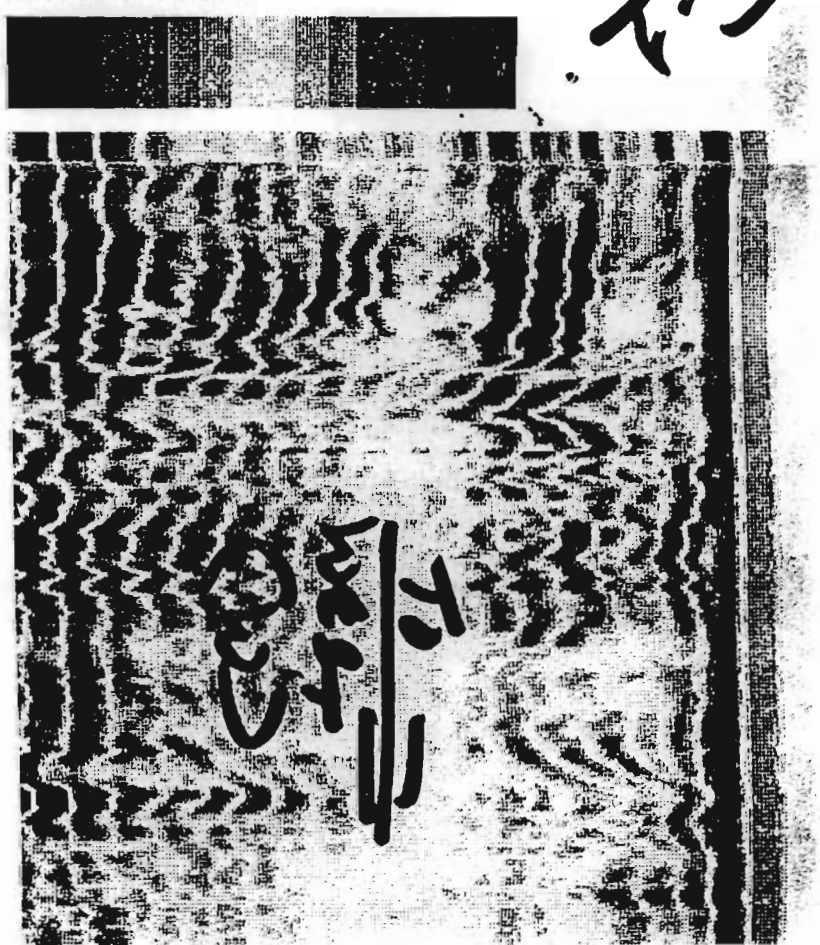
Table #15; Transform #1



FILE215(05/06/02 07:13:30) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 40 50
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

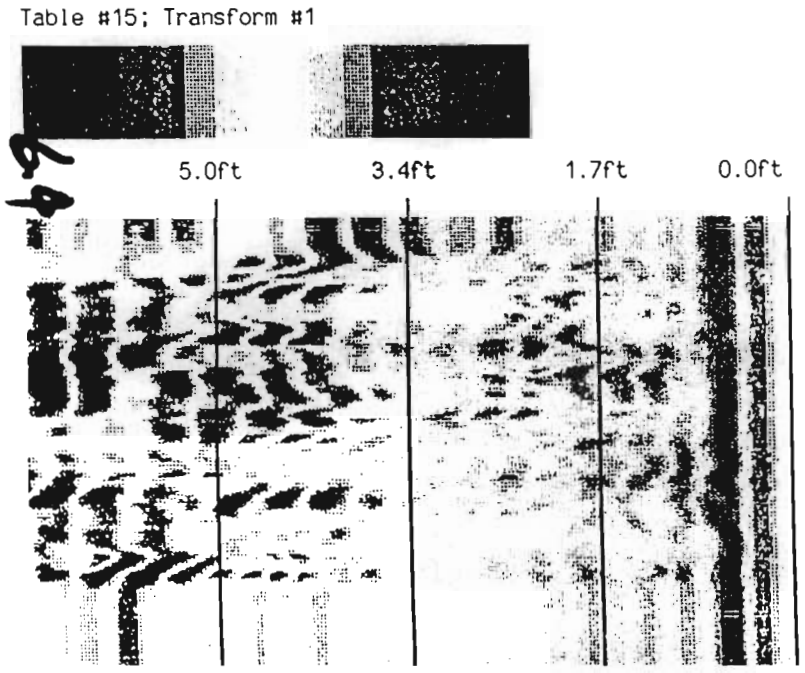
Table #15; Transform #1



FILE239(05/06/02 08:40:16) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

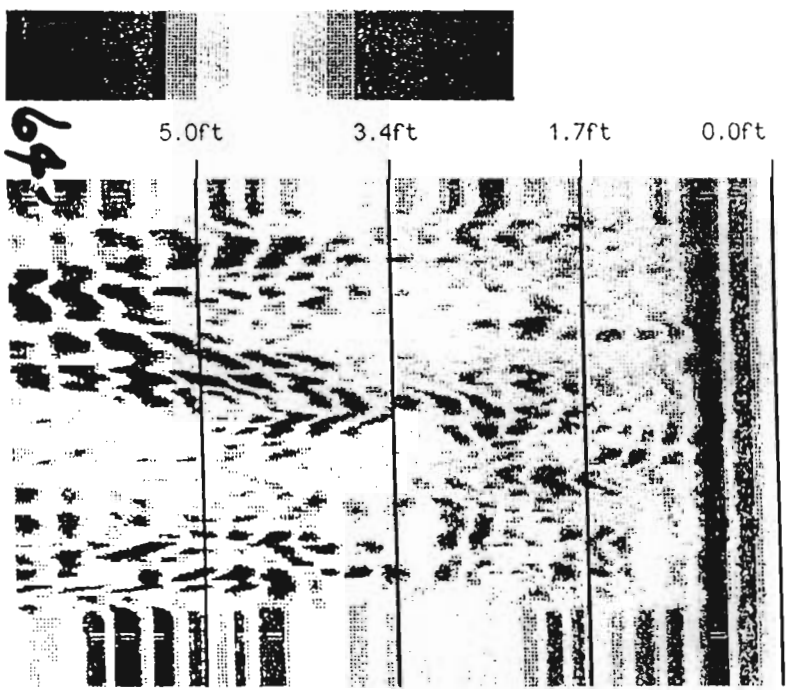
Table #15; Transform #1



FILE240(05/06/02 08:40:48) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

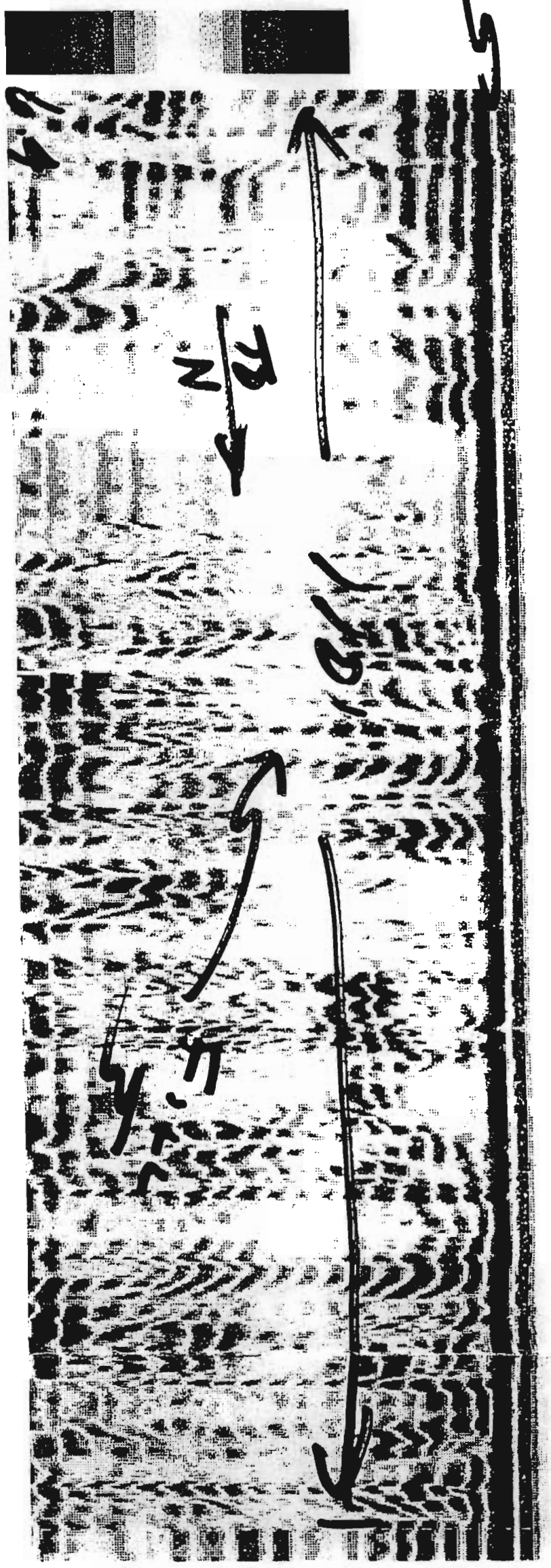
Table #15; Transform #1



FILE237(05/06/02 08:29:02) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

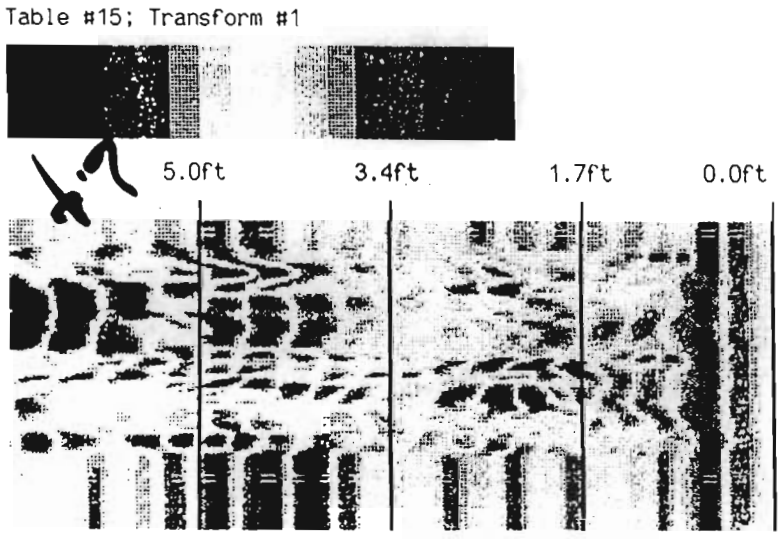
Table #15; Transform #1



FI 3(05/06/02 08:42:12) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

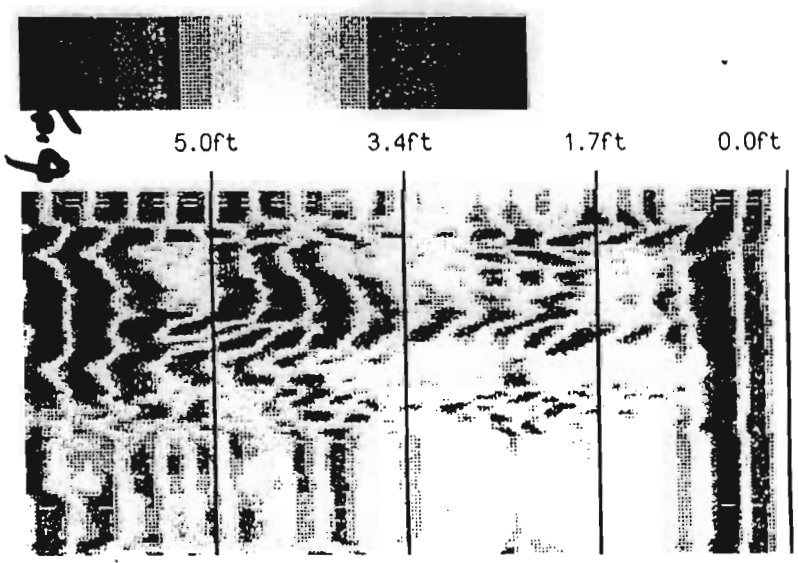
Table #15; Transform #1



FILE241(05/06/02 08:41:22) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

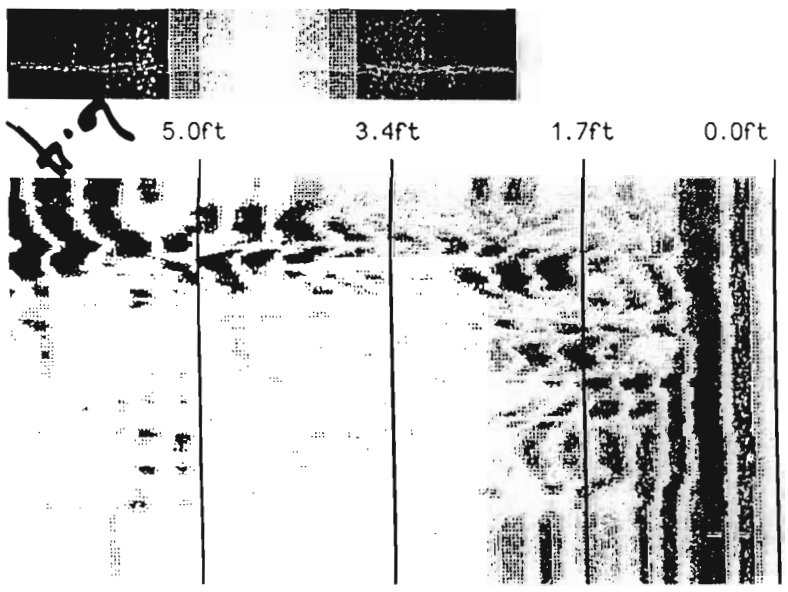
Table #15; Transform #1



FILE244(05/06/02 08:42:34) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

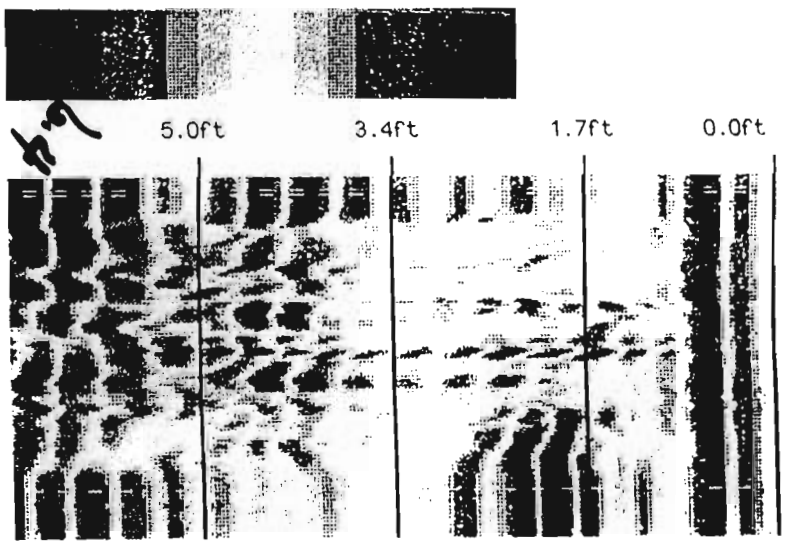
Table #15; Transform #1



FILE242(05/06/02 08:41:48) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

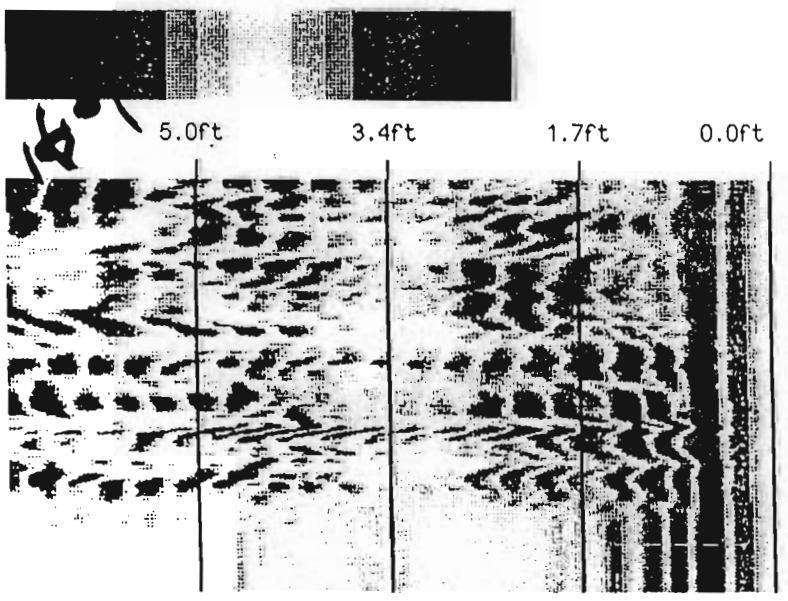
Table #15; Transform #1



FILE245(05/06/02 08:43:04) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 23 44 49
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

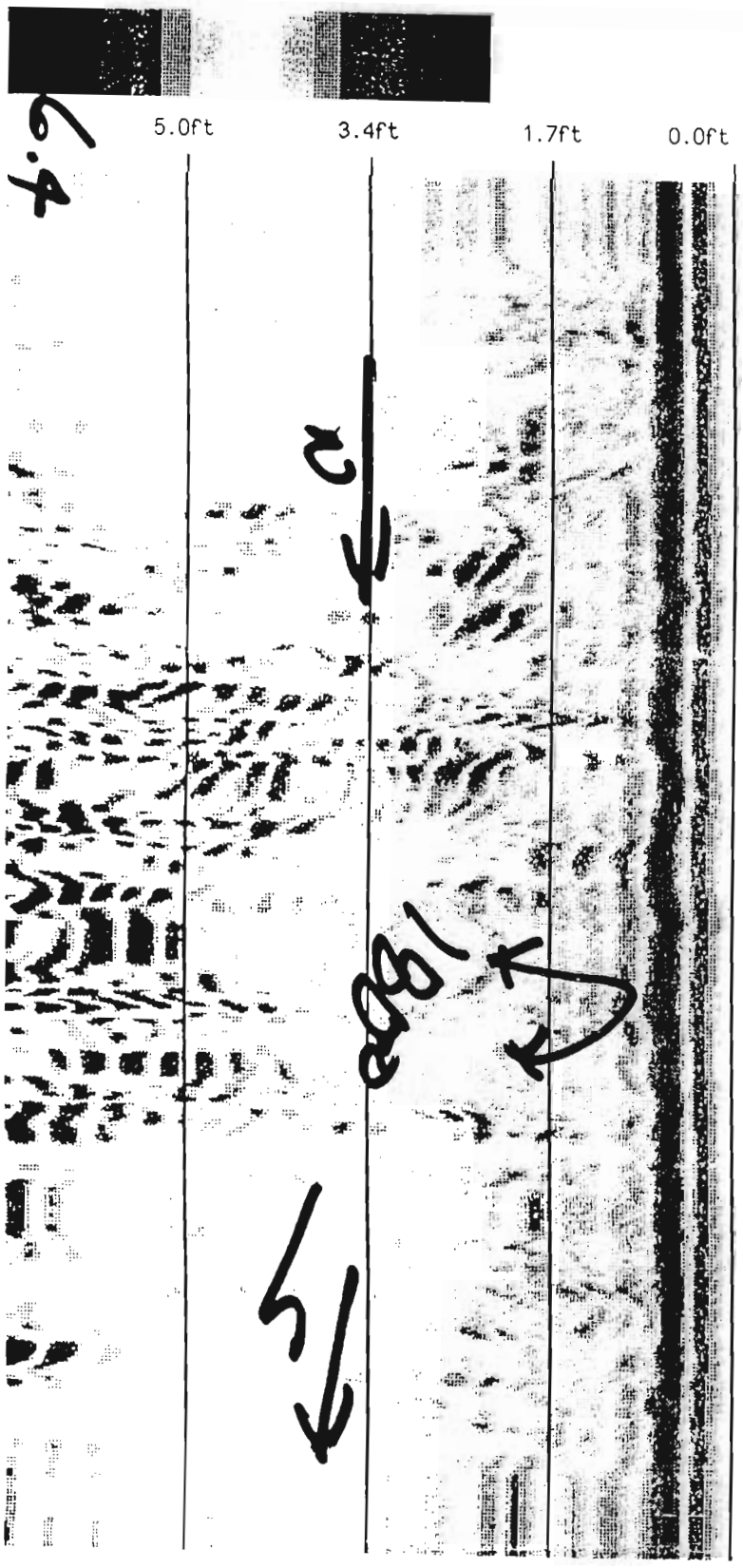
Table #15; Transform #1



FILE250(05/06/02 09:54:12) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 19 30 47
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

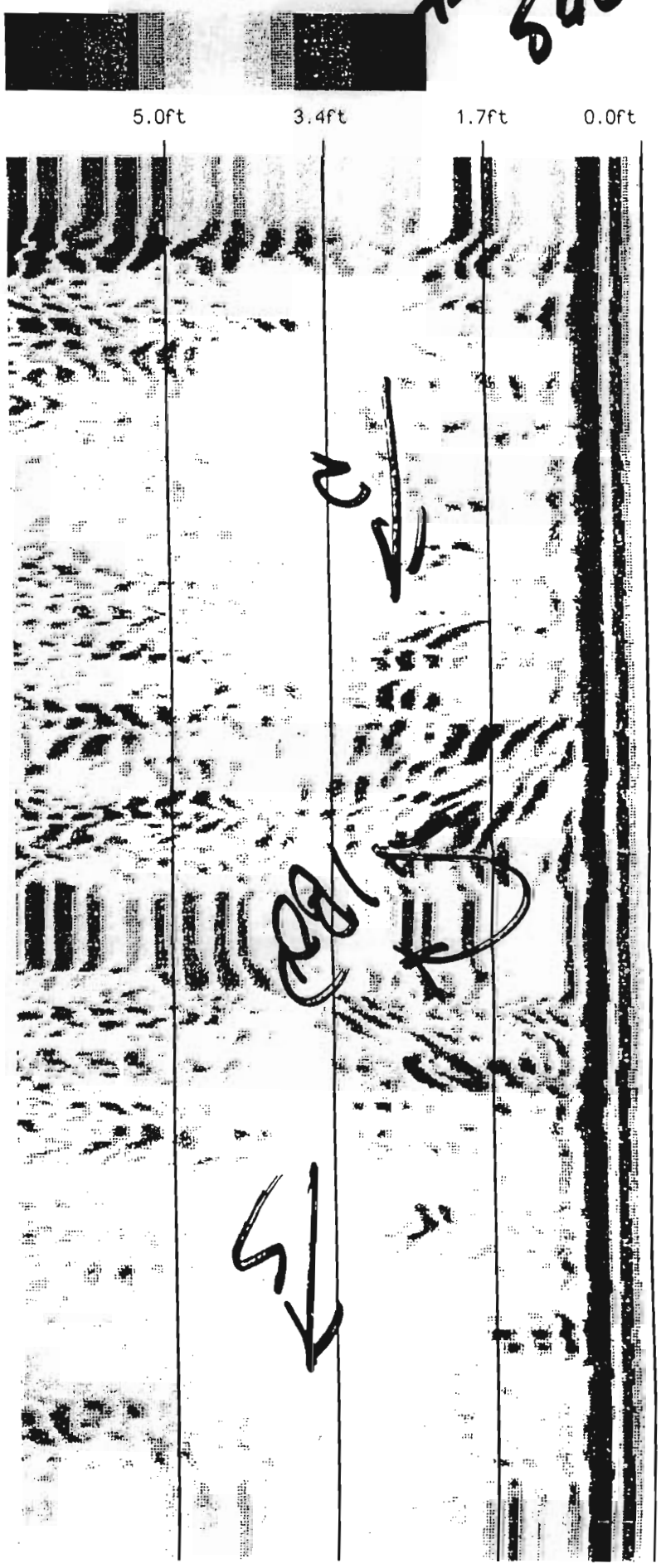
Table #15; Transform #1



FILE249(05/06/02 09:49:42) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 19 30 47
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

Table #15; Transform #1



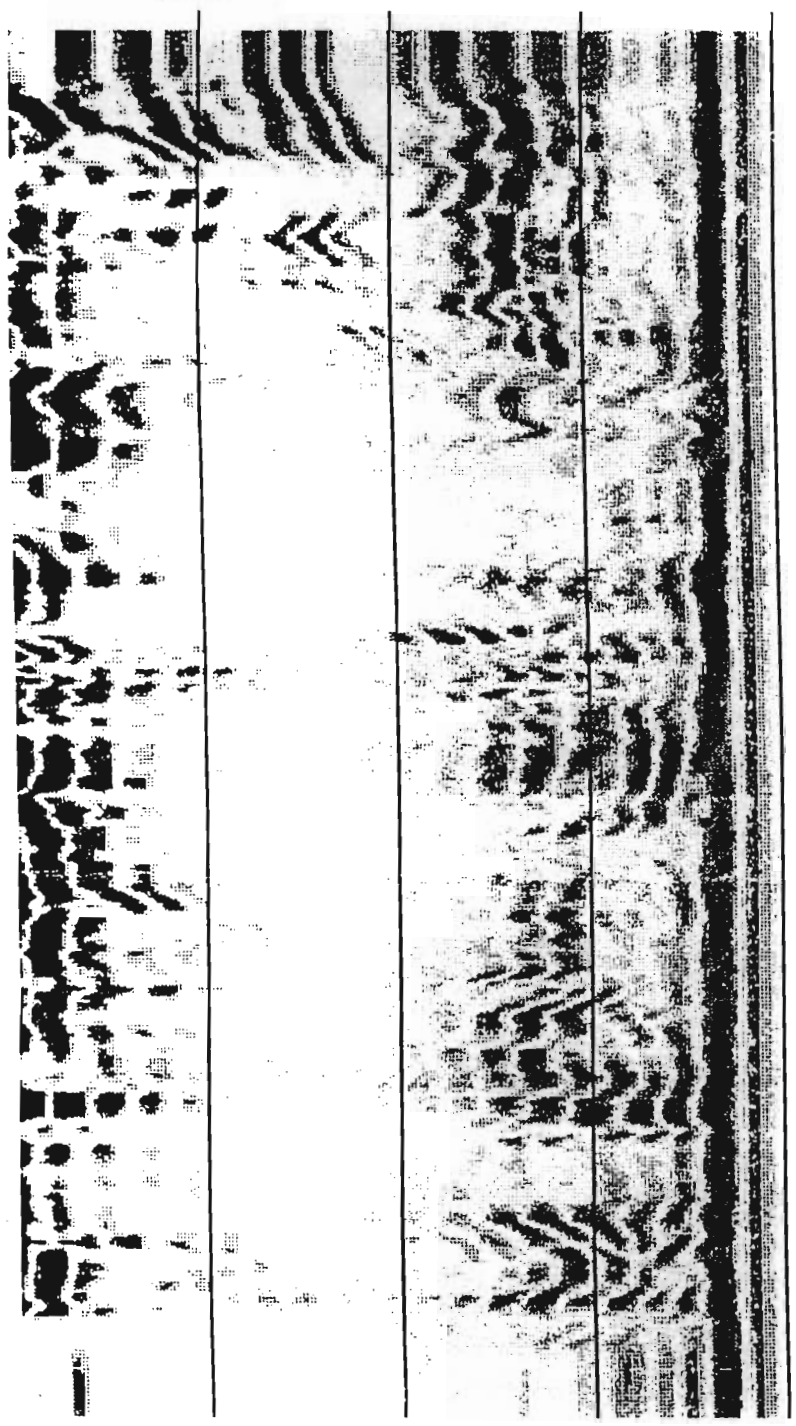
FILE253(05/06/02 10:11:14) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 29 55
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

2.5

Table #15; Transform #1

5.0ft 3.4ft 1.7ft 0.0ft



FILE251(05/06/02 09:56:06) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

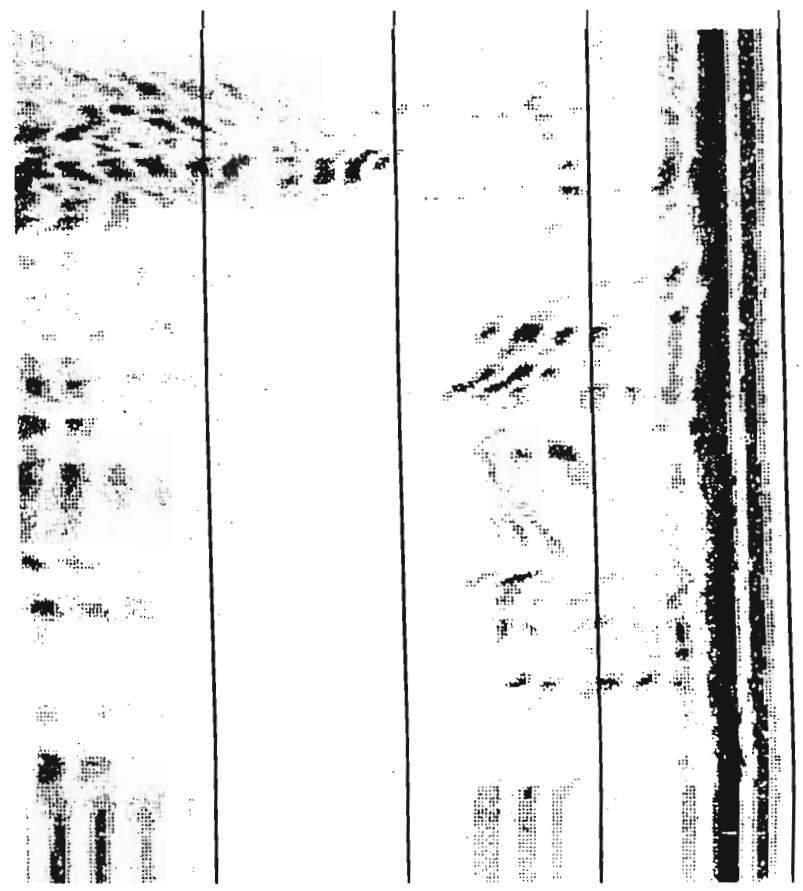
Position: 0.0nS Range: 33.5nS
Range Gain -6 19 30 47
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

2.5

2.5

Table #15; Transform #1

5.0ft 3.4ft 1.7ft 0.0ft



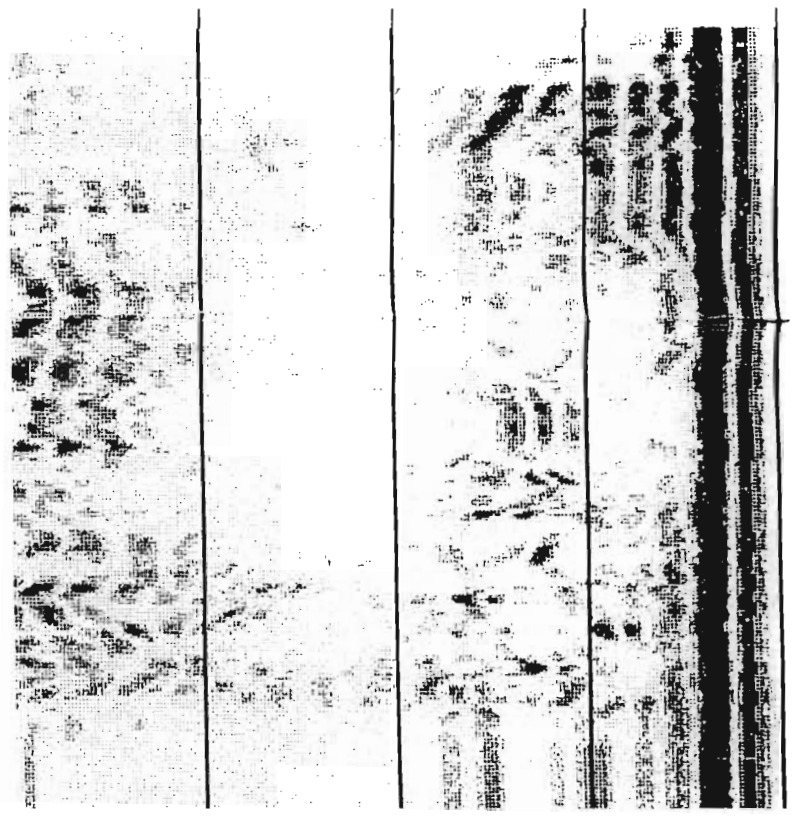
FILE252(05/06/02 09:56:58) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 19 30 47
V(IIR LP N=1 F=955)
V(IIR HP N=2 F=60)
H(IIR STK TC=3)

2.5

Table #15; Transform #1

5.0ft 3.4ft 1.7ft 0.0ft

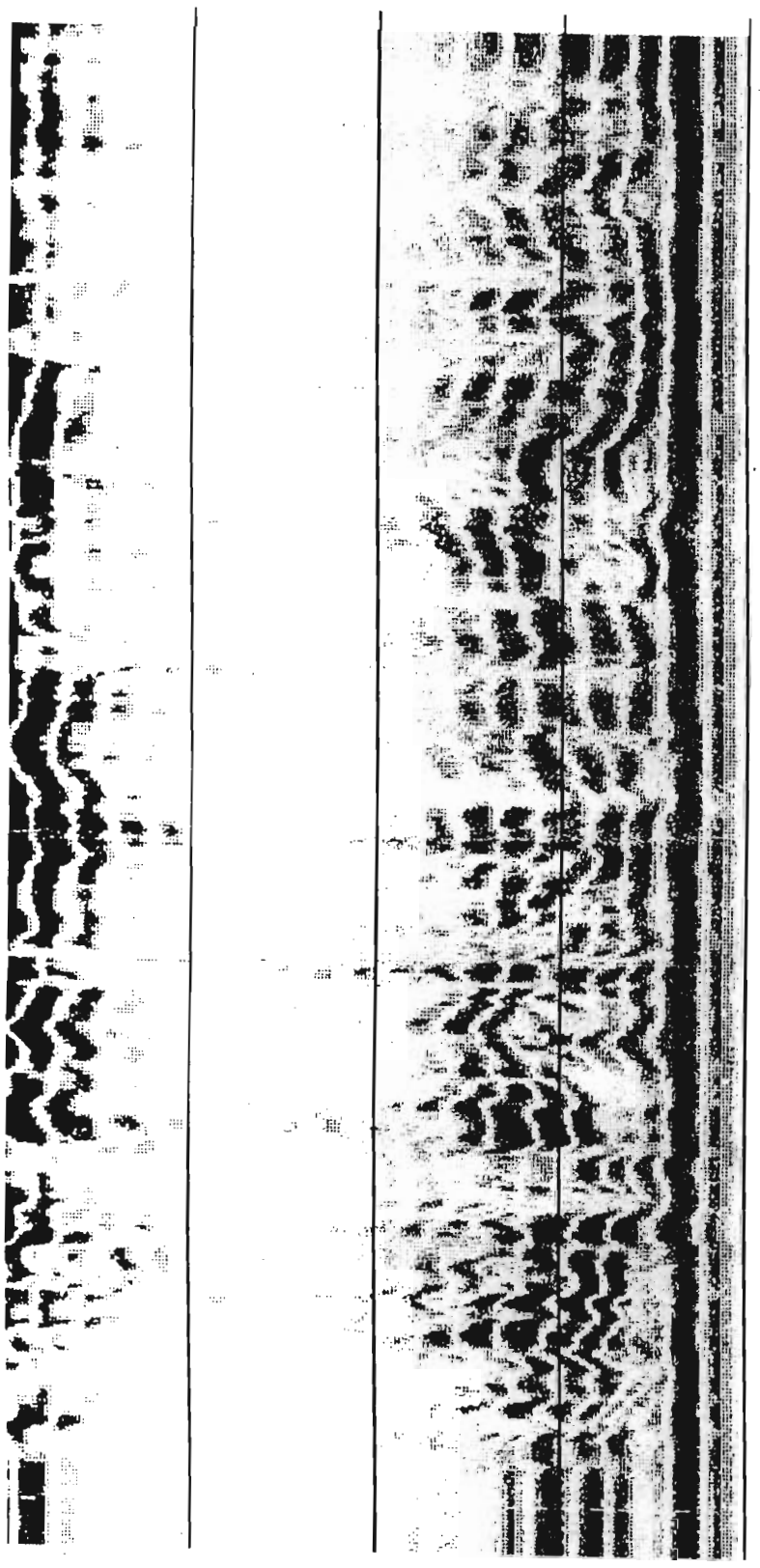


FILE255(05/06/02 10:13:24) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 29 55
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

Table #15; Transform #1

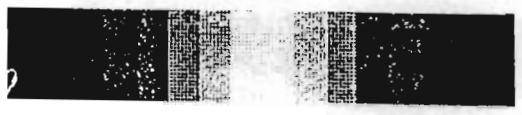
5.0ft 3.4ft 1.7ft 0.0ft



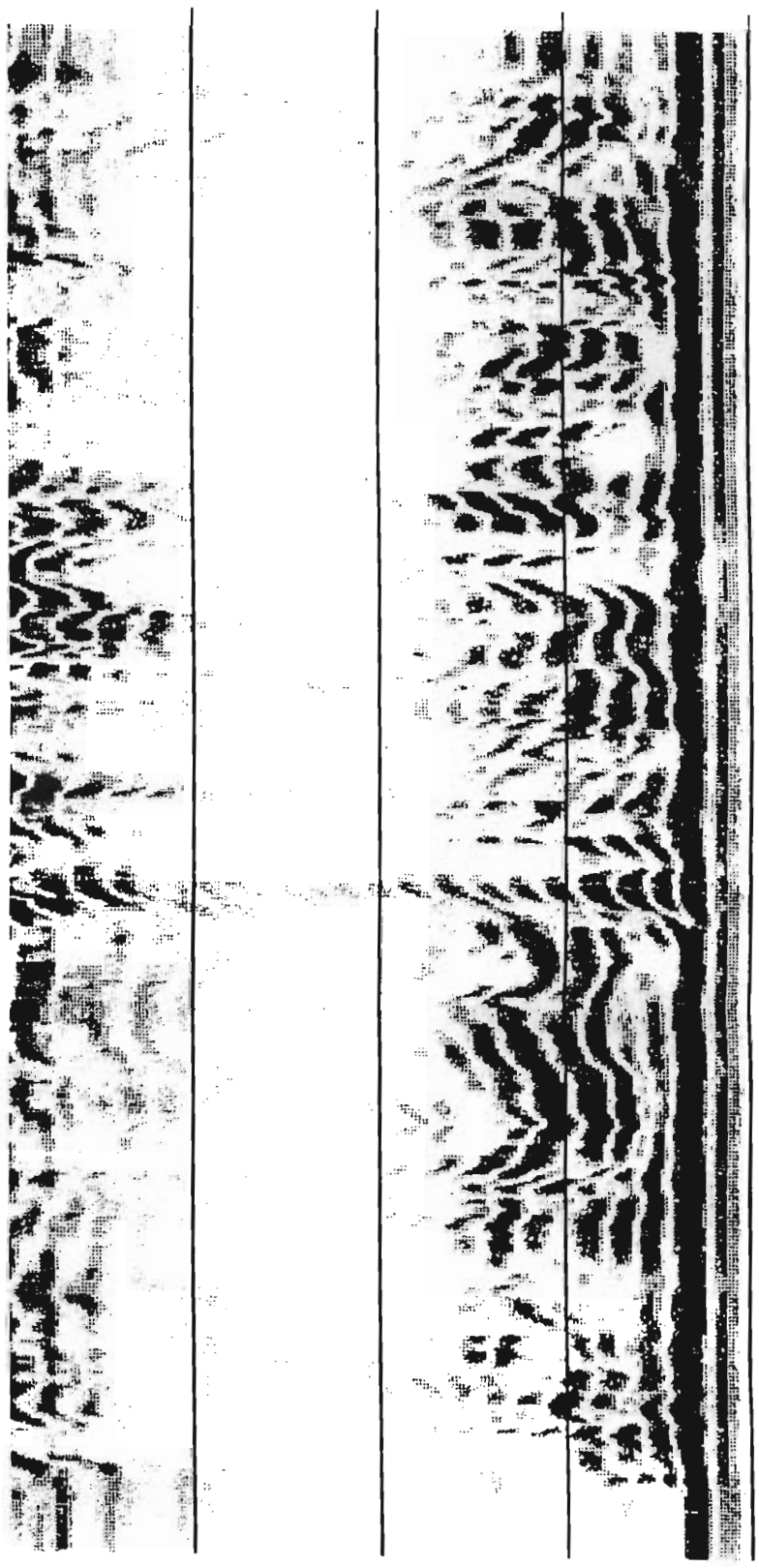
FILE254(05/06/02 10:12:16) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 29 55
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

Table #15; Transform #1



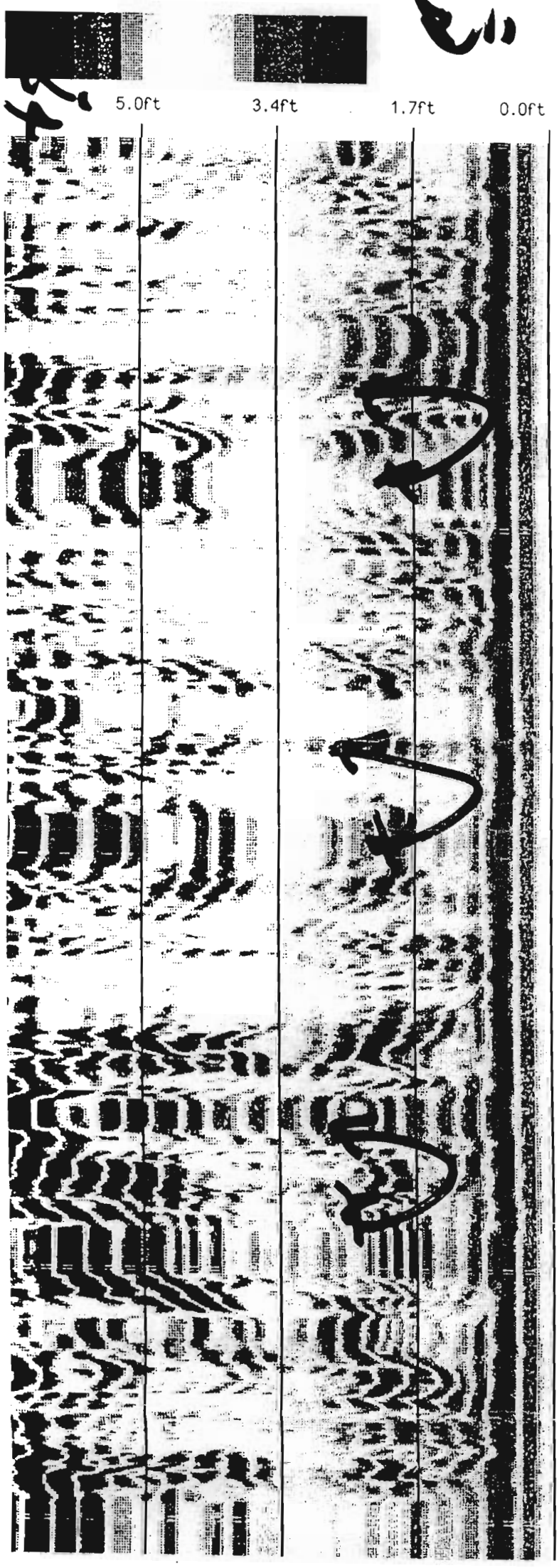
5.0ft 3.4ft 1.7ft 0.0ft



FILE257(05/06/02 10:16:16) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 39 53
V(IIR LP N=1 F=1073)
V(IIR HP N=2 F=67)
H(IIR STK TC=3)

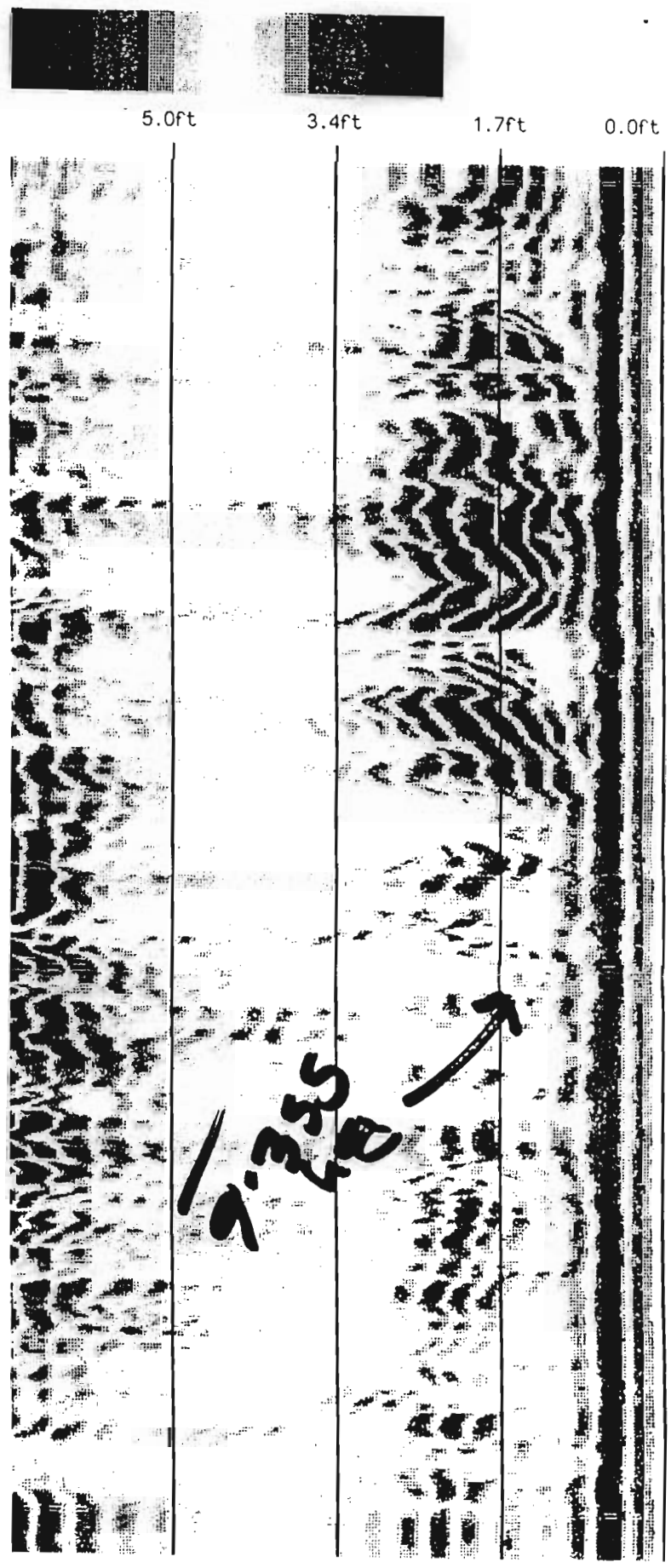
Table #15; Transform #1



FILE256(05/06/02 10:14:48) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 33.5nS
Range Gain -6 22 29 55
V(IIR LP N=1 F=1199)
V(IIR HP N=2 F=75)
H(IIR STK TC=3)

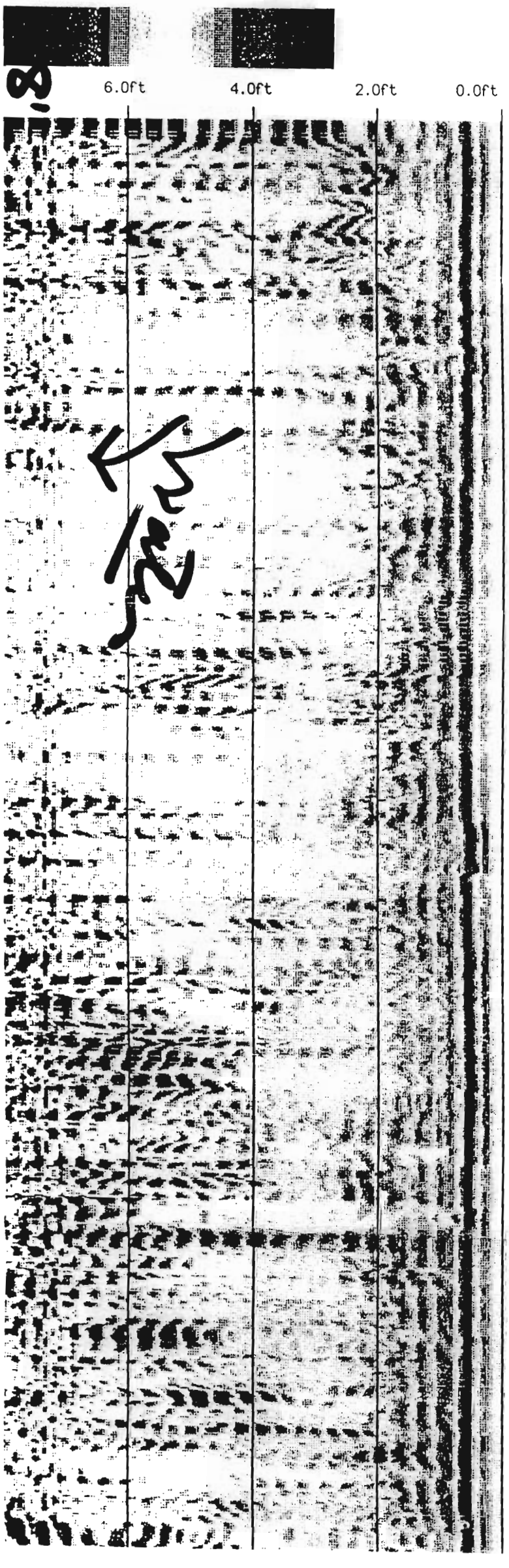
Table #15; Transform #1



05/06/02 12:55:20) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 22 34 53 68
V(IIR LP N=1 F=1365)
V(IIR HP N=2 F=85)
H(IIR STK TC=4)

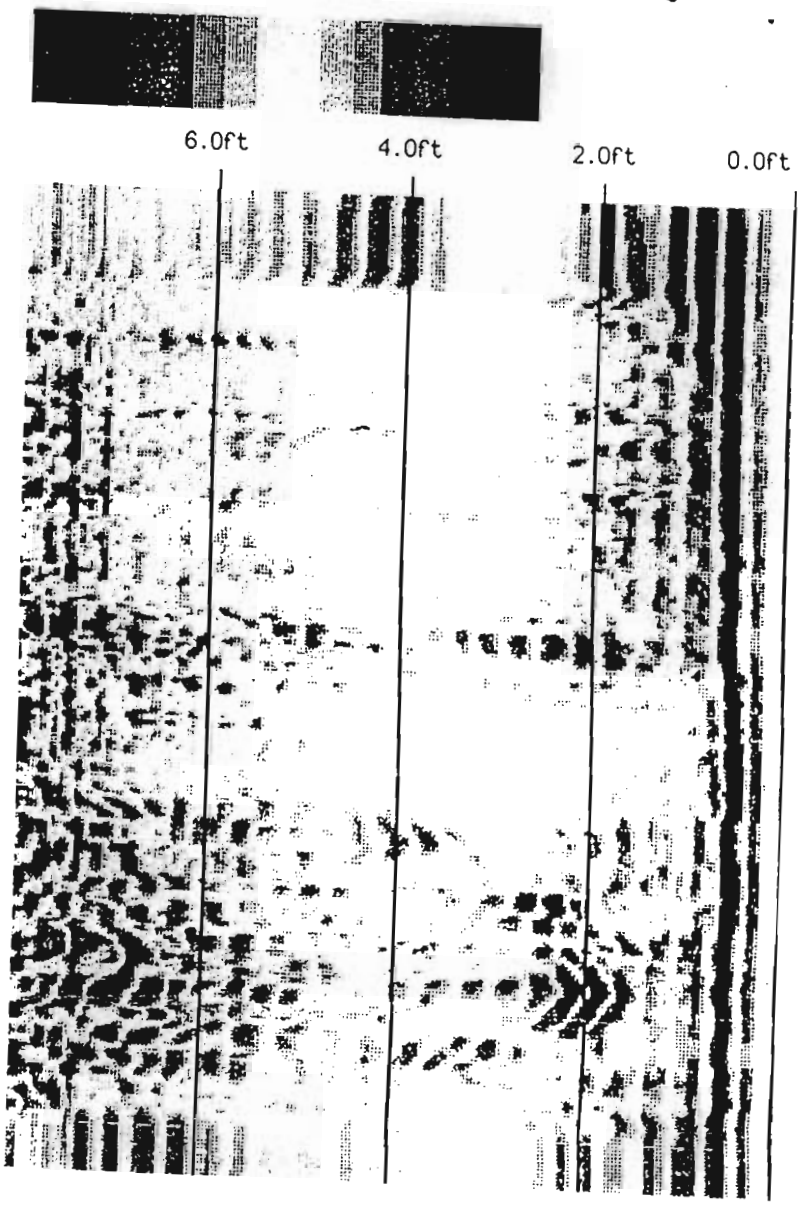
Table #15; Transform #1



FILE290(05/06/02 12:54:02) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 22 34 53 68
V(IIR LP N=1 F=1365)
V(IIR HP N=2 F=85)
H(IIR STK TC=4)

Table #15; Transform #1

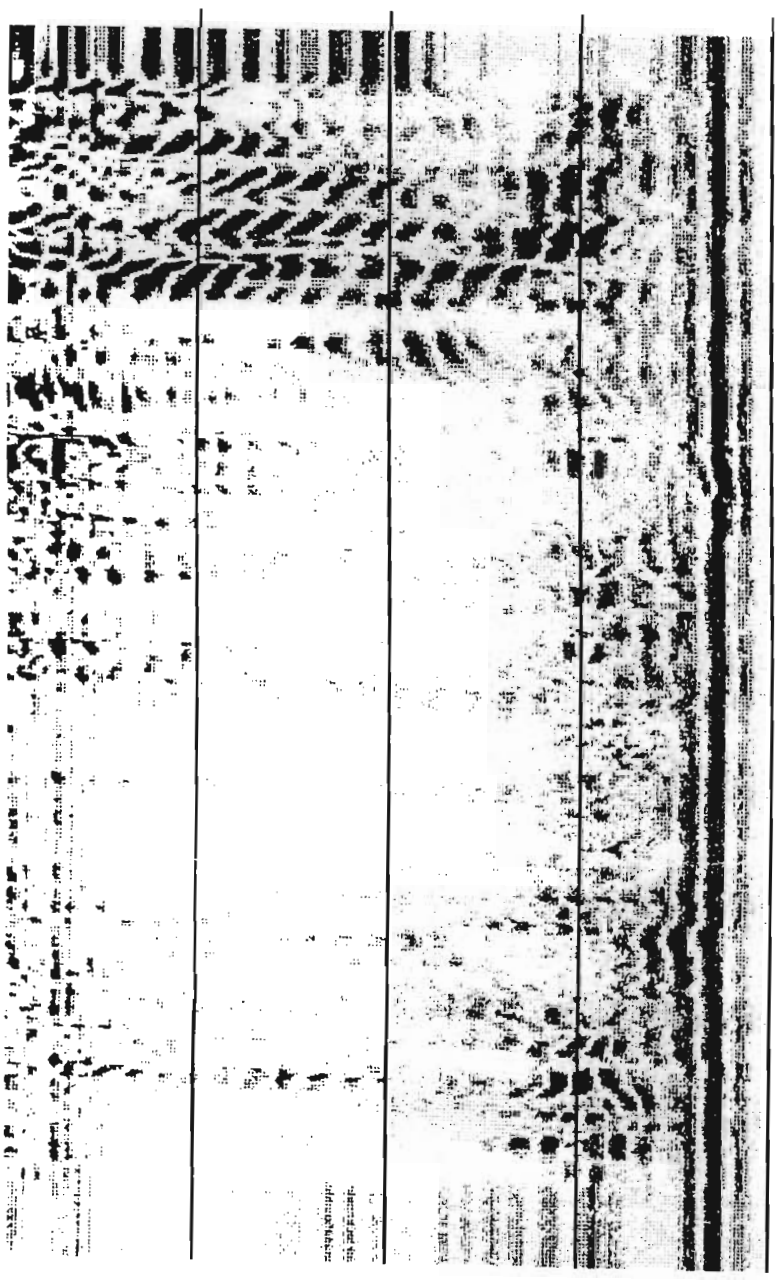


FILE289(05/06/02 12:52:42) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 22 34 53 68
V(IIR LP N=1 F=1365)
V(IIR HP N=2 F=85)
H(IIR STK TC=4)

Table #15; Transform #1

6.0ft 4.0ft 2.0ft 0.0ft

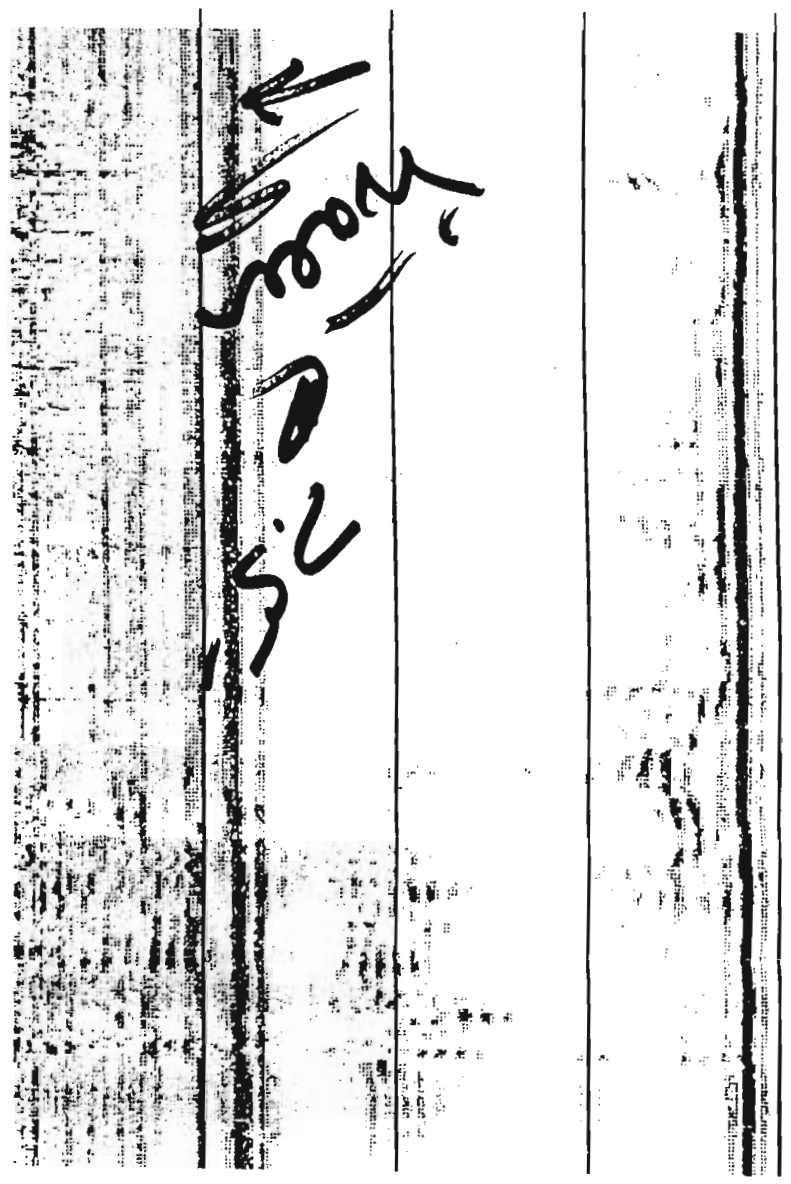


FILE288(05/06/02 12:49:12) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 60.0nS
Range Gain -6 23 52 56 76
V(IIR LP N=1 F=1365)
V(IIR HP N=2 F=85)
H(IIR STK TC=4)

Table #15; Transform #1

9.0ft 6.0ft 3.0ft 0.0ft

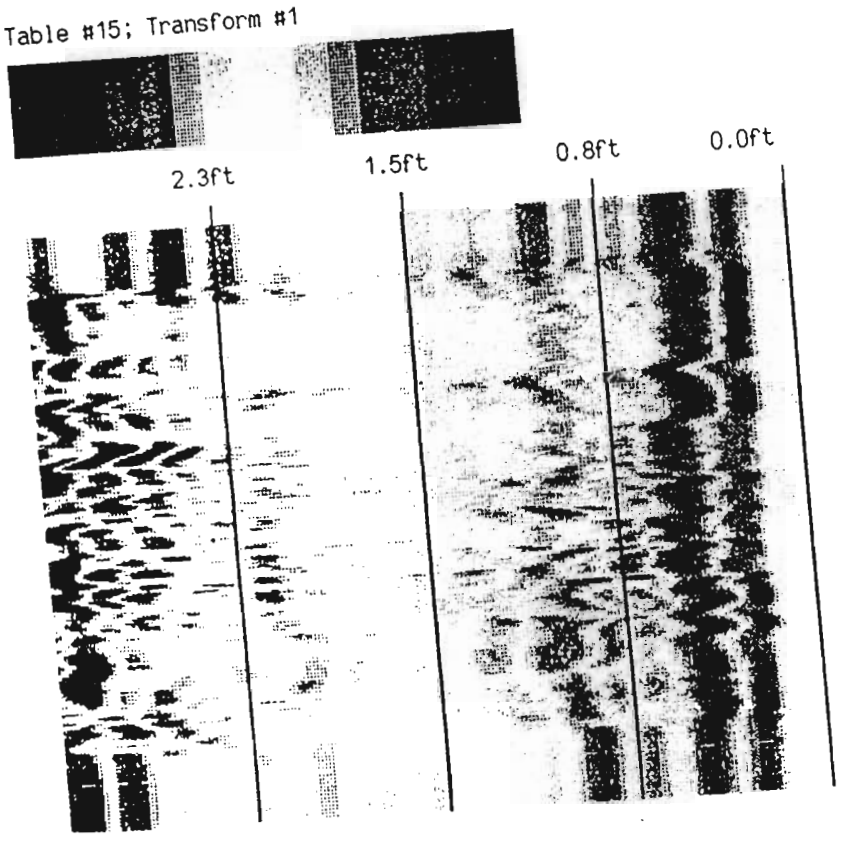


FILE294(05/06/02 13:20:32) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 15.0nS
Range Gain 16 20 37 58
V(IIR LP N=1 F=1339)
V(IIR HP N=2 F=84)
H(IIR STK TC=3)

4.5

Table #15; Transform #1

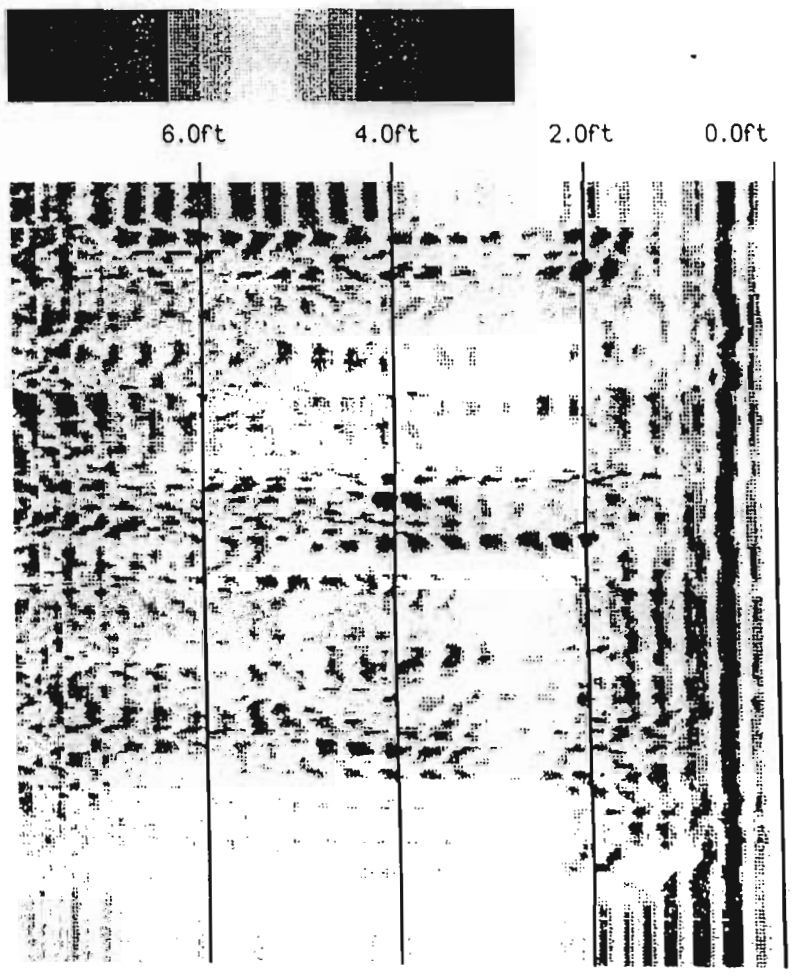


FILE292(05/06/02 13:14:08) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 22 40 53 67
V(IIR LP N=1 F=1365)
V(IIR HP N=2 F=85)
H(IIR STK TC=4)

6.0

Table #15; Transform #1

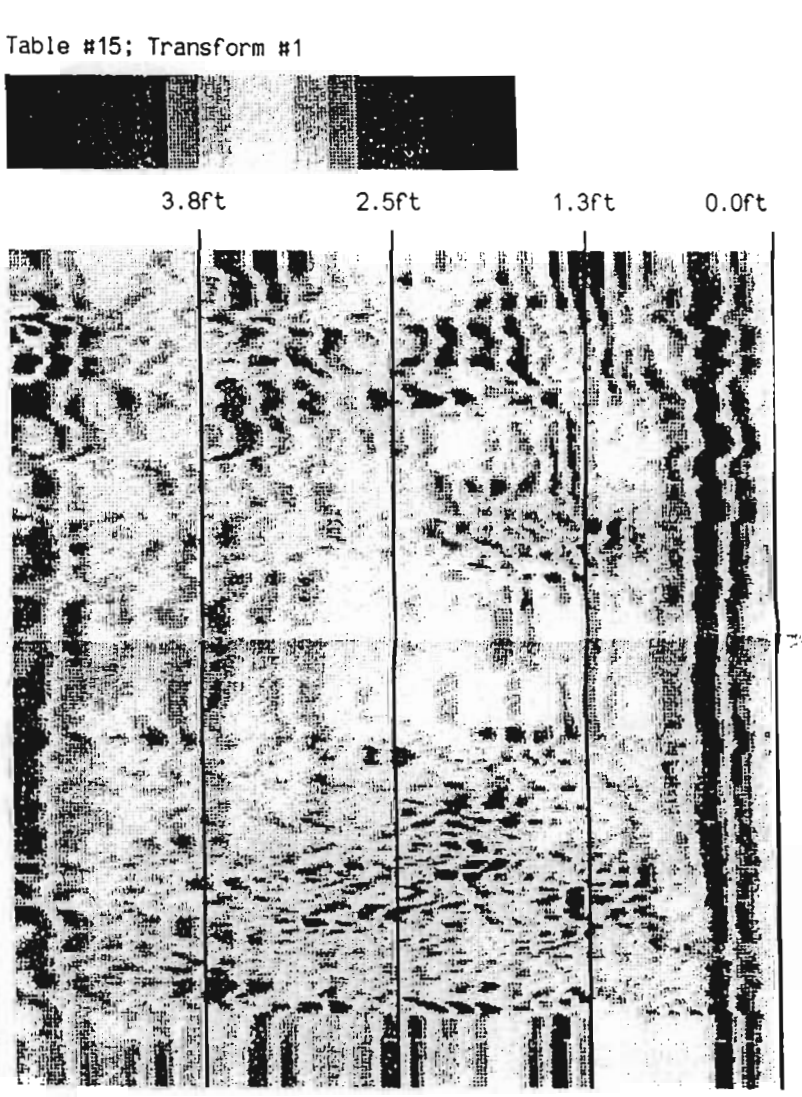


FILE293(05/06/02 13:19:20) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 25.0nS
Range Gain 14 34 49 58
V(IIR LP N=1 F=1437)
V(IIR HP N=2 F=90)
H(IIR STK TC=3)

5

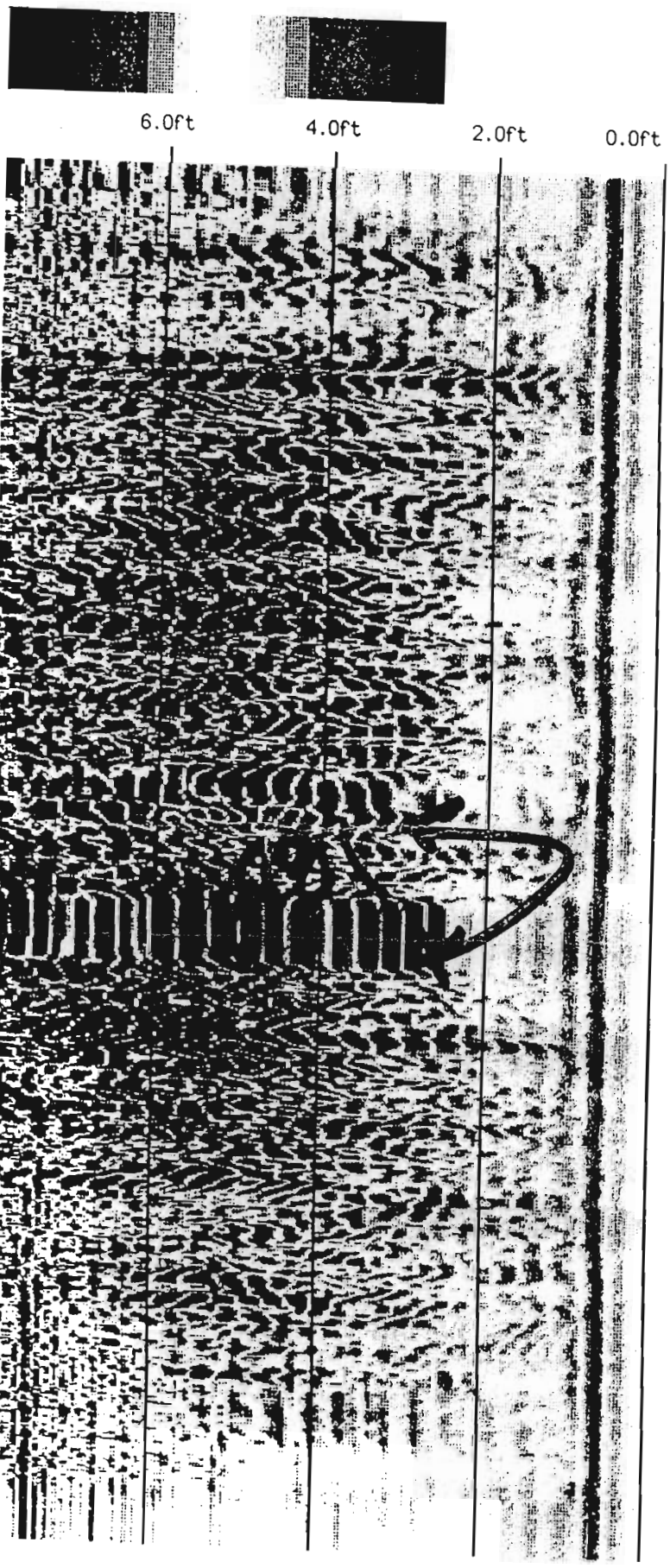
Table #15; Transform #1



FILE296(05/06/02 13:30:36) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 32 64 74
V(IIR LP N=1 F=1219)
V(IIR HP N=2 F=76)
H(IIR STK TC=3)

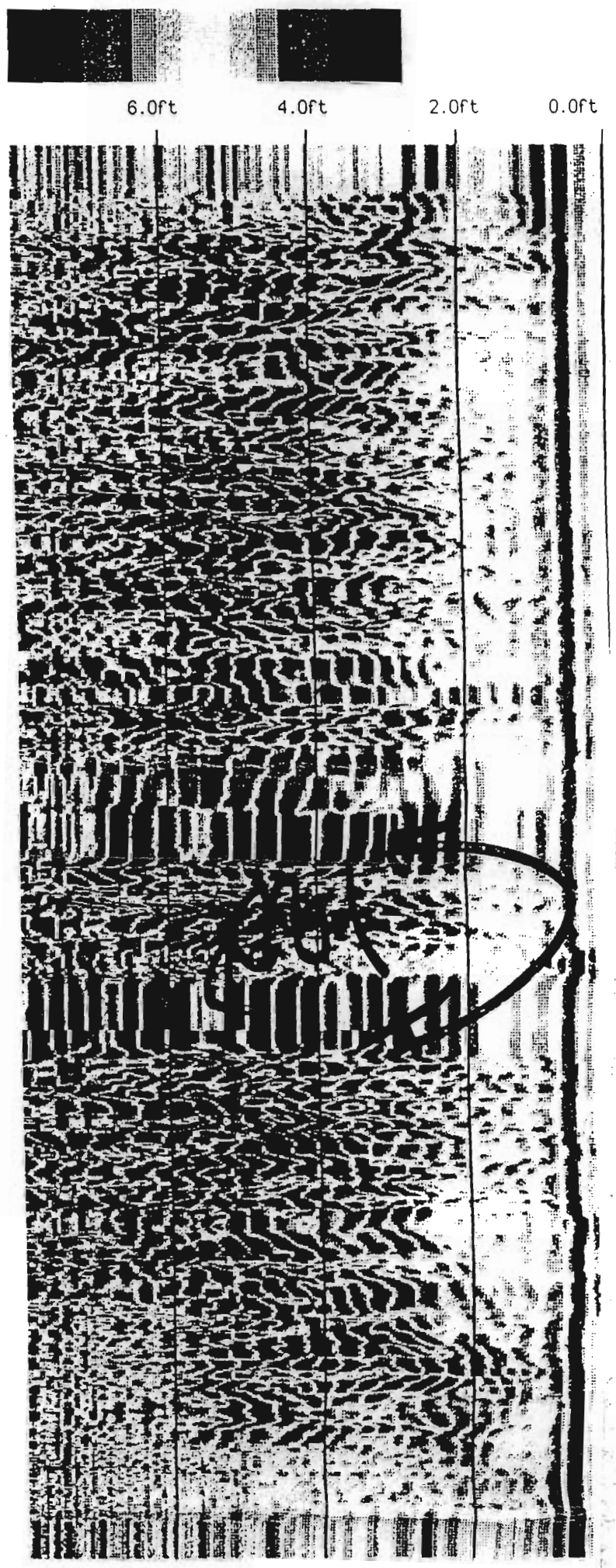
Table #15; Transform #1



FILE295(05/06/02 13:29:00) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 32 64 74
V(IIR LP N=1 F=1219)
V(IIR HP N=2 F=76)
H(IIR STK TC=3)

Table #15; Transform #1

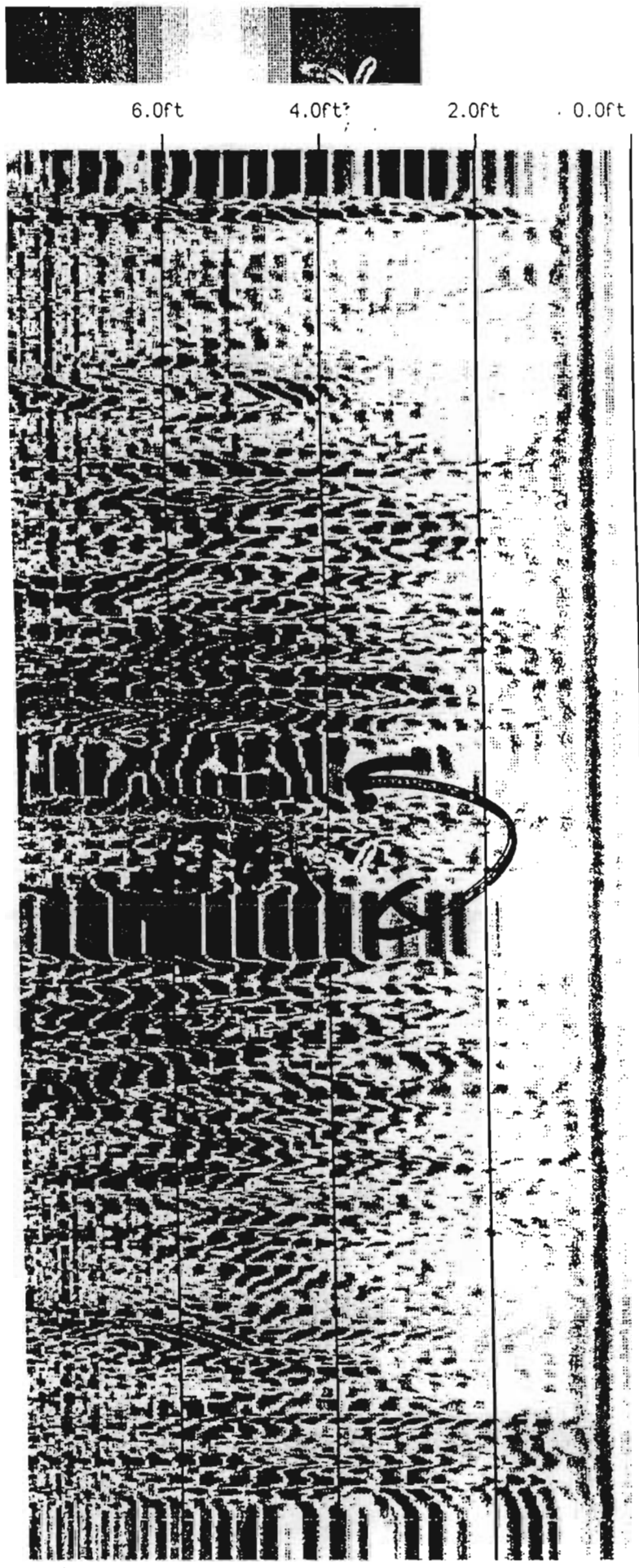


FILE297(05/06/02 13:31:50) Samp/Scan 512
Scan/Sec 32.0 Bits: 8
Dielectric: 6.00

Position: 0.0nS Range: 40.0nS
Range Gain -6 32 64 74
V(IIR LP N=1 F=1219)
V(IIR HP N=2 F=76)
H(IIR STK TC=3)

45

Table #15; Transform #1



5.0 ACQUIRING PROCEDURES

The acquiring of data from the field for the location and orientation of underground storage tanks, utilities, conduits w/in slab, rebar location, grave sites and other specific anomalies has been established by the *ground penetrating radar* for many years. Since 1988, Sub-Surface Information Surveys, Inc. has completed a multitude of successful investigations covering most phases of the *ground penetrating radar* profession. During an investigation, a cross-section of the project will be recorded on the hard drive of our computer. The data is then transferred, copied and duplicated to be made part of this report.

We do not necessarily record every traverse in most of our investigation since most of the information viewed on our monitor is related to the previous traverse. Traverses (I.e., profiles) are monitored on a constant basis. When a traverse is collected on the hard drive, it is also played back in the field for a second look. Where there is an *out-of-place characteristic*, it may be played back a number of times to determine its location and origin. This is recorded on the hard drive for further analyzing at our office. When specific anomalies are located, *all* are documented for reporting. Anomalies are marked in the field if requested to do so. Measurements are taken to identify the exact location such as a tank or utility.

During the start of all surveys, site characteristics and features must be documented to set the standard for that particular site such as soil conditions, conductive features, etc. While the survey is being conducted, there are periodic documentations which are used as a permanent visual comparison to confirm the standard of that site.

After the completion of our survey, it must be reasonably assured that the information is a true cross-section of the project and the information obtained is accurate according to our best professional efforts.

GPR PRINCIPLES
DIELECTRIC CONSTANTS
TWO-WAY SLOWNESS

GROUND PENETRATING RADAR (GPR)...looks like an *X-ray* picture of the ground which is the typical initial impression of the graphic results obtained by radar. GPR, unlike sonic or seismic uses an electromagnetic (radio wave) antenna tuned to a frequency, which can penetrate most soils, rock, concrete, ice and other common natural and manmade materials. Such capabilities make GPR a prime technique to a multitude of tasks.

GPR determines subsurface conditions by sending pulses of high frequency radio waves into the ground from a transmitter antenna located on the surface. Subsurface structures and interfaces cause some of the wave energy to be reflected back to the surface, while the rest of the energy continues to penetrate deeper. A receiver antenna on the surface picks up the reflected wave energy. These signals are then processed and plotted in a distance versus time-depth display. Thus, as the radar antenna is slowly towed across the surface, a continuous cross-section *picture* of the subsurface is generated. The reflections are caused by wave responses at interfaces of materials having different electrical properties. These interfaces include many natural conditions such as bedding, cementation, changes in moisture and clay content, voids etc., as well as man-made objects.

PENETRATION of the radar signal is dependent on the conditions found at each site. Radar waves are attenuated (absorbed or scattered) by certain properties of the site's soil; the most important of which is the *electrical conductivity* of the material. Generally, better overall penetration is achieved in dry sandy soils; reduced penetration is achieved in moist, clayey or conductive soils. Radar penetration is excellent in massive dry materials such as granite, limestone and concrete. The following is a partial list of the approximate *dielectric constants* of certain materials:

MATERIAL	*DIELECTRIC/C*	**TSm (ns/ft)*	**TSm (ns/m)*
AIR	1	2	6.5
FRESH WATER	81	18	59
SEA WATER	81	18	59
SAND-DRY	4-6	4.5	15
SAND-SATURATED	30	11	36
SILT-SATURATED	10	6	20
CLAY-SATURATED	8-12	6	20
DRY SANDY COASTAL LAND	10	6	20
MARSHY FORESTED FLAT LAND	12	7	23
RICH AGRICULTURAL LAND	15	8	26
PASTORAL LAND, HILLY	13	7	23
FRESH WATER ICE	4	4	13
PERMAFROST	4-8	5	16
GRANITE (DRY)	5	4.5	15
LIMESTONE (DRY)	7-9	5	16
DOLOMITE	7-8	2.5	8
QUARTZ	4	4	13
COAL	4-5	4	13
CONCRETE	6	5	16
ASPHALT	3-5	4-5	13-16
SEA ICE	4-12	4-7	13-23
PVC, EPOXY, VINYL POLYESTERS, RUBBER	3	4	13

TSm = Two Way Slowness

Compliments of
Sub-Surface Informational Surveys, Inc.
E. Longmeadow, MA 01028-0452

REPORT NOTES

DATE _____

DATE:_____

DATE: _____

DATE: _____

DATE: _____

EXHIBIT 3

FISH AND WILDLIFE IMPACT ANALYSIS REPORT

January 30, 2002

FISH & WILDLIFE IMPACT ASSESSMENT (Step I and Step II) Environmental Restoration Project Clean Water/Clean Air Bond Act of 1996 Independent Leather 321-333 South Main Street City of Gloversville Fulton County, New York

Prepared for:
CITY OF GLOVERSVILLE
CITY HALL
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Gloversville, New York 12078

Prepared by:

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FISH AND WILDLIFE IMPACT ASSESSMENT
ENVIRONMENTAL RESTORATION PROJECT
DRAFT SITE INVESTIGATION REPORT
INDEPENDENT LEATHER
321-333 SOUTH MAIN STREET, GLOVERSVILLE, NEW YORK

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FIGURES

APPENDICES

1.0 INTRODUCTION

Steps I and II of a New York State Department of Environmental Conservation (NYSDEC) Fish and Wildlife Impact Assessment (FWIA) (NYSDEC, 1994) were completed by C.T. Male Associates, P.C. (CT Male) for the property (or site) formerly known as the Independent Leather site. The site is currently owned by the City of Gloversville, Fulton County, New York (refer to Figure 1, Site Location Map).

Information presented herein summarizes site characterization activities conducted to date at the Independent Leather site. Refer to the Site Investigation (SI) Report for more detailed information regarding waste disposal practices and the extent of environmental media contamination.

The overall objective of this FWIA is to assess the effect that contaminants from the subject site may pose on fish and wildlife resources. The specific objectives of Step I are to identify the fish and wildlife resources, land-use and habitat types that exist in the vicinity of the subject site, and to provide information necessary for the design of the SI. In addition, fish and wildlife species that may utilize habitats that could potentially be impacted by site-related contaminants are identified. This information is necessary to allow identification of potential pathways of contaminant migration into and through fish and wildlife resources.

2.0 NYSDEC FWIA STEP I

The Step I analysis was originally conducted on April 23, 2002, following the EPA investigative activities of the site and assisted with the determination of the media samples collected by C.T. Male.

2.1 Site Description

The Independent Leather site is located at 321-333 South Main Street in the City of Gloversville, County of Fulton, New York. The site boundaries lie within the northeast quadrant of the intersection of South Main Street and Hill Street. The site is identified on City of Gloversville tax maps as being within the parcel with section 149.13, block 2 and parcel 9. The parcel is approximately 3.7 acres in size. The subject site can be accessed by South Main Street and Hill Street (refer to Figure 1, Site Location Map).

The site is situated in the middle of a commercial/retail area in the City of Gloversville. The site is bound to the west by South Main Street; to the east by former railroad tracks that are now a bike path with a wooded area and Callanan Gravel Pit on the other side of the bike path; to the north by a car wash; and to the south by commercial/retail businesses and Hill Street.

The site's property boundaries create an irregularly shaped parcel. The site was formerly a tannery complex. The Cayadutta Creek flows onto the site from the north and continues on a southerly flow through the center of the parcel. At its peak, the site contained four separate buildings, which were associated with the tannery process, and a sewage treatment plant. These buildings were located on both sides of the stream with wooden bridges over the stream allowing access to each side of the stream. The main building complex (two buildings) was located in the western section of the parcel, which was razed as part of the EPA's era. The other two buildings are located in the northeastern portion of the parcel, the smaller of which was also razed by EPA

The Cayadutta Creek flows through the center of the Independent Leather site. The Cayadutta Creek enters the site from the north and continues southerly off the Independent Leather site. The stream substrate consists of one (1) inch to six (6) inch sized round rock with sediment deposits along the east bank. The stream banks are constructed of poured concrete walls and the stream is littered with various urban debris (i.e., glass, plastic, fabric, and metal).

The United States Geological Survey Raster Topographical Map (digitized in 1999 and downloaded from Cornell University Geospatial Information Program (CUGIR) on 02/12/02) for the Gloversville and Peck Lake Quadrangles were used as base maps for the provided Figure 1 (Site Location). Orthophotography for the Gloversville and Peck Lake quadrangles were used as a basis for covertype map (refer to Figure 2, Covertype Delineation Map). NYSDEC Freshwater Wetland Maps (Figure 3, NYSDEC Wetlands) and National Wetland Inventory Maps (Figure 4, National Wetland Inventory Maps) were obtained as required by the FWIA guidance in order to identify wetlands within a 2 mile radius of the site.

2.2 Covertype Delineation

In the context of this report, a "covertype" is defined as an area characterized by a distinct pattern of natural (e.g., forest) or cultural (e.g., industrial) land use. Covertypes were field delineated within 0.50 miles of the subject site onto an orthophotographic base map (refer to Figure 2, Covertype Delineation Map). During the field delineation three (3) covertypes were identified using the "Ecological Communities of New York State"(New York Natural Heritage Program, 1990). The three (3) covertypes are: midreach stream, urban, and successional northern hardwood forest. All of the identified covertypes have a secure global and state ranking, indicating that they are not rare ecological communities requiring preservation (Reschke, 1990). A description of each covertype is provided in the following sections.

2.2.1 Midreach Stream

This aquatic community is characterized as a moderate sized midreach stream (Cayadutta Creek) with a moderate gradient and cold water that forms a well defined pattern. The Cayadutta Creek has alternating pools, riffle, and run sections with lateral erosion. A portion of the Cayadutta Creek banks within the project area are composed of concrete with stone inlays. The Cayadutta Creek comprises approximately 5% of the site (10% of the half mile radius area, refer to Figure 2).

2.2.2 Urban

The urban covertype is compiled from two seperate covertypes observed to be Urban Vacant Lot and Urban Exterior Structure. These covertypes are primarily residential, industrial areas and any man made features. The residential areas located along the south western portions of the site are adjacent to South Main Street and Hill Street. East

of the project site is a public walking/bicycle path. Residential properties in the vicinity of the site are typically one-third to one-half acre lots. Vegetation within the urban covertype was observed to be limited to grass, trees, shrubs, and herbaceous vegetation tolerant of urban conditions [i.e., American elm (*Ulmus americana)*, boxelder (*Acer negundo)*]. The urban covertype comprises approximately 95% of the covertypes within the site boundaries (40% of the half mile radius area; refer to Figure 2).

2.2.3 Successional Northern Hardwoods

Successional Northern Hardwoods are areas where vegetation clearing (i.e., farming, logging) has occurred. During the field walkover the following species were observed adjacent to the project site: black cherry (*Prunus serotina),* white pine (*Pinus Strobus*), green ash (*Fraxinus pennslyvanica),* quaking aspen (*Populus tremula*), red-osier dogwood (*Cornus stolonifera*), cranberry viburnum (*Viburnum trilobum*), American elm (*Ulmus americana*) and Japanese honeysuckle (*Lonicera japonica*). These species are commonly found in areas where disturbance has occurred. Approximately 0% of the site (50% of the half mile radius area) is covered by the successional northern hardwood covertype (refer to Figure 2).

2.3 Description of Fish and Wildlife Resources

The objectives of the description of the fish and wildlife resources are to list potential and observed flora and fauna. Literature reviews were conducted to assess fauna habitats within the vicinity of the site to determine potential species usage. Based on field observations and literature reviews wildlife species have been identified in Appendix A (Observed and Potential Wildlife Species).

The overall limiting factors for wildlife usage within the site boundaries is the size of usable habitat. There were no avian nests observed within the covertypes. No distinct signs of wildlife species (i.e., excavated dens, fecal matter) were observed during the walkover on April 23, 2002. However, a hole was observed that may have been made by burrowing animals, but this was dismissed since the hole was located near the stream in a deteriorated section of the concrete stream bank.

2.3.1 Midreach Stream

The Cayadutta Creek is characterized as an aquatic community that is well defined with alternating pools, riffles, and running sections. According to fish survey information

provided by NYSDEC Region 5, Fisheries Unit on April 27, 2001 the Cayadutta Creek was sampled at a point north of Hill Street, which is within the vicinity of the Independent Leather site. The following three fish species were identified (refer to Appendix A) common creek chub (*Rhinichthys atratulus),* white sucker (*Catostomus commersoni)* and brown trout (*Salma trutta*). The Cayadutta Creek is classified by NYSDEC as a Class C stream (refer to Appendix B, Correspondence). A Class C stream indicates that the best use of the stream is for fishing.

Approximately 1,000 feet of the midreach stream covertype is located on the Independent Leather site. The midreach stream covertype within the Independent Leather site is suitable trout habitat. The substrate observed consisted of one (1) to six (6) inch sized stone with assorted debris (i.e., shopping cart, plastic, metal and fabric). The tree canopy was removed by the EPA demolition conducted during the early spring of 2002. These observations indicate that midreach stream covertype located at the site may provide transient fish a place to feed, but the spawning habitat is marginal for many fish species.

Two mallard ducks (Anas platyrhynchos) were observed in the Cayadutta Creek during the field review. Since, both birds were male it is assumed that they were transient birds. The concrete banks and removal of the vegetation along the Cayadutta Creek eliminates the nesting potential for mallard ducks.

2.3.2 Urban (UR)

The urban residential area does provide habitat for some avian, herpetological and mammal species. Wildlife habitat is limited by the food sources and the amount of space in which homerange and breeding territories can be established. The abandoned structures within an urban covertype are generally inhabited with non-native avian species such as the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*) and the rock dove (*Columba livia*). Abandoned buildings provide nesting and perching areas for these species. Many of the native species do not utilize these structures therefore, there is little value for native species.

Herpetological species within urban covertype are limited by the usable breeding and homerange availability. Most herpetological species (with the exception of snakes and turtles) require clean standing water for procreation. Turtle and snakes generally require loose soil to bury their eggs for incubation. The compacted soils and pavement

associated with the urban covertype does not provide the suitable habitat requirements for herpetological species. The value of this covertype resource is limited to occasional transient wildlife observation.

2.3.3 Successional Northern Hardwoods

Successional northern hardwoods can provide habitat for avian, mammalian, and herpetological species (refer to Appendix A). The species that may utilize this community would have habitat needs requiring primary succession with a dominance of saplings structure and shrubby underbrush. During the walkover, signs of white-tailed deer (*Odocileus virginianus*) were not observed, nor are white-tailed deer believed to utilize the site, since there is no usable habitat (i.e., bedding, feeding, breeding area, and cover) within or adjacent to the site. During the walkover a common crow (*Corvus brachyrhynchos*) was observed. Based on the walkover observations the resource value of this covertype is limited to aesthetics.

2.3.4 Value of Resources to Human

In general, fish and wildlife resources within the site boundaries at the present time are valuable to humans for only occasional aesthetic reasons. Wildlife resources are also enjoyed by naturalists who enjoy observations of wildlife during hiking or camping. However, the value of wildlife inhabiting the study area to humans is very limited. Access to Cayadutta Creek is restricted by residential and business properties fences. The Cayadutta Creek is not a public access fishery along this section of the Cayadutta Creek. The property is bound by fences and no trespassing signage. There is no hunting allowed within the City. For these reasons the value of wildlife in the study area for humans is considered to be very low.

2.4 Observations of Study Area Stress

2.4.1 Known Wildlife Stress in Cayadutta Creek

During the field walkover, no dead or sickly animals were observed within the site or surrounding area.

In 1984, NYSDEC reported two (2) individual chemical spills at Independent Leather site (refer to Appendix C, Known Wildlife Mortality). The first reported spill consisting of Nutreen was reported on July 27, 1984 killed between 5,000 to 10,000 fish. This spill

occurred when a municipal sewer waste line became blocked and overflowed into a floor drain which flowed directly into the Cayadutta Creek.

The second reported spill occurred on October 23, 1984 when a leather analine red dye solution surpassed the overflow capacity and drained directly into the Cayadutta Creek via a floor drain. Toxicity of the discharge was stated as being low in a correspondence date October 23, 1984 by Donald Corliss (refer to Appendix C).

2.5 Other Resources

2.5.1 Freshwater Wetlands

Based on a review of the NYSDEC Freshwater Wetlands Maps (refer to Figure 3, NYSDEC Wetlands) in the Gloversville (1984) and Peck Lake (1984) quadrangles, there are twelve NYSDEC wetlands located within a two mile radius of the Independent Leather (Figure 3). These wetlands are listed as PL-13, PL-30, GL-25, GL-27, GL-28, GL-31, Gl-32, GL-51, GL-53, and GL-54. The Independent Leather site does not encompass any mapped NYSDEC regulated wetlands.

The National Wetland Inventory (NWI) Maps (Figure 4) show the Cayadutta Creek within the site boundary. The Cayadutta Creek is classified as R2uBH (riverine, lower perennial, unconsolidated bottom, permanently flooded). There are also several other NWI wetlands located within two miles of the site (refer to Figure 4).

2.5.2 Significant Habitats

No significant habitats occur within the Independent Leather site. C.T. Male contacted the New York State Department of Environmental Conservation, Natural Heritage Program and the United States Fish and Wildlife Service (FWS) on April 25, 2002 requesting a review of threatened, endangered, rare or special concern species (Appendix B, Correspondence). According to species review letters from NYSDEC, May 6, 2002 threatened, endangered, rare, special concern species are not listed in the vicinity of Independent Leather. A letter dated May 3, 2002 from the U.S. Fish and Wildlife Service stated that, "Except for occasional transient individuals, no federal listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project area."

2.6 Applicable Fish and Wildlife Regulatory Criteria

2.6.1 Location-Specific FWRC

Location-specific Fish and Wildlife Regulatory Criteria (FWRC) are qualitative examinations of significant features, protected by state and federal agencies, that might be affected by current conditions at the site. Location-specific FWRC are regulations that apply to freshwater wetlands; regulated streams; navigable waterways; coastal zones; significant fish and wildlife habitats; wild scenic and recreational rivers; and rare endangered or threatened flora and fauna. The Independent Leather site is not effected by tidal movements, therefore the Coastal Zone Management and tidal wetland FWRC were not required. Location-specific FWRC that may be applicable to the site include the following:

- Clean Water Act, 233 U.S. C. 1261 et seq. Sec. 404 regulates the discharge of pollutants into wetlands and other water of the U.S., including dredged or fill materials.

- The Protection of Waters Program (6 NYCRR Part 608,Article 15, Title 5 of the Environmental Conservation Law) protects streams with a classification of C (T) or higher.

- The Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law) and the Freashwater Wetlands Implemented Regulations (6 NYCRR Parts 663 and 664) are designed to protect NYSDEC regulated wetlands. Only wetlands that have been mapped by NYSDEC are regulated.

- Executive Order 11990, Protection of Wetlands. This Order recognized the value of wetlands and directs federal agencies to minimize the degradation, destruction and loss of wetlands.

- Endanger Species Act (87 Statute 884, as amended; 16 U.S.C. 1531 et seq.).

2.6.2 Chemical-Specific Fish and Wildlife Regulatory Criteria

The following regulatory criteria may be applicable:

- NYSDEC, Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality and Guidance Values, June 1998.

- NYSDEC, Water Quality Regulations for Surface Waters and Groundwaters, NYCRR Parts 700-705, June 1998.
- NYSDEC, Technical Guidance for Screening Contaminated Sediments, March 1998.
- NYSDEC, Determination of Soil Cleanup Objectives and Cleanup Levels TAGM 4046 (1994).

3.0 NYSDEC FWIA STEP II

3.1 Objective and Scope

Step II of the FWIA, contaminant-specific impact assessment, is a determination of impact from site related Contaminants of Potential Concern (COPCs) on fish and wildlife resources. If minimal impacts can be demonstrated at this step in the assessment, additional steps need not be taken. The contaminant-specific impact assessment is based on the information presented in Step I and on the characterization and distribution of the various environmental media contaminants as presented in the SI Report. The SI Report should be consulted for more specific information pertaining to COPCs.

3.2 Pathway Analysis

3.2.1 Identification of COPCs

The COPCs for the Independent Leather site were determined based on a comparison of the various environmental media sampling results to applicable screening criteria presented in Section 2.6 of this report. If the maximum media constituent concentration exceeded the applicable screening value as well as background concentrations, that constituent was identified as a COPC for that medium. It should be recognized that evaluation of site data for exceedance of these values is the first step in the screening process. Exceedance of screening values does not, in itself, indicate a risk to wildlife, but is an indication of a need to continue evaluation of potential exposures to those constituents identified in the screening step.

Based on the findings of the SI and analysis of surface and subsurface soil, groundwater, surface water, sediments and building material samples, the contamination at the subject site was determined to be primarily heavy metals, and to a lesser extent volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). A summary of the various media impacts is presented in the following subsections.

3.2.1.1 Groundwater

The analytical results from the eleven monitoring wells located within the project area indicated that three (3) SVOC's (naphthalene pentachlorophenol and phenol) and three

(3) VOC's (benzene, ethylbenzene and xylenes) were above the NYSDEC water quality standard values.

The concentrations of these compounds were relatively low, however since they were found in monitoring wells located in the footprint of the main tannery building, they may be representative of an isolated pocket of residual contamination.

Analytical results also show, seven (7) metals (antimony, arsenic, chromium, iron, magnesium, manganese, and sodium), were detected in groundwater above NYSDEC water quality standards at one or more well locations. The metals that were detected above their NYSDEC water quality standards are antimony at one location, arsenic at seven locations, chromium at one location, iron at thirteen locations, magnesium at two locations, manganese at six locations and sodium at ten locations. Elevated concentrations of arsenic appeared to be concentrated in the area of the secondary tannery building and the storage building. Iron and magnesium concentrations were elevated throughout the entire site, however from past sampling events in the Gloversville area iron concentrations tend to be elevated within the Gloversville area and therefore is not considered a contaminant source. The concentrations of sodium were abnormally high across the eastern sections of the site particularly along the adjoining roadways to the site and beneath the buildings.

3.2.1.2 Stream Surface Water

Based on analytical results for samples collected from the stream, aluminum and iron were detected above NYSDEC surface water quality standards. The concentrations of aluminum and iron were at the highest concentrations at the up-gradient (up-stream) sampling location, and therefore are not considered contaminants of concern relative to past activities at the site.

3.2.1.3 Stream Sediment

Three (3) sediment samples from the Cayadutta Creek are located upstream of the project area, midstream at the center of the project area, and downstream of the project area. The results of this sampling showed detections of six (6) SVOCs (benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenzo(a,h)anthracene and three metals (copper, iron and zinc) were above the NYSDEC TAGM 4046 values and in part above water quality sediment criteria. Concentrations of SVOC's are elevated at the upstream sample location (CS-1).

Considering the relatively low concentrations of the SVOC's and the absence of these SVOC's in surface water, it is determined that these SVOC's do not represent a source of contamination, but rather are from an upgradient sediment source off the site. Copper, iron and zinc concentrations in the sediment, are not abnormally high. It was inferred that these compounds do not represent a source of contamination and may be consistent with local background elevations.

3.2.1.4 Surface Soil

The analysis of eight (8) surface soil samples determined that surface soil sample (SS) showed detection at SS-6, SS-7 and SS-8 beneath the foot print of the main and secondary buildings. Analytical results for SS-6 indicated that two (2) VOCs (ethylbenzene and xylenes), five (5) SVOC's (benzo(a) anthracene, benzo(a)pyrene, chrysene, 2-methylnaphthalene, and naphthalene) and seven (7) metals (arsenic, chromium, copper, iron, mercury, nickel, and zinc) were present above NYSDEC TAGM 4046 values. Analytical results for SS-7 only detected three (3) metals (chromium, iron, and zinc) above NYSDEC TAGM 4046 values.

Analytical results for SS-8 indicated that five (5) SVOC's (benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and dibenzo (a,h)anthracene) and five (5) metal (arsenic, chromium, iron, mercury and zinc) were detected above the NYSDEC TAGM 4046 values.

The concentrations of these compounds were relatively low, but because the three (3) surface sample location are located within the footprint of the buildings may be isolated pockets of residual contamination.

3.2.1.5 Subsurface Soil

Based on the analytical results, elevated concentrations VOCs are located throughout the site, none of which were above the NYSDEC TAGM 4046 values except for Acetone. Acetone is suspected to be a laboratory artifact. SVOC analytical results detected benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, benzo(k)flouranthene, chrysene and dibenzo(a,h,)anthracene above the NYSDEC TAGM 4046 values.

Arsenic, barium, beryllium, cadmium, chromium, copper, iron, mercury, nickel, selenium and zinc were also identified COPCs in surface soil, however, these metals were detected at elevated concentrations primarily in developed or disturbed areas of

the site. Arsenic, barium, cadmium chromium, copper and zinc concentrations were elevated primarily beneath and immediately adjacent to the secondary tannery building and the storage building. Beryllium and iron detections were located throughout the site under the NYSDEC TAGM 4046 Eastern USA Background level. Arsenic chromium, copper, mercury, nickel selenium and zinc were detected at elevated concentrations above recommended cleanup objective values within the vicinity or beneath the main tannery building.

Of the eleven (11) metals detected above NYSDEC guidance values, it has been established that arsenic, chromium and mercury are present within areas of site at elevated concentrations. In addition to these metals, calcium, magnesium and zinc in areas of the site appear to exist at concentrations above site background and Eastern USA soil background levels and therefore are suspect contaminants. There does, however, appear to be a distinct trend in elevated concentrations of arsenic (in comparison to other locations) in surface soils beneath the secondary tannery building in the area of monitoring wells MW-11, MW-12, MW-13 and MW-15.

3.3 Identification of Potential Pathways

3.3.1 Groundwater

Wildlife inhabiting or utilizing the Independent Leather site are not likely to contact groundwater. Groundwater is approximately two (2) to ten (10) feet below grade. Potential dens or burrows are not excavated or inhabited below the water table and wildlife food sources occur above the ground or in shallow soil. The roots of trees may absorb contaminants from the groundwater but no adverse effects (i.e., dead trees, contorted forms, deformed leaves, etc.) were observed on the site.

The groundwater exposure pathway is considered incomplete for the site under current and foreseeable future uses of the site.

3.3.2 Stream Surface Water

Based on analytical results COPC's were detected from an upgradient source. Based on the low habitat value of the site wildlife usage is expected to be minimal. The stream surface water pathway is considered to be incomplete since, the COPC's highest concentrations at the up-gradient (up-stream) sampling location are not considered relative to past activities at the site.

3.3.3 Stream Sediment

Contaminated sediments at the site have the potential for significant effects to benthic species, as well as fish and wildlife that may come in contact with sediments. However, the actual toxicity of the metal compounds may not be accurately represented by the bulk metal sample results alone. Metal toxicity is related to a number of complex factors including the presence of other metals, valence state, redox potential, and organic content. Stream characteristics (i.e., lack of tree canopy, debris in channel, lack of usable habitat by carnivores and herbivores, etc.) at the sampling location do not provide ample habitat for either fish or wildlife species other then transient movements. Bio-accumulation of these metals in the sediment is not anticipated since, the potential exposure for fish or wildlife is expected to be minimal based on the low habitat value of the site, as well as the submerged nature of the sediments.

3.3.4 Surface Soils

COPCs in surface soil occurs in only the urban portions of the site. Exposures to COPCs in surface soils can occur by direct contact to plants and macroinvertebrates, or through the terrestrial food chain to herbivores and consumers of soil macroinvertebrates. Ground birds and small mammals could be exposed to constituents in soils through direct contact, ingestion or through the terrestrial food chain. The site's soil composition is of poor quality and is not likely to be amenable to the viability of a rich and healthy macroinvertabrate food resource. Mobile terrestrial wildlife are extremely unlikely to utilize the study area as a corridor or a transient source because the study area is in a urban area. The lack of a significant wildlife habitat resource at the site indicates that surface soil contaminants are not a significant exposure pathway under present use conditions.

3.3.5 Subsurface Soil

Exposures to COPCs in subsurface soils can occur by direct contact or incidental ingestion to burrowing or nesting small mammals. However, the wildlife habitat quality of the site is considered to be poor with a general lack of wildlife usage. Subsurface soil is not considered a significant exposure pathway under present use conditions. In the future, if excavation activities are proposed, significant soil erosion occurs, or site development is proposed, then potential wildlife exposure pathways may

need to be evaluated or eliminated to ensure that there is no more than minimal wildlife exposure.

4.0 SUMMARY

Steps I and II of a NYSDEC FWIA were completed by C. T. Male for the Independent Leather site within the City of Gloversville, New York.

Step I consisted of a site description, a description of fish and wildlife resources and a description of fish and wildlife resource values, and indicated that potential wildlife resources exist on the site. Step II consisted of a pathway analysis describing the potential exposure of COPCs to fish and wildlife resources.

The former Independent Leather site consists of approximately 3.7 acres of open urban vacant lot with sparse vegetation. The non-urban covertypes on the site are heavily influenced by urbanization. Industrial, commercial and residential areas have eliminated much of the natural habitat in the area and have replaced it with urban wildlife habitats consisting primarily of mowed lawns with trees, paved roads, parking lots, land fills and urban structure exteriors.

The wildlife potentially inhabiting the terrestrial covertypes and the habitat value of each covertype in the vicinity of the study area were qualitatively evaluated based on field observations of physical characteristics. The habitat quality of terrestrial covertypes, resident wildlife species requirements for food sources, home range, breeding requirements and cover were examined and compared to covertype characteristics.

In general, the value of wildlife inhabiting the study area to humans is very limited. Access to the Independent Leather site is restricted by signage, fencing and other features, and there is no hunting allowed within the City of Gloversville. For these reasons the value of wildlife in the study area for humans is considered to be low.

The objective of the Step II pathway analysis was to identify the specific constituents in the environmental media that are present and, therefore, may require further evaluation. The identification of COPCs for the site was based on comparisons of maximum constituent media concentrations to ecologically based screening criteria and background levels. If the maximum media constituent concentration exceeded the screening value as well as background concentrations, the constituent was identified as a COPC for that medium.

Groundwater: There are no pathways for wildlife contamination associated with groundwater.

Stream Water: There are no pathways for wildlife contamination associated with surface water.

Stream Sediment: Under current conditions, the potential exposure for fish and wildlife to sediments is expected to be minimal based primarily on the low detection limits of the site, and the submerged nature of the sediments.

Surface Soils: The lack of any significant wildlife habitat resource at the site indicates that surface soil contaminants are not a significant exposure pathway under present use conditions.

Subsurface Soils: Subsurface soil is not considered a significant exposure pathway under present use conditions.

In conclusion, this fish and wildlife impact assessment demonstrates that under present condition there is no more than a minimal impact to fish and wildlife resources. There are no pathways for wildlife contamination associated with either groundwater or surface water. For sediments and surface soil, based on the lack of any significant fish or wildlife resources at the subject site, no more than minimal impacts to either fish or wildlife have been identified. For subsurface soil, there are no pathways for wildlife contamination.

This completes the fish and wildlife impact assessment for the Independent Leather site. The results of this evaluation indicate that a quantified evaluation is not required under present use conditions. For possible future use conditions, a quantified fish and wildlife evaluation is not recommended provided that site remediation eliminates COPCs in sediment, and prevents surface and subsurface soils containing COPCs from coming into direct contact with wildlife resources.

If new information becomes available pertaining to site environmental contamination that shows higher levels of COPCs than herein identified, the conclusions and recommendations of this fish and wildlife impact assessment should be reconsidered.

5.0 REFERENCES

New York State Amphibian and Reptile Atlas. Internet Web Site. January 2001, http://www.dec.state.ny.us/website/dfwmr/wildlife/herp/index.html

New York State Bird Atlas. Internet Web Site. January 2001, http://www.dec.state.ny.us/website/dfwmr/wildlife/bba/map/index.html

New York State Department of Environmental Conservation. 1994. Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA).

New York State Department of Environmental Conservation. June 1998, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

New York State Department of Environmental Conservation. January 25, 1999. Technical Guidance for Screening Contaminated Sediments.

Reschke, Carol. 1990. Ecological Communities of New York. NYSDEC.

Smith, C. Lavett. 1985. The Inland Fishes of New York State.

FIGURES

MAP REFERENCE

RASTER USGS TOPOGRAPHIC MAPS FOR GLOVERSVILLE AND PECK LAKE QUADRANGLES (DIGITIZED DATE 2/01/1996) WERE DOWNLOADED FROM CUGIR ON 12/2/02.

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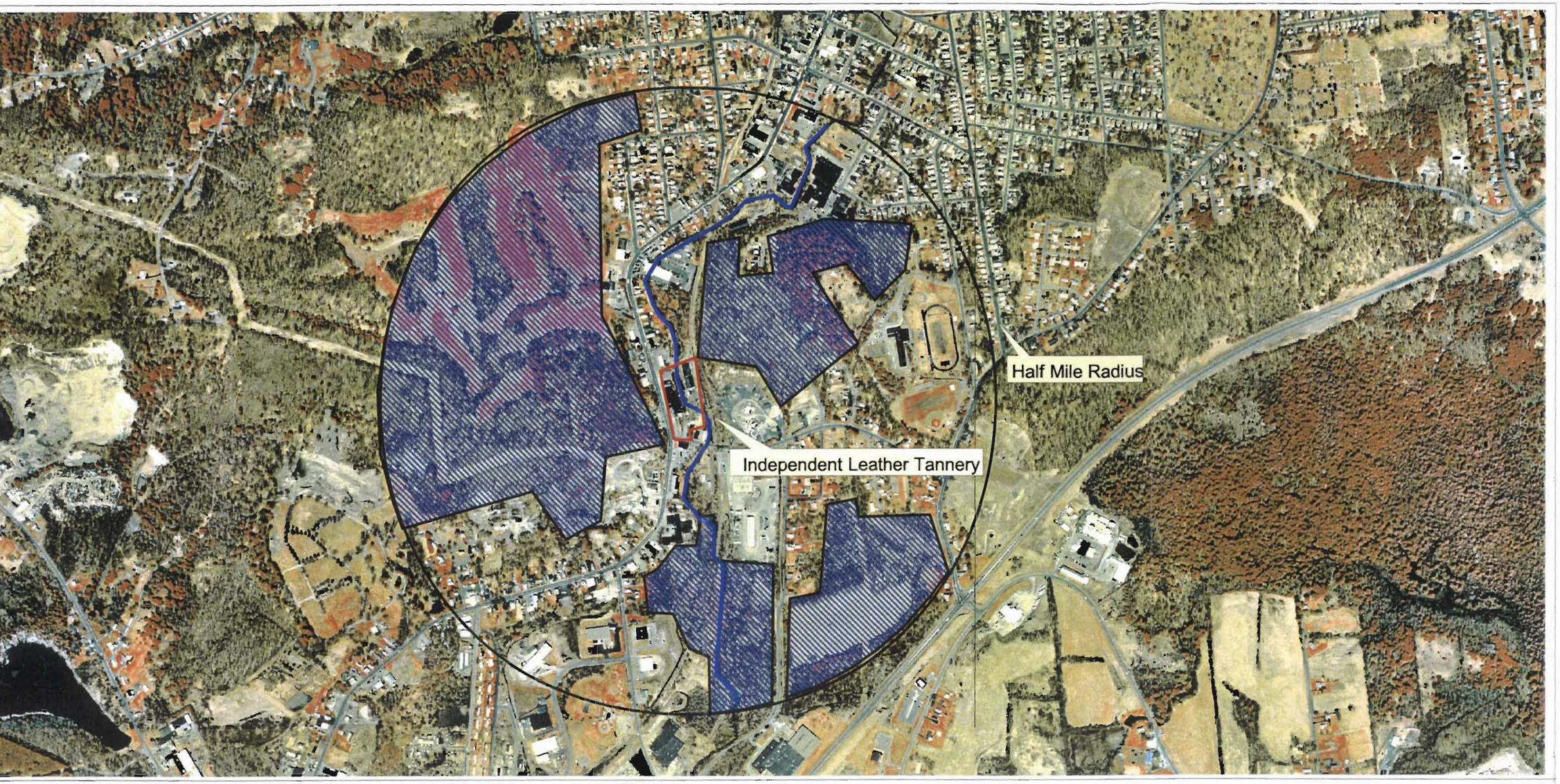
FIGURE 1 SITE LOCATION MAP

INDEPENDENT LEATHER TANNERY

CITY OF GLOVERSVILLE	FULTON COUNTY, NY
SCALE: 1"=2,000'	
DRAFTER: MAK	
PROJECT NO: 01.7293	



1/2-Mile Radius

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ARCHITECTURE &
BUILDING SYSTEMS ENGINEERING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES

N

MAP REFERENCE

ORTHOIMAGERY FOR THE GLOVERSVILLE AND PECK LAKE QUADRANGLES WAS DOWNLOADED FROM THE NYSGIS CLEARINGHOUSE ON 12/2/02.

FIGURE 2
COVERTYPE DELINEATION MAP
Independent Leather Tannery

CITY OF GLOVERSVILLE	FULTON COUNTY, NY

APPENDIX A

OBSERVED AND POTENTIAL FISHERIES INFORMATION

SL SITE LOCATION

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised *23-Mar-01*

ALIAS 1: CAYADUTTA CREEK

SURVEY NUMBER 2: 501029

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060201	1	JOHNSTOWN	FULT	994

BOF MYLAR 9: PECK LAKE

NYTME 10	NYTMN 11	RMI 12
0550594	4761729	7.5

SITE DESCRIPTION 13: UPSTREAM OF WEST MAIN STREET CROSSING - DOWN-STREAM OF TRIB 9e

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060201	2	JOHNSTOWN	FULT	994

BOF MYLAR 9: GLOVERSVILLE

NYTME 10	NYTMN 11	RMI 12
0551415	4762254	8.5

SITE DESCRIPTION 13: IN JOHNSTOWN CEMETERY BEHIND KARG BROTHERS TANNERY - 500 FEET DOWNSTREAM OF TRIB 11a

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060201	3	JOHNSTOWN	FULT	994

BOF MYLAR 9: GLOVERSVILLE

NYTME 10	NYTMN 11	RMI 12
0551699	4763333	9.4

SITE DESCRIPTION 13: UPSTREAM OF TOWNSEND STREET - ≈1500 FEET DOWNSTREAM OF TRIB 12

SL SITE LOCATION

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 23-Mar-01

ALIAS 1: CAYADUTTA CREEK

SURVEY NUMBER 2: 501029

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY 5	COUNTY 6	FILE NUMBER 7
060101	4	JOHNSTOWN	FULT	994

BOF MYLAR 9: GLOVERSVILLE

NYTME 10	NYTMN 11	RMI 12
0552702	4764207	110.3

SITE DESCRIPTION 13: DOWNSTREAM OF HARRISON AVE - ≈1500 FEET UP-STREAM OF TRIB 12a

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY 5	COUNTY 6	FILE NUMBER 7
060201	5	JOHNSTOWN	FULT	994

BOF MYLAR 9: GLOVERSVILLE

NYTME 10	NYTMN 11	RMI 12
0552807	4765216	111.0

SITE DESCRIPTION 13: UPSTREAM OF BULL ST

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY 5	COUNTY 6	FILE NUMBER 7
060201	6	JOHNSTOWN	FULT	994

BOF MYLAR 9: GLOVERSVILLE

NYTME 10	NYTMN 11	RMI 12
0553218	4766096	111.8

SITE DESCRIPTION 13: UPSTREAM OF EAST POINT ST - ≈2000 FEET DOWNSTREAM OF TRIB 13

SL SITE LOCATION

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 23-Mar-01

ALIAS 1: CAYADUTTA CREEK

SURVEY NUMBER 2: 501029

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060101	7	JOHNSTOWN	FULT	994

BOF MYLAR 9	NYTME 10	NYTMN 11	RMI 12
GLOVERSVILLE	0553198	4767574	13.0

SITE DESCRIPTION 13: UPSTREAM OF BLEECKER STREET - AT INTERSTION WITH WEST EIGHTH STREET

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060201	8	JOHNSTOWN	FULT	994

BOF MYLAR 9	NYTME 10	NYTMN 11	RMI 12
GLOVERSVILLE	0552803	4768189	13.7

SITE DESCRIPTION 13: DOWNSTREAM OF UYS RT 309 LOWER CROSSING

DATE (mm/dd/yy) 3	SITE 4	TOWN or CITY* 5	COUNTY 6	FILE NUMBER 7
060201	9	JOHNSTOWN	FULT	994

BOF MYLAR 9	NYTME 10	NYTMN 11	RMI 12
GLOVERSVILLE	0552308	4768640	14.4

SITE DESCRIPTION 13: UPSTREAM OF NYS RT 309 SECOND CROSSING JUST NORTH OF WEST STATE STREET

IFS INDIVIDUAL FISH SHORT

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 07-Mar-01

ALIAS 1: CAYADUTA CREEK

SURVEY NUMBER 2: 501029

DATE (mm/dd/yy) 3: 062001

REP # 5: 1

SITE 4	FISH NUMBER 6	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10
1	1	BT	444		W
1	2		272		S
1	3		181		S
1	4		216		S
1	5		259		S
1	6		165		W
1	7		230		S
1	8		192		W
1	9		190		S
1	10		221		S
1	11	BT	186		S
1	12	GS	86		
2	13	BT	188		S
2	14	BT	166		W
2	15		57		W
2	16		54		W
2	17		54		W
2	18		48		W
2	19		57		W
2	20		57		W
2	21		53		W
2	22		57		W
2	23		56		W
2	24	BT	46		W
2	25	WS	151		
3	26	BT	248		S
3	27	BT	164		S
3	28	BT	215		W
3	29	BT	161		W
3	30	BT	177		W
3	31		192		S
3	32		172		W
3	33		181		W
3	34		179		W
3	35		144		W
3	36		159		W
3	37		58		W
3	38		354		S
3	39		378		S
3	40		313		S
3	41		302		W
3	42		303		S
3	43	BT	452		W
3	44	BNO	72		

IFS INDIVIDUAL FISH SHORT

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 07-Mar-01

ALIAS 1 CAYADUTTA

SURVEY NUMBER 2: 501029

DATE (mm/dd/yy) 3: 062101

REP # 5: 1

SITE 4	FISH NUMBER 6	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10
4	45	BF	55		W
4	46	BT	65		W
4	47		352		W
4	48		180		W
4	49		313		W
4	50		197		W
4	51		176		W
4	52		177		W
4	53		163		W
4	54		194		W
4	55	BT	140		W
5	56	WS	339		
5	57	WS	305		
5	58	CC	67		
5	59	BT	290		S
5	60		225		S
5	61		253		W
5	62		178		W
5	63		148		W
5	64		166		W
5	65		217		W
5	66		225		W
5	67		135		W
5	68		219		W
5	69		211		W
5	70	DT	145		W
5	71		147		W
5	72		162		W
5	73		136		W
5	74		136		W
5	75		164		W
5	76		157		W
5	77		132		W
5	78		132		W
5	79		125		W
6	80		315		W
6	81		210		W
6	82		177		W
6	83		218		W
6	84		222		W
6	85		171		W
6	86		189		W
6	87		146		W
6	88		126		W
6	89		135		W
6	90		142		W
6	91		150		W
6	92	BT	114		W

IFS INDIVIDUAL FISH SHORT

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 07-Mar-01

ALIAS 1 CANADAIGUA CREEK

SURVEY NUMBER 2: 5 2 1 6 2 9

DATE (mm/dd/yy) 3: 0 6 2 1 0 1

REP # 5: 1

SITE 4	FISH NUMBER 5	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10
7	93	BT	318		R
7	94		270		S
7	95		257		W
7	96		280		S
7	97		136		S
7	98		130		W
7	99		50		W
7	100	BT	33		W

SITE 4	FISH NUMBER 5	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10

IFS INDIVIDUAL FISH SHORT

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 07-Mar-01

ALIAS 1 CAYANUTTA CREEK

SURVEY NUMBER 2: 5 0 1 0 2 9

DATE (mm/dd/yy) 3: 0 6 2 2 0 1

REP # 5: 1

SITE 4	FISH NUMBER 5	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10
8	101	BT	310		S
8	102		39		W
8	103		45		W
8	104		42		W
8	105		48		W
8	106		52		W
8	107	BT	44		W
8	108	BB	122		
9	109	CC	132		
9	110	BT	225		W
9	111		166		W
9	112		216		W
9	113		152		W
9	114		165		W
9	115		149		W
9	116		148		W
9	117		154		W
9	118		174		W
9	119		169		W
9	120		165		W
9	121	BT	156		W

SITE 4	FISH NUMBER 5	SPECIES CODE 7	LENGTH (mm) 8	WEIGHT (g) 9	WILD 10

BF

BULK FISH

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 23-Mar-01

ALIAS 1 CAYADUTTA CREEK

SURVEY NUMBER 2: 5 0 1 0 2 9

DATE (mm/dd/yy) 3	SITE 4	REP # 5	SPECIES CODE 6	# OF FISH 7	C/O	LENGTH MIN(mm) 9	LENGTH MAX(mm) 10	WEIGHT (g) 11	STAGE 12	MESH 13
062001	1	1	BND	402 57	C	55	79			.
	1	1	LND	403 39	C	69	98			.
	2	1	CC	406 7	C	74	110			.
	2	1	LND	403 11	C	56	100			.
	2	1	BND	402 67	C	58	79			.
	2	1	CSN	335 3	C	78	95			.
062001	3	1	LND	403 21	C	68	96			.
062101	4	1	WS	419 10	C	99	160			.
	4	1	BND	402 13	C	47	70			.
	5	1	WS	419 8	C	87	210			.
	5	1	BT	328 11	C	47	60			.
	5	1	BND	402 12	C	57	80			.
	5	1	LND	405 6	C	78	82			.
	6	1	BND	402 41	C	46	81			.
	6	1	LND	405 13	C	70	83			.
	6	1	BT	328 20	C	37	64			.
	6	1	CC	406 3	C	74	118			.
	6	1	WS	419 6	C	98	291			.
	7	1	CC	406 3	C	71	137			.
	7	1	BND	402 25	C	38	70			.
062101	7	1	WS	419 12	C	177	344			.
062201	8	1	CC	406 25	C	51	144			.
	8	1	WS	419 11	C	64	147			.
	8	1	CSH	335 32	C	62	77			.
062201	8	1	BND	402 83	C	38	74			.

BF

BULK FISH

NYSDEC Bureau of Fisheries Biological Survey Unit
Revised 23-Mar-01

ALIAS 1 CAYADUTTA CREEK

SURVEY NUMBER 2
501029

DATE (mm/dd/yy) 3	SITE 4	REP # 5	SPECIES CODE 6	# OF FISH 7	C/O	LENGTH MIN(mm) 9	LENGTH MAX(mm) 10	WEIGHT (g) 11	STAGE 12	MESH 13
062201	9	1	BT	328 13	C	40	55			
062201	9	1	BND	402 22	C	63	77			

ATTACMENT B

CORRESPONDENCE

New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources
Hale Creek Field Station
182 Steele Avenue Extension
Gloversville, New York 12078
518-773-7318 FAX 518-773-7319

Mark Kiburz
c/o C.T. Male
50 Centry Hill Drive
Latham, NY 12110

4/24/02

Dear Mr. Kiburz,

Enclosed are copies of fish kill and environmental spill reports associated with Independent Leather, Inc., Gloversville, NY, that are on file here at the Hale Creek Field Station. Initially when we talked this morning I confused Independent Leather with another large tannery in Gloversville. The information I relayed by telephone regarding an oil film traced to a possible storage tank under a tannery building was at the former Pan American Tannery.

Please call if I can be of further assistance.

Sincerely,

Timothy L. Preddice

Timothy L. Preddice
Biologist I (Aquatic)

C.T. MALE ASSOCIATES, P.C.

50 Century Hill Drive, P. O. Box 727, Latham, New York 12110-0727
518.786.7400 FAX 518.786.7299 www.ctmale.com

April 25, 2002

VIA U.S. MAIL

Mr. Mark Clough
United States Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

Re: Threatened and Endangered Species File Review Request
Independent Leather
Fulton County, NY
C.T. Male Project No. 01.7293

Dear Mr. Clough:

C.T. Male Associates, P.C. (C.T. Male) is working with the City of Gloversville to assist in the Independent Leather Site Environmental Restoration Project. The Independent Leather Site is located in the City of Gloversville, Fulton County, New York (refer to attached Site Location Map and Quadrangle Detail Sheet). All work will be conducted within the existing property boundaries.

The approximate coordinates at the midpoint of the project are: N 43°02'30" and W 74°21'15".

Please provide us with information on known occurrences of threatened or endangered organisms or habitats within the project area. Thank you very much for your time and if you have any further questions please do not hesitate to contact me or Karen Gaidasz at (518) 786-7400.

Sincerely,

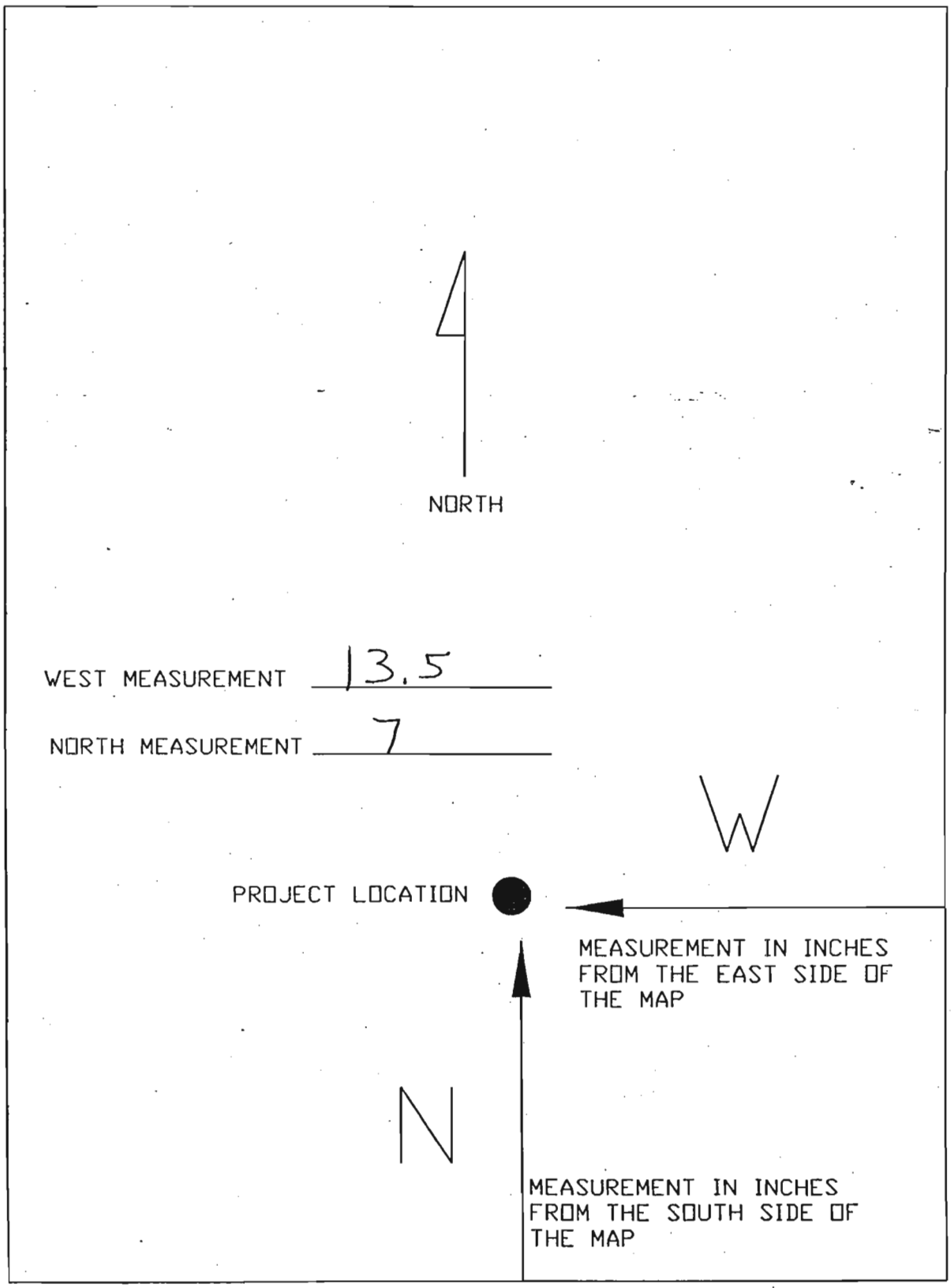
C.T. MALE ASSOCIATES, P.C.

Mark Kiburz
Environmental Scientist

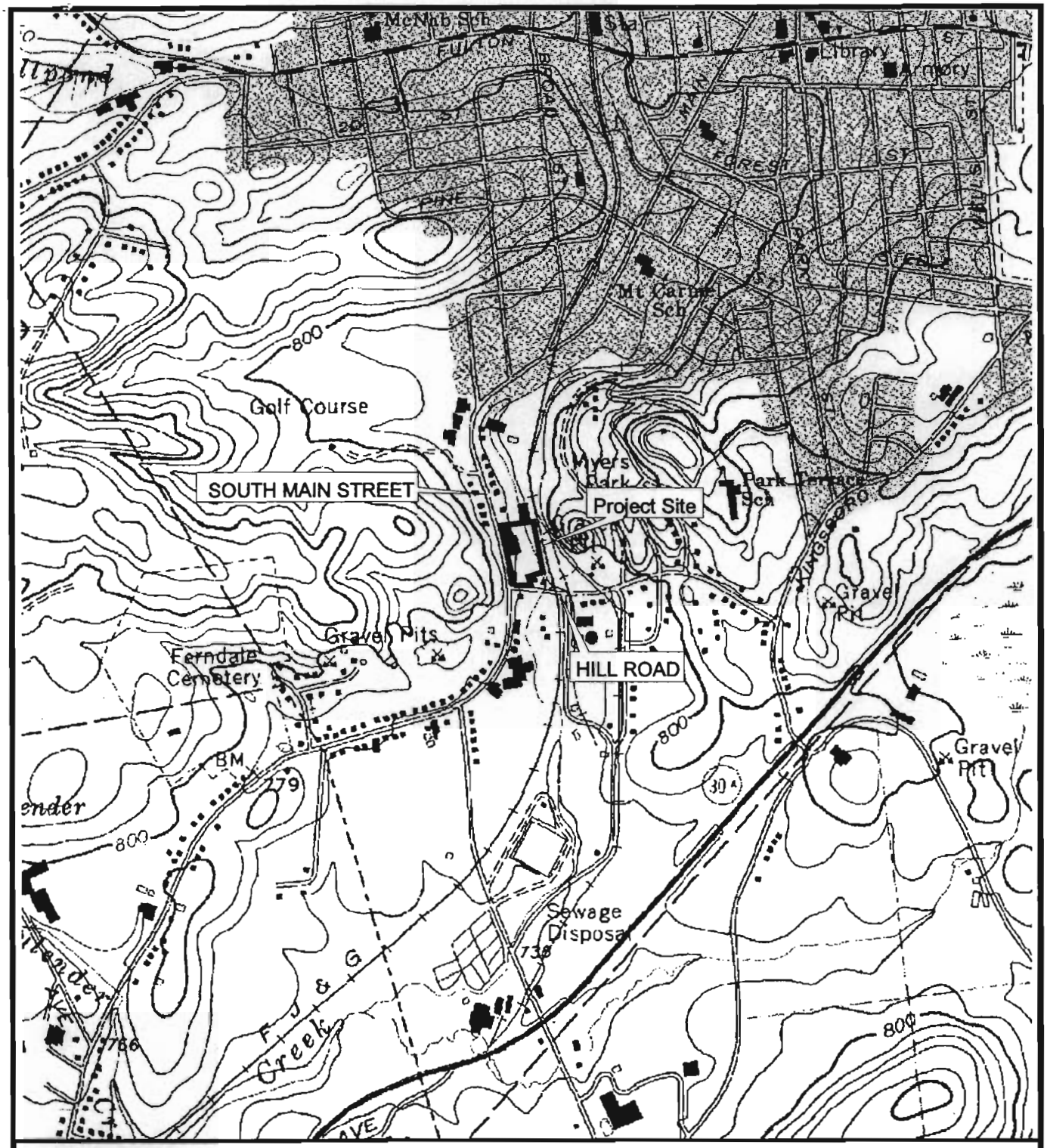
c: Ronald Ellis (City of Gloversville)
Kirk Moline and Karen Gaidasz (C.T. Male)

K:\Projects\017293\Admin\Fish and Wildlife Impact Analysis\L FWS T&E 04 26 02.doc

U.S.G.S. QUADRANGLE NAME Gloversville



CT MALE PROJECT NAME # Independent Leather Site



MAP REFERENCE
USGS TOPOGRAPHIC DATA
GLOVERSVILLE QUADRANGLE
DOWNLOADED FROM
THE GIS DATA DEPOT 7/18/01.

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ARCHITECTURE &
BUILDING SYSTEMS ENGINEERING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
SURVEY & LAND INFORMATION
SERVICES

C.T.MALE ASSOCIATES, P.C.

50 CENTURY HILL DRIVE, PO BOX 727, LATHAM, NY 12110
PHONE (518) 786-7400 FAX (518) 786-7299

FIGURE 1 SITE LOCATION MAP

INDEPENDENT LEATHER

CITY OF GLOVERSVILLE	FULTON COUNTY, NY
SCALE: 1"=1000'	
DRAFTER: MAK	
PROJECT NO: 01.7293	

C.T. MALE ASSOCIATES, P.C.

50 Century Hill Drive, P. O. Box 727, Latham, New York 12110-0727
518.786.7400 FAX 518.786.7299 www.ctmale.com

April 25, 2002

VIA U.S. MAIL

Ms. Jean Pietrusiak
New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
NY Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

Re: Threatened and Endangered Species File Review Request
Independent Leather
Fulton County, NY
C.T. Male Project No. 01.7293

Dear Ms. Pietrusiak:

C.T. Male Associates, P.C. (C.T. Male) is working with the City of Gloversville to assist in the Independent Leather Site Environmental Restoration Project. The Independent Leather Site is located in the City of Gloversville, Fulton County, New York (refer to attached Site Location Map). All work will be conducted within the existing property boundaries.

Please provide us with information on known occurrences of threatened or endangered organisms or habitats within the project area. Thank you very much for your time and if you have any further questions please do not hesitate to contact me or Karen Gaidasz at (518) 786-7400.

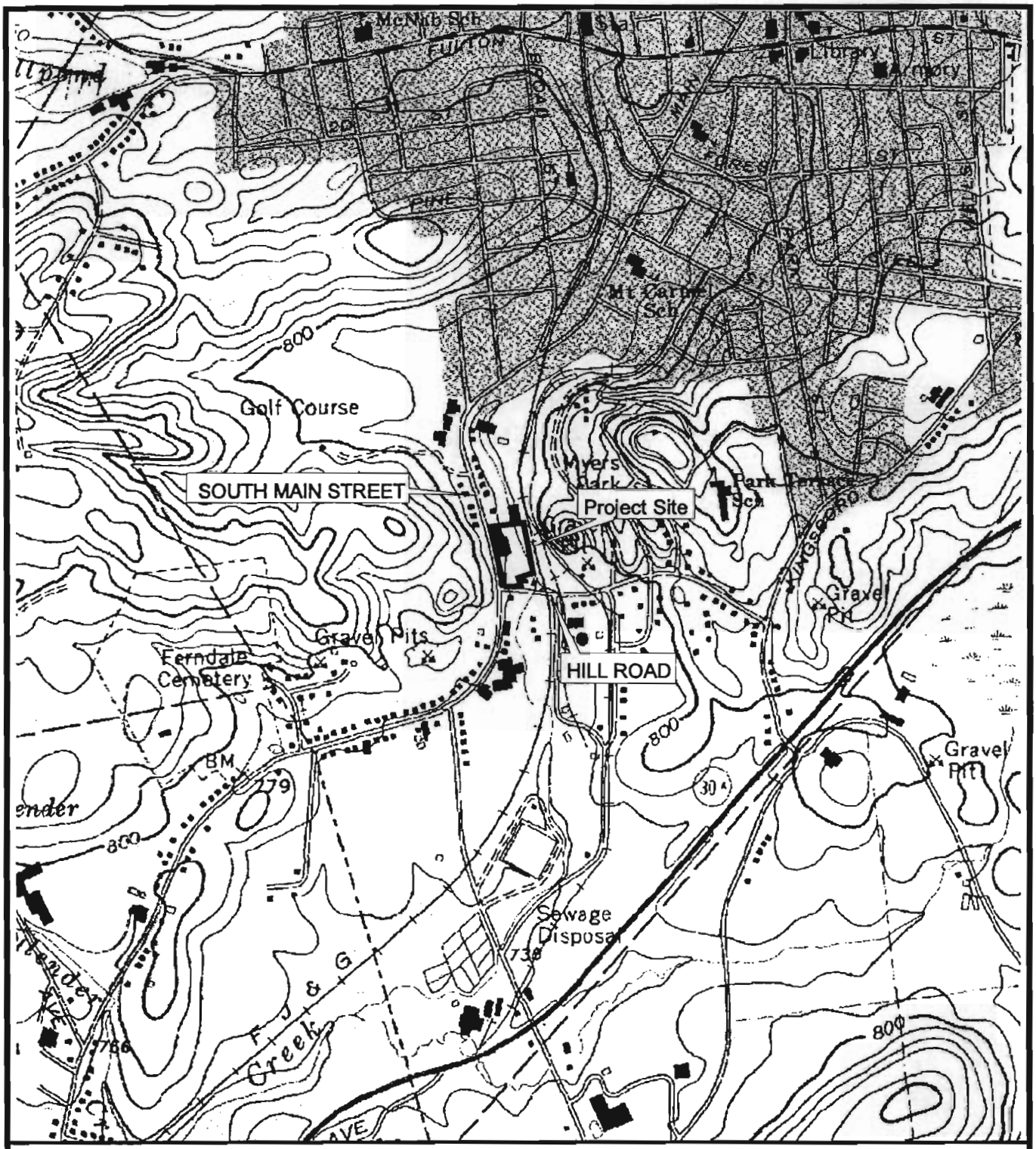
Sincerely,

C.T. MALE ASSOCIATES, P.C.

Mark Kiburz
Environmental Scientist

c: Ronald Ellis (City of Gloversville)
Kirk Moline and Karen Gaidasz (C.T. Male)

\\LathamFP\data\Projects\017293\Admin\Fish and Wildlife Impact Analysis\L DEC T&E 04 26 02.doc



MAP REFERENCE
USGS TOPOGRAPHIC DATA
GLOVERSVILLE QUADRANGLE
DOWNLOADED FROM
THE GIS DATA DEPOT 7/18/01.

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ARCHITECTURE &
BUILDING SYSTEMS ENGINEERING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
SURVEY & LAND INFORMATION
SERVICES

C.T.MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE, PO BOX 727, LATHAM, NY 12110
PHONE (518) 786-7400 FAX (518) 786-7299

FIGURE 1 SITE LOCATION MAP

INDEPENDENT LEATHER

CITY OF GLOVERSVILLE	FULTON COUNTY, NY
SCALE: 1"=1000'	
DRAFTER: MAK	
PROJECT NO: 01.7293	

C: Jeff Mark
Kirk Moline

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

May 6, 2002

Mark Kiburz
C T Male Associates
50 Century Hill Drive
Latham, NY 12110-0727

Dear Mr. Kiburz:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to the proposed Independent Leather Site Environmental Restoration Project - #01.7293, site as indicated on the map you provided, located in the Town of Gloversville, Fulton County.

> We have no records of <u>known</u> occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your sites.

The absence of data does not necessarily mean that rare or endangered elements, natural communities or other significant habitats do not exist on or adjacent to the proposed site, but rather that our files currently do not contain any information which indicates the presence. For most sites, comprehensive field surveys have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of rare or state-listed species, or of significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, signicant natural communities and other significant habitats maintained in the Natural Heritage Databases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,

Teresa Mackey jp

Teresa Mackey, Information Services
NY Natural Heritage Program

Enc.
cc: Reg. 5, Wildlife Mgr.

C: Kirk M
Jeff M
John M

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

May 3, 2002

Mr. Mark Kiburz
Environmental Scientist
C.T. Male Associates, P.C.
P.O. Box 727
Latham, NY 12110-0727

Attention: Ms. Karen Gaidasz

Dear Mr. Kiburz:

This responds to your letter of April 25, 2002, requesting information on the presence of endangered or threatened species in the vicinity of the proposed Independent Leather Site Environmental Restoration Project in the City of Gloversville, Fulton County, New York.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. In addition, no habitat in the project impact area is currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact the appropriate New York State Department of Environmental Conservation regional office(s) as shown on the enclosed map, and:

New York State Department of Environmental Conservation
New York Natural Heritage Program Information Services
625 Broadway
Albany, NY 12233
(518) 402-8935

Since wetlands may be present, you are advised that National Wetlands Inventory (NWI) maps may or may not be available for the project area. However, while the NWI maps are reasonably

accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems
302 Rice Hall
Cornell University
Ithaca, NY 14853
(607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting the appropriate Corps office(s) as shown on the enclosed map.

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely,

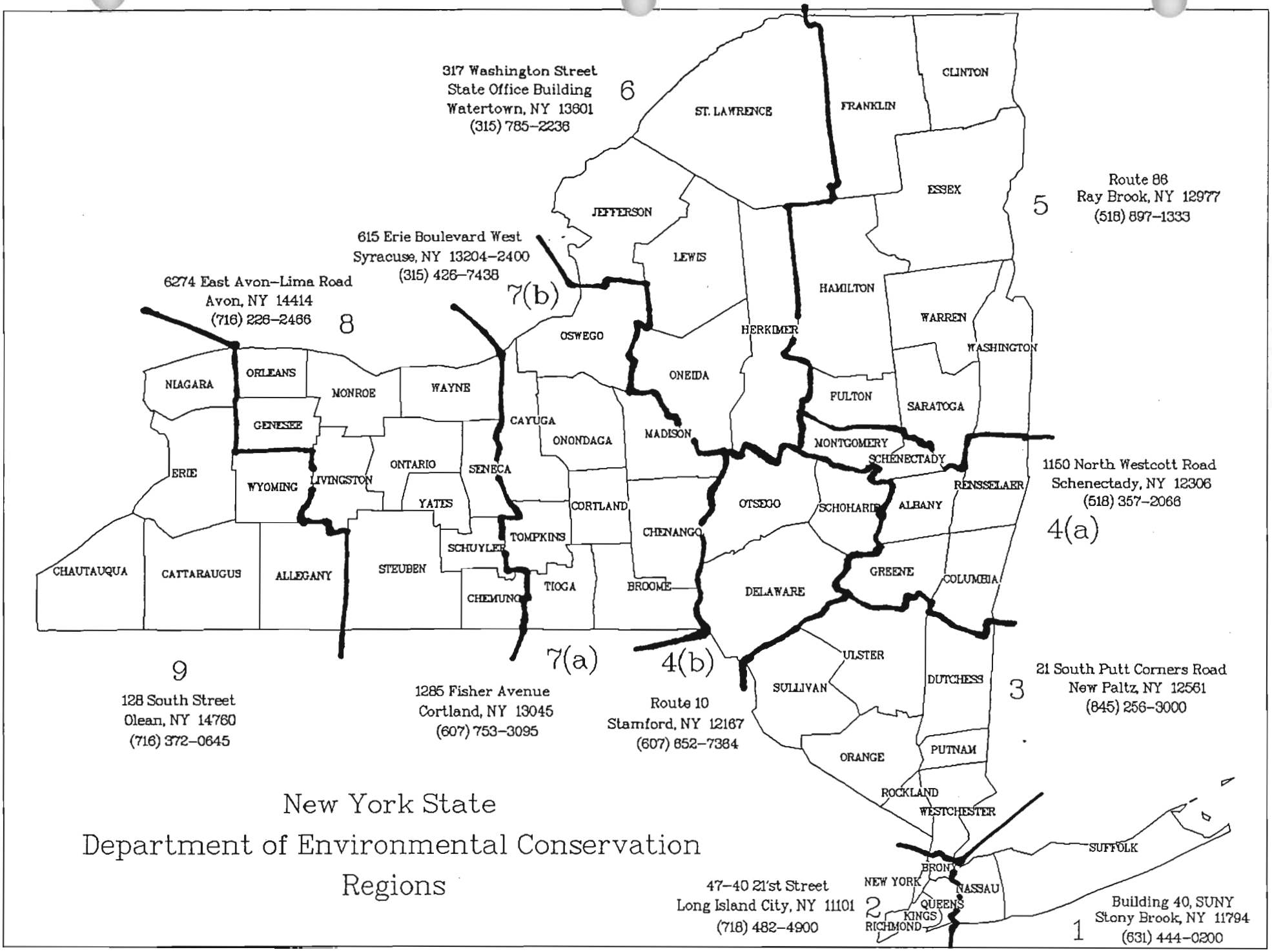
Mark W. Clough

Acting For

David A. Stilwell
Field Supervisor

Enclosure

cc: NYSDEC, Ray Brook, NY (Environmental Permits)
NYSDEC, Albany, NY (Natural Heritage Program)
COE, New York, NY



New York State
Department of Environmental Conservation
Regions

APPENDIX C

KNOWN WILDLIFE MORTALITY

New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources
Hale Creek Field Station
182 Steele Avenue Extension
Gloversville, New York 12078
518-773-7318 FAX 518-773-7319

Mark Kiburz
c/o C.T. Male
50 Centry Hill Drive
Latham, NY 12110

4/24/02

Dear Mr. Kiburz,

Enclosed are copies of fish kill and environmental spill reports associated with Independent Leather, Inc., Gloversville, NY, that are on file here at the Hale Creek Field Station. Initially when we talked this morning I confused Independent Leather with another large tannery in Gloversville. The information I relayed by telephone regarding an oil film traced to a possible storage tank under a tannery building was at the former Pan American Tannery.

Please call if I can be of further assistance.

Sincerely,

Timothy L. Preddice

Timothy L. Preddice
Biologist I (Aquatic)

Discovery Made after Apparent Toxic Chemical Spill

5,000 to 10,000 Fish in Cayadutta Said Killed

5,000 to 10,000 fish were kill-owing an apparent toxic al spill into the Cayadutta yesterday afternoon, ac- to State Environmental Con-on (EnCon) officials.

endent Leather Company, h Main Street, has been iden-s the likely source, according on. The kill is the second and f the year in this area.

ea resident notified the War-g EnCon office after he a suspicious substance in the creek late yesterday afternoon. Timothy Preddice, senior aquatic biologist, and Joseph Spoderyk, assistant analytical chemist, from the Hales Creek EnCon station were sent to investigate at 4:48.

The creek was cloudy from bank to bank at Harrison Street, according to Preddice. The grayish coloration was traced to Independent Leather. The water upstream from the leather company was reportedly clear.

Several thousand dead fish were found, mostly minnows and crayfish, Preddice stated. EnCon officials were unable to reach Independent Leather's management late yesterday afternoon and were reportedly attempting to confer with them this morning.

Preddice said skins are tumbled in wooden drums containg hot water and chemicals at Independent. The liquid is disposed of through a floor drain leading to the municipal sewer system.

An overflow area channels excess liquid to the creek. Preddice could not say how much of the toxic material wound up in the creek but estimated it was a "considerable amount."

The foreign substance had worked its way downstream to Townsend Avenue in Johnstown by 8 last night. Johnstown police notified EnCon Region 5 headquarters in Raybrook after learning of the condition.

Preddice credited the co-operation of the public and law enforcement officials with notifying EnCon of the spill so quickly.

The crayfish, Preddice noted, are a source of food for other fish. Dead creek chub and white suckers were also seen and many more fish appeared to be in distress.

The senior biologist said the incident is especially unfortunate because the creek had been bouncing back so well.

Only one other fishkill has occurred this year prior to yesterday's incident and Preddice said it was a minor one only involving a few hundred fish.

A fishkill is classified as "major" when 10,000 or more fish are involved.

EnCon officials hope to determine what toxic substance was spilled into the creek through talks with Independent Leather management and testing today.

Preddice said he expects to file an official report to Raybrook by Tuesday or Wednesday. He was unsure of the possible legal implications.

If conservation laws have been violated, circumstances such as: how co-operative the offender is, what plans to avoid futher problems are suggested and if the offender is a repeat violator will be weighed.

The most frequent penalty is a $250 civil penalty.

According to Preddice, Independent has not been involved in other fishkills, but the company has had other minor environmental problems.

Plank Blocking Drain Blamed For Creek Spill

A plank blocking a drain into the municipal sewer system at Independent Leather Company, 315 South Main Street, has been blamed in the toxic substance spill that killed from 5,000 to 10,000 fish in the Cayadutta Creek Thursday afternoon.

According to Timothy Preddice, senior biologist, State Department of Environmental Conservation (EnCon), the liquid that entered the creek was from a leather softening process and the source is "definitely" Independent Leather.

The biologist estimated it would take a year for the creek to bounce back to the point it had reached prior to the spill.

Discoloration was noted from Harrison Street in Gloversville downstream to Townsend Avenue in Johnstown.

00-00-103 (6/78)

COPY - Independent Leather

New York State Department of Environmental Conservation

MEMORANDUM

TO: DONALD CORLISS/WILEY LAVIGNE
FROM: TIMOTHY L. PREDDICE
SUBJECT: FISH KILL IN CAYADUTTA CREEK, GLOVERSVILLE (C), FULTON (CO.)
DATE: AUGUST 2, 1984

- INDEPENDENT LEATHER COMPANY -
315 SOUTH MAIN STREET
GLOVERSVILLE, NEW YORK 12078

During the afternoon (approximately 1430 hr) of 7/26/84, a resident (wishing to remain anonymous) of Fulton County, working in Gloversville, observed that Cayadutta Creek just downstream from Hill Street in Gloversville (see Figure 1) was a milky-white color. He looked closer at the stream and observed dead and distressed fish. Being very concerned about local pollution he notified the Region 5 South Encon office in Warrensburg of his observations. Shortly after, at 1448 hr., Environmental Conservation Officer (ECO) Thomas Callahan phoned the Hale Creek Field Station and reported the incident to Senior Aquatic Biologist, Timothy L. Preddice. ECO Callahan requested investigative assistance since no conservation officer or Fishery Unit personnel were available at that time.

Mr. Preddice, assisted by Associate Analytical Chemist Joseph G. Spodaryk, investigated the complaint shortly after receiving the notification. At 1520 hrs. Cayadutta Creek was very briefly inspected at the Hill Street bridge and the stream appeared clear. Assuming that the initial report was correct, the clear water indicated that the contaminant had flushed past this location. At 1530 hrs., the two scientists moved further downstream to Harrison Street to inspect the Creek. It was milky-white in color from bank to bank and several dead and distressed fish were observed; a situation identical to that described by the complainant. The water had an appearance and odor similar to that of leather wastes encountered on other investigations. Mr. Preddice collected a water sample at this location for

subsequent bioassay purposes. The pH of the stream at this location was 7.4, a level acceptable for fish life.

While at Harrison Street, Messrs. Preddice and Spodaryk inspected several nearby upstream pools and riffles looking for dead fish and invertebrates, and any other possible signs which might lead them to the source of the fish kill. Dead and distressed fish were most heavily concentrated in pool rather than riffle areas. Actual counts of dead fish varied from 60-70 to slightly over 100 per approximately 100 linear feet of habitat. A segment (paced off at 590 feet long) of stream with several pools and riffles contained about 500 dead or severely distressed fish. However, not all fish were seriously affected. The fishes affected were mostly minnows and, in order of abundance, included blacknose dace, creek chub, white sucker, common shiner, brown bullhead and pumpkinseed. A close inspection of the Creek's substrate also revealed several thousand dead and seriously distressed crayfish; the young were particularly sensitive. In several places 40-50 young crayfish were scattered about the bottom in areas no larger than a two-foot circle. The Harrison Street location is especially abundant with crayfish since their main predator, fish, were not as abundant as they should have been because of previous fish kills during the past few years. Cayadutta Creek was recuperating very nicely and it is very unfortunate that this incident occurred.

After leaving the Harrison Street location, Messrs. Preddice and Spodaryk inspected the Creek just downstream from the Niagara-Mohawk Corp. building on Hill Street. The water was slightly cloudy and about a dozen dead fish were observed, which indicated that the source of the fish kill was located upstream.

The Creek was next inspected upstream from Hill Street at the Merkt Oil Company crossing off South Main Street (upstream from Independent Leather). The aquatic communities, i.e., fish and invertebrates, in this area

At approximately 1110 hrs. on 7/27/84 Messrs. Preddice and Spodaryk met with Mr. George Valachovic, an Independent Leather Co. official. He verified reports that a waste line which drains to the municipal sewer system had become partially blocked by a board causing the overflow. The overflowed material was from large wooden drums where tanned leather is tumbled to condition and soften the leather using hot water and various chemicals. The prime chemical additive in the wooden drums, according to Mr. Valachovic, are known as fat liquors. These additives are used basically to soften and condition leather. Samples of two different fat liquors which were reportedly mixed and used on 7/26/84 were received from Mr. Valachovic. Mr. Valachovic reported that possibly 100 pounds of fat liquors are used with each batch of about 1,000 pounds of skins tumbled in a wooden drum. It was his opinion that nearly all of the fat liquor was absored by the skins. Various dilutions of these fat liquors were to be used for bioassay tests to determine the approximate acute toxicity of these materials to fish.

Mr. Preddice initiated bioassay tests at the Field Station on 7/27, 28 and 30 with the three stream samples and the two fat liquor samples (see results: Table 1). At this writing (1200 hrs. 8/2/84) most of the bioassays have been completed; the rest will be continued through a 96-hr. exposure period. The results of the continuing tests are not expected to change from those presented in Table 1.

A bioassay test basically involved exposing one young fathead minnow to one liter of test solution for at least a 96-hour period. The stream samples collected downstream from the Independent Leather Co. at Harrison Street, Gloversville and at Miller Street, Johnstown have proven to be lethal to fathead minnows. The Creek sample collected upstream from the Independent Leather Co. at the Merkt Oil Co. location has proven to be non-lethal and has caused no distress after 96 hours. These three bioassay tests have proven a violation of N.Y.S. Conservation Law 11-0503.

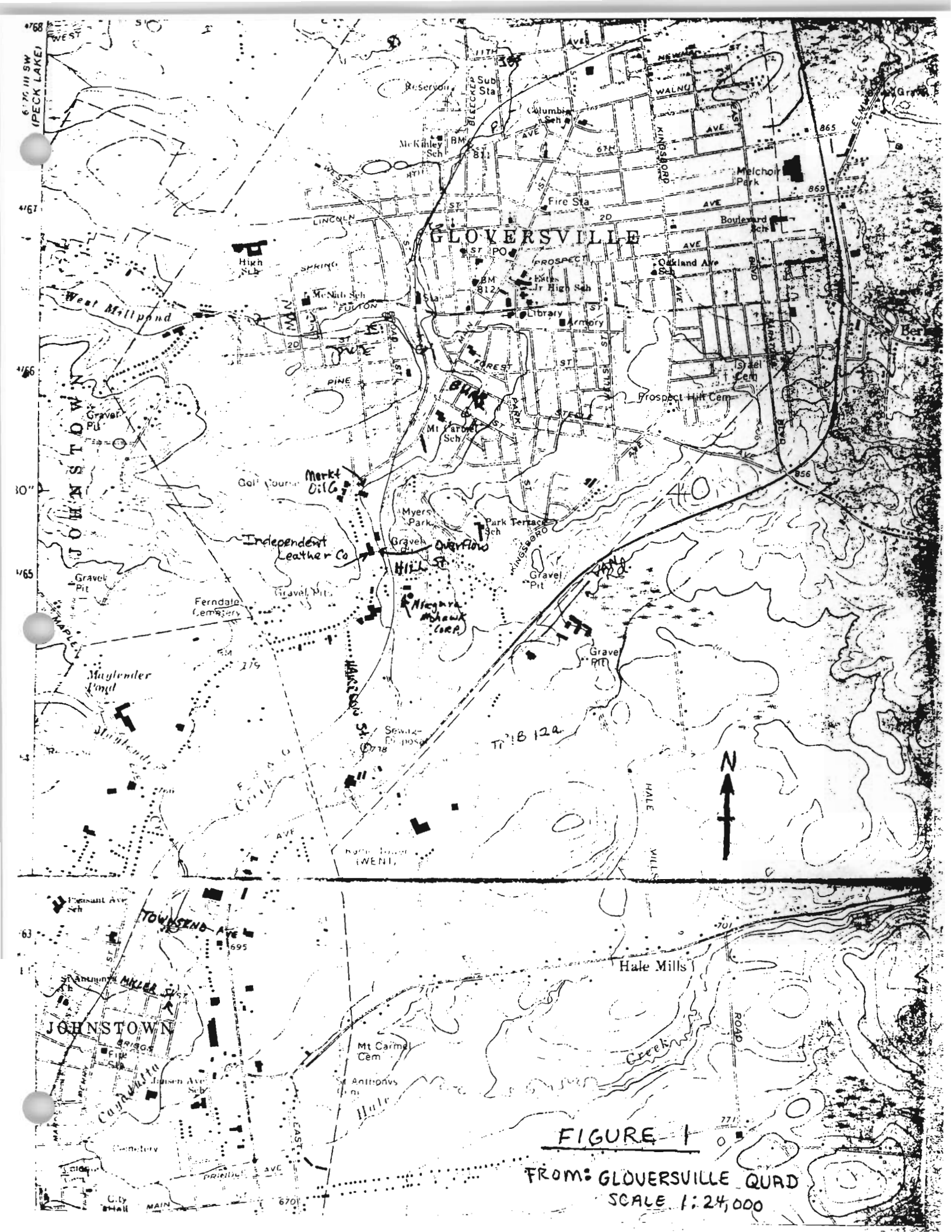


FIGURE 1

FROM: GLOVERSVILLE QUAD
SCALE 1:24,000

Table 1.- Results of static bioassay tests conducted for the 7/26/84 fish kill in Cayadutta Creek re Independent Leather Co., Gloversville, New York.

Sample No.	Location / Sample	Dilution	Start Date	Start Time	End Date	End Time	Duration Hours	Duration Min.	Temp.(F) Acclim.	Temp.(F) Test	TL(cm)	COMMENTS
0090	Upstream at Merkt Oil Co. G'ville.	none	07/27	1038	07/31	1349	99	11	65	68	4.0	Nonlethal-fish okay at termination no sign of distress during exposure
----	Independent Leather Co.	none	--	--	--	--	--	--	--	--	--	-----
0089	Downstream at Harrison St. G'ville.	none	07/27	1038	07/27	1617	5	39	65	67	3.7	Lethal-fish found dead, seriously distressed after 5hr24min. Death > 5hr24min < 5hr34min.
0091	Downstream at Miller St. Johnstown	none	07/27	1038	07/27	1422	3	44	65	67	3.2	Lethal-fish found dead, hardly breathing at 1405 (3hr27min). Death >3hr27min< 3hr44min.
0092	"NUTREEN" (fat liquor)	10,000x's	07/27	1617	07/30	0840	64	22	65	65	3.6	Lethal-fish found dead, distress evident after 19hr18min.
		20,000x's	07/27	1617	08/01	1610	119	53	65	65	3.8	Nonlethal-fish alive at termination distress evident after 19hr18min, 07/30-DO 6.5 ppm
		33,300x's	07/27	1617	08/01	1617	120	--	65	65	3.8	Nonlethal-fish alive at termination slight distress at most evident, fi seems okay at termination
0093	"EDB"	10,000x's	07/27	1617	07/27	2305	6	48	65	65	3.9	Lethal-observed fish die after fina swimming burst
		20,000x's	07/27	1617	07/28	1136	19	18	65	65	4.0	Lethal-fish stressed after 6hr29min fish found dead in morning. Death >6hr29min <19hr18min
		33,300x's	07/27	1617	07/28	1136	19	18	65	65	4.1	Lethal-same as above
		40,000x's	07/28	1148	07/30	0840	44	52	65	65	4.4	Lethal-fish stressed after 29hr17mi found dead in morning, death > 29hr 17min < 44hr52min.
		40,000x's	07/30	1500	07/31	0820	17	20	65	65	3.6	Lethal-fish stressed after 2hr10min found dead in morning, DO at term. 7.0 ppm. pH at term. 6.7, Death > 2hr10min < 17hr20min
		50,000x's	07/30	0921	*				65	65	3.8	Nonlethal-fish stressed after 22hr-59min; fish still alive @ 1200hr 08/02 after 74hr39min.
		50,000x's	07/30	1500	07/31	0820	17	20	65	65	3.7	Lethal-fish stressed after 2hr10min found dead in morning,DO at term 7.! ppm, pH at term. 6.7. Death> 2hr10 min < 17hr20min.

Continued....

Table 1 ..... continued

Location mple No.	Sample	Dilution	Start Date	Start Time	End Date	End Time	Duration Hours	Duration Min.	Temp.(F) Acclim	Temp.(F) Test	TL(cm)	COMMENTS
93		100,000x's	07/30	0921	*				65	65	3.5	Nonlethal-no sign of serious distress at 1200hr 08/02 after 74 hr 39 min. fish still alive
		100,000x's	07/30	1500	*				65	65	4.0	Nonlethal-no sign of serious distress at 1200 hr 08/02 after 69hr fish still alive

NOTE: *Test still continuing to a 96-hr. exposure period, results reported as of 1200hr 08/02/84.

Region 5 - Environmental Quality
Hudson Street, Warrensburg, NY 12885
(518) 623-3671 or 668-5441

November 9, 1984

Independent Leather Company
310 South Main Street
Gloversville, NY 12078

Attn: Mr. George Valachovic

RE: Independent Leather Co.
Gloversville (C), Fulton (Co.)

Dear Mr. Valachovic:

On Friday, November 2, 1984, I met with you to examine several pipes extruding from the bank of the Cayadutta Creek behind your facility.

Apparently from our conversation one of the pipes serves as a floor drain which periodically discharges from your leather dyeing operation. On October 15, 1984 Mr. Tim Preddice investigated a complaint regarding a pinkish red discoloration of the Cayadutta. The source of the discoloration was traced back to this particular pipe.

Another pipe along the bank was discharging a clear liquid during my visit. You indicated that it was a discharge from your boiler blowdown.

The other pipes along the bank were not discharging and are apparently no longer in use.

Be aware that the boiler blowdown and floor drain discharges are considered industrial wastewaters and must be connected to the municipal sewer system. All other pipes along the creek bank should either be removed or plugged with concrete to avoid any future questioning of their useage. Within forty-five days of receiving this letter, the above mentioned work should be completed.

On another matter, during my visit I also confirmed that you have satisfactorily complied with Sections III and IV of the September 14, 1984 Consent Order between this Department and Independent Leather Company. Your resolution of item III was not in accordance with the recommended procedure, however, your installation of a concrete storage pad to direct all leachate from the waste container to the

pretreatment settling tank appears to be acceptable.

Should you have any questions, please feel free to contact me.

Sincerely yours,

Wiley W. Lavigne, P.E.
Regional Water Engineer

by: Alfred P. Matrose, P.E.
Senior Sanitary Engineer

APM:lc

cc: M. Coutant
W. Lavigne
B. Rowback

EXHIBIT 4

DATA USABILITY SUMMARY REPORT

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429
Facsimile 518-251-4428

September 23, 2002

Jeffrey Marx
C. T. Male Associates
50 Century Hill Dr.
Latham, NY 12110

RE: **D**ata **U**sability **S**ummary **R**eport for Independent Leather Site Data Packages
STL Connecticut SDG Nos. 200963, 200990, 201033, 201049, and 201056

Dear Mr. Marx:

Review has been completed for the data packages generated by Severn Trent Laboratories that pertain to samples collected 4/22/02 through 5/10/02 at the Independent Leather site. Seventeen soil and seventeen aqueous samples were analyzed for TCL volatiles, TCL semivolatiles, TCL pesticides/PCBs, and TAL Metals/CN. Five additional samples were processed for TCL pesticides/PCBs and cyanide. Two equipment blanks and five trip blanks, and sample matrix spikes/duplicates were also processed. Methodologies utilized are those of the USEPA SW846.

The data packages submitted contained full deliverables for validation, but this usability report is generated primarily from review of the QC summary form information, review of the sample raw data, and limited review of associated QC raw data. Full validation has not been performed, but review was conducted in accordance with the NYSDEC 1997 DUSR description. The laboratory QC summary forms have been reviewed for implied application of validation qualifiers, per the USEPA Region 2 validation SOPs and the USEPA National Functional Guidelines for Data Review, and as affects the usability of the sample data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Field Duplicate Correlation
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Instrumental Tunes
* Calibration Standards
* CRA/CRI and ICP Serial Dilution Results
* Instrument IDLs

Those items listed above which show deficiency are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR level review.

In summary, sample processing was primarily conducted with compliance with protocol requirements. Most sample analyte data are usable as reported, or with qualification as estimated due to minor matrix or processing issues. The exceptions include the following:

1. Many of the pesticide reported detections are likely matrix interference and are edited to nondetection, sometimes at elevated reporting limits.
2. Cyanide results for the samples of the "SS" matrix are not usable due to matrix spike failure.
3. One bromomethane detection was an evident transcription error, and is edited to nondetection.
4. Mercury reporting limits (RLs) for soils have been lowered from those submitted by the laboratory.

Attached to this narrative are copies of the laboratory case narratives. Also enclosed are sample result forms with recommended validation edits/qualifiers indicated in red-ink. They should be reviewed in conjunction with this report.

The following text discusses quality issues of concern.

General

Sample result forms include "MDL" and "RL" values. The RL values should be used as project reporting limits.

Blind field duplicate correlations for soil sample MW-11(2-4) and aqueous sample B-3 were all within validation limits, with the exception of variances for antimony (107%RPD) and copper (128%RPD) in the soil sample. Results for those two elements in MW-11(2-4) and its duplicate are therefore qualified estimated. It is also noted that there is a significant variance in the solids content of the soil field duplicates (68% and 78%). Dry weight values correlate well.

Matrix spike/duplicate evaluations were performed for all fractions on MW-6(2-4), MW-12, volatiles on B-2, semivolatiles on MW-8, and metals/CN on MW-11(2-4), metals on MW-10 and SS-8(1-1.5), mercury and cyanide on MW-6, mercury on SW-3, and cyanide on SS-1. The entire target analyte list was evaluated in all of the laboratory control spikes (LCSs), and in most of the sample matrix spikes. Accuracy and precision were generally very good, with most outliers not adversely affecting sample reported results (i.e. slightly low or elevated matrix spike recoveries or duplicate correlations for analytes not detected above CRDL). Exceptions, which are primarily metals, are noted in the sections below.

Sample MW-9(2-4) was held two days prior to shipment, and was received by the laboratory four days after collection. Laboratory processing was timely, and SW846 holding times were met.

Although the samples were processed with SW846 holding time requirements, it is noted that all but a few of the analyses also meet the more strict NYSDEC ASP requirements.

Volatile Analyses by EPA 8260

The detection of bromomethane in SS-7(0.25-0.75) is edited to nondetection at the CRDL. The original reporting did not reflect the final analyst review.

Several samples exhibited a matrix effect on the recovery of the internal standards, and potentially target analytes. Some of those samples also showed outlying surrogate standard recoveries. Therefore, results for associated analytes in those samples are qualified as estimated ("J" and "UJ"). They are the following:
MW-8(2-4), MW-10(4-6), MW-11(2-4), Field Duplicate (soil)-nine analytes associated with ISs#2 and 3
MW-12(2-4) and CS-1 --all analytes
SS-8(1-1.5) --1,1,2,2-tetrachloroethane

All samples reported in SDG 200990 (collected 4/25/02) showed elevated recoveries for surrogate standard BFB on repeated analysis. Results for detected analytes in those four soils have been qualified estimated.

The acetone result for MW-10(4-6) should be that derived from the dilution analysis (750 ppb). The acetone result for MW-11(2-4) should also be that derived from the dilution analysis (370 ppb).

Due to presence in the associated equipment, rinse, trip, and/or method blanks, the following sample detections are considered contamination and edited to nondetection ("U"):
All methylene chloride detections
All acetone detections **except** MW-7,MW-13, and those samples collected 4/25/02 (SDG 200990)
Chloroform in MW-8(2-4)

Calibration standard responses were within action guidelines, with the exception of the following. Results for the designated samples are qualified as estimated in value:
acetone (34%D) in MW-6(2-4)
2-butanone (50%D) in MW-7, MW-13, Field Duplicate
cis-1,3 Dichloropropene (46%D) in SS-6
acetone detections in soil samples reported in SDG 200990 (53%RSD)
2-butanone (42%D) and vinyl acetate (39%D) results in the equipment and trip blank collected 4/25/02
Reported nondetection results for analytes showing elevated standard responses are not affected.

Matrix spikes of MW-6(2-4) showed slightly low recoveries for 2-chlorophenol and 4-chloro-3-methylphenol, and significantly low recoveries (21% and 12%) for pentachlorophenol. The results for the latter should be used with the consideration of a low bias in samples of similar matrix.

Semivolatile Analyses by EPA 8270C

Due to poor spectral quality, the detections of fluorene and 2,4,6-trichlorophenol in MW-7, and 2,4-dimethylphenol in SS-6, are edited to nondetection at the CRDL.

Due to presence in the associated equipment and/or method blanks, the following sample detections are considered contamination and edited to nondetection ("U"):
di-n-butylphthalate in MW-8(2-4)
bis(2-ethylhexyl)phthalate in all samples except CS-1
naphthalene in MW-11 Some of these detections were not properly flagged as "B" by the laboratory.

SS-6 exhibited a matrix effect on the recovery of the internal standard d12-perylene, and results for the seven associated analytes in that sample are qualified as estimated ("J" and "UJ").

Results for 3,3-dichlorobenzidine in the soil samples reported in SDG 200990 are qualified estimated, with a low bias, due to recovery in the LCS of 35%.

The results for 2,4-dinitrophenol in the samples collected 5/6/02 and 5/7/02 (SDG 201033) are qualified estimated ("UJ"), with a potential low bias, due to outlying initial calibration linearity (32%RSD).

Holding times, surrogate standard recoveries, calibration standards, and instrumental tunes were within required limits. Reported nondetection results for analytes showing elevated standard responses are not affected.

Pesticide/PCB Analyses

Most of the reported sample detections showed very poor dual column quantitative correlation and significant chromatographic interferences. Results for those showing greater than 25%D are qualified estimated, those greater than 70% are also considered tentative in identification ("NJ"). Those greater than 100%D are not reliably considered detections. These results have been edited to nondetection, as they represent a concentration above which it can be said that the analyte is not present. This results in elevated reporting limits in some cases. The attached report forms reflect these edits, which involve a significant majority of those reported.

As discussed in the case narratives, some of the calibration standard responses or the pesticide breakdown exceed protocol requirements, possibly due to the sample matrices. In these cases, the affected samples have been specifically reviewed during validation and found to have been unaffected, with the following exceptions
MW-10(4-6) -- results for the pesticides that sample are all qualified estimated.
Soils collected 5/10/02 (SDG 201056) --4,4'-DDD and endrin aldehyde detections are estimated.

Holding times for the samples were acceptable, and blanks showed no contamination.

Observed elevated surrogate recoveries do not affect the reported sample results (nondetection or already qualified estimated).

Metals/CN Analyses by 6000/7000

Soil report forms show an excessively higher reporting limit than necessary (by more than 100 fold). The reported MDLs for mercury on the sample report forms can be used as RLs. Sample detected values exceeding that limit should not be flagged as "B".

The cyanide matrix spike of SS-1 shows no recovery. The post-digest spike of the sample was acceptable. Results for cyanide in the SS soils are therefore rejected ("R") an unusable, as cyanide may not have recovered from those samples if present.

Matrix spike recoveries were out of range for antimony (67%), lead (181%), and cyanide (71%) in MW-6(2-4). Results for these analytes in the soils collected 4/22/092 through 4/24/02 are qualified estimated. The recovery for mercury was also high, but sample results are nondetection, and are unaffected.

Matrix spike recoveries were out of range for antimony (32%), barium (74%), mercury (260%), selenium (131%), and thallium (29%) in MW-11(2-4). All antimony, barium, and thallium results, and detected selenium and mercury results in the soils collected 4/25/02 are qualified estimated.

Matrix spike recoveries were out of range for potassium (207%) and selenium (73%) in MW-12. Results for these analytes in the aqueous samples collected in 5/6/02 amd 5/07/02 (SDGs 201033) are qualified estimated. Selenium also showed low recoveries (71% and 73%) in the associated low level CRI standards. No corrective action was required of the laboratory.

Matrix spike recoveries were out of range for antimony (69%), cadmium (143%), and selenium (153%) in SS-8(1-1.5). All antimony results in the SS soils collected 5/10/02 are qualified estimated. Antimony and selenium results of nondetection are not affected.

Duplicate evaluations are within validation guidelines.

Due to presence in the associated equipment blank, the detections of chromium in MW-6(2-4), MW-7(2-4), MW-9(2-4), and MW-14(2-4) are considered contamination and edited to nondetection ("U"). This results in elevated reporting limits.

ICP serial dilution evaluations of MW-14(2-4) and SS-8(1-1.5) were acceptable. Those for MW-11 (2-4) and MW-14 showed elevated correlation for sodium (16%D or 14%D). Results for sodium in the soil samples collected 4/22/02 and 4/23/02 and aqueous samples collected 5/8/02 are qualified estimated.

Silver results for the equipment blanks and the aqueous samples collected 5/6/02, 5/7/02, and 5/10/02 (SDGs 201033 and 201056) are qualified estimated due to low associated LCS recoveries (24% to 46%). No corrective action was required of the laboratory.

It has been verified in previous laboratory resubmissions that calcium results flagged as "H" in the raw data are actually within the linear range.

Data Completeness

Although the project requires NYSDEC ASP Category B deliverables (as requested on custody), the data packages provided are not in compliance. Omissions include

No analytical sequences for ICP metals analyses.
Metals results are not flagged with the spike, duplicate, or serial dilution flags.
Sample organic result forms do not state weights, volumes, or extraction dates.
Pesticide report forms are not flagged with the "P" flags were applicable.
Client IDs are not present on some of the raw data
The pagination was consistently barely legible or illegible

In some packages only one of multiple analyses were documented (as stated in the laboratory narrative).

Some of the data packages lacked certain summary forms or form entries that were present in the packages submitted later in the project. These items were not requested for resubmission, as the information was available in the raw data.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

SAMPLE INFORMATION
Date: 05/10/2002

Job Number.: 200963
Customer...: C.T. MALE ASSOCIATES, P.C.
Attn.....: JEFF MARX

Project Number.....: 20000442
Customer Project ID....: INDEPENDENT LEATHER
Project Description....: INDEPENDENT LEATHER SITE

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
200963-1	MW-5 (2'-4')	Soil	04/23/2002	15:25	04/26/2002	09:10
200963-2	MW-6 (2'-4')	Soil	04/24/2002	09:55	04/26/2002	09:10
200963-5	MW-7 (2'-4')	Soil	04/23/2002	12:15	04/26/2002	09:10
200963-6	MW-8 (2'-4')	Soil	04/23/2002	10:10	04/26/2002	09:10
200963-7	MW-9 (2'-4')	Soil	04/22/2002	12:50	04/26/2002	09:10
200963-8	MW-12 (2'-4')	Soil	04/24/2002	13:10	04/26/2002	09:10
200963-9	MW-14 (2'-4')	Soil	04/24/2002	16:30	04/26/2002	09:10

SAMPLE INFORMATION
Date: 05/16/2002

Job Number.: 200990
Customer...: C.T. MALE ASSOCIATES, P.C.
Attn.....: KIRK MOLINE

Project Number.....: 20000442
Customer Project ID....: INDEPENDENT LEATHER
Project Description....: INDEPENDENT LEATHER SITE

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
200990-1	MW-10(4'-6')	Soil	04/25/2002	15:40	04/27/2002	10:35
200990-2	MW-11(2'-4')	Soil	04/25/2002	12:50	04/27/2002	10:35
200990-3	MW-13(0'-4')	Soil	04/25/2002	10:35	04/27/2002	10:35
200990-4	FIELD DUPLICATE	Soil	04/25/2002	00:00	04/27/2002	10:35
200990-5	TRIP BLANK	Water	04/25/2002	00:00	04/27/2002	10:35
200990-6	EQUIPMENT BLANK	Water	04/25/2002	14:30	04/27/2002	10:35

SAMPLE INFORMATION
Date: 05/24/2002

Job Number.: 201033
Customer...: C.T. MALE ASSOCIATES, P.C.
Attn.....: KIRK MOLINE

Project Number.....: 20000442
Customer Project ID....: INDEPENDENT LEATHER
Project Description....: INDEPENDENT LEATHER SITE

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
201033-1	MW-9	Water	05/06/2002	10:50	05/08/2002	09:40
201033-2	MW-8	Water	05/06/2002	13:45	05/08/2002	09:40
201033-3	MW-7	Water	05/06/2002	14:00	05/08/2002	09:40
201033-4	MW-5	Water	05/06/2002	15:05	05/08/2002	09:40
201033-5	TRIP BLANK	Water	05/06/2002	00:00	05/08/2002	09:40
201033-6	MW-12	Water	05/07/2002	09:45	05/09/2002	09:50
201033-7	B-3	Water	05/07/2002	11:15	05/09/2002	09:50
201033-8	MW-15	Water	05/07/2002	12:45	05/09/2002	09:50
201033-9	MW-13	Water	05/07/2002	14:40	05/09/2002	09:50
201033-10	FIELD DUPLICATE	Water	05/07/2002	00:00	05/09/2002	09:50
201033-11	TB 5/7/02	Water	05/07/2002	00:00	05/09/2002	09:50

SAMPLE INFORMATION

Date: 05/28/2002

Job Number.: 201049
Customer...: C.T. MALE ASSOCIATES, P.C.
Attn.....: KIRK MOLINE

Project Number.....: 20000442
Customer Project ID....: INDEPENDENT LEATHER
Project Description....: INDEPENDENT LEATHER SITE

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
201049-1	MW-6	Water	05/08/2002	15:20	05/10/2002	09:45
201049-2	MW-10	Water	05/08/2002	14:15	05/10/2002	09:45
201049-3	EQUIPMENT BLANK	Water	05/08/2002	12:40	05/10/2002	09:45
201049-4	MW-14	Water	05/08/2002	13:45	05/10/2002	09:45
201049-5	MW-11	Water	05/08/2002	11:00	05/10/2002	09:45
201049-6	B-2	Water	05/08/2002	09:38	05/10/2002	09:45
201049-7	TRIP BLANK	Water	05/08/2002	00:00	05/10/2002	09:45

S A M P L E I N F O R M A T I O N

Date: 05/29/2002

Job Number.: 201056
Customer...: C.T. MALE ASSOCIATES, P.C.
Attn.....: KIRK MOLINE

Project Number.....: 20000442
Customer Project ID....: INDEPENDENT LEATHER
Project Description....: INDEPENDENT LEATHER SITE

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
201056-1	SW-3	Water	05/10/2002	12:55	05/11/2002	09:40
201056-2	SW-2	Water	05/10/2002	13:15	05/11/2002	09:40
201056-3	SW-1	Water	05/10/2002	13:40	05/11/2002	09:40
201056-4	CS-3	Soil	05/10/2002	14:11	05/11/2002	09:40
201056-5	CS-2	Soil	05/10/2002	14:15	05/11/2002	09:40
201056-6	CS-1	Soil	05/10/2002	14:25	05/11/2002	09:40
201056-7	TRIP BLANK	Water	05/10/2002	00:00	05/11/2002	09:40
201056-8	SS-8 (1-1.5')	Soil	05/10/2002	08:45	05/11/2002	09:40
201056-9	SS-2 (0.75-1.25')	Soil	05/10/2002	09:15	05/11/2002	09:40
201056-10	SS-7 (0.25-0.75')	Soil	05/10/2002	09:55	05/11/2002	09:40
201056-11	SS-5 (0.5-1')	Soil	05/10/2002	10:30	05/11/2002	09:40
201056-12	SS-6	Soil	05/10/2002	11:00	05/11/2002	09:40
201056-13	SS-1	Soil	05/10/2002	14:40	05/11/2002	09:40
201056-14	SS-3	Soil	05/10/2002	14:45	05/11/2002	09:40
201056-15	SS-4	Soil	05/10/2002	14:55	05/11/2002	09:40

STL Report : 200963
CT MALE ASSOCIATES, P.C.

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Organic Extraction - Samples were extracted according to methods 3541/3550B. Samples for 8082 analysis were cleaned-up using procedures outlined in method 3665A (acid clean-up). No problems were encountered.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. The spike recovery for sample "MW-6 (2'-4') was under criteria limits; therefore, a post-digestion spike was analyzed. No other analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
Cyanide, Total	9012	1

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Semi-Volatile Organics - Semi-volatile organic samples were analyzed by capillary GC/MS according to NYSDEC '95 Protocols using guidance provided in Method 8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

A 2ul injection was used for all samples and standards. The instrument was calibrated at 10ng/ul (20 ng), 25 ng/ul(50 ng), 40ng/ul(80ng), 60ng/ul(120ng) and 80ng/ul(160ng). Internal standards were added to all samples and standards were at 20ng/ul(40ng).

The spike recovery for the compound, 4,6-dinitro-2-methylphenol, was below recovery limits for 5032-2LCS.

The spike recovery for the compounds, 2-chlorophenol, 4-chloro-3-methylphenol and pentachlorophenol, was below recovery limits for MW-6 (2'-4')MS/MSD.

The %RPD for the compound, pentachlorophenol, was above acceptance criteria for the MS/MSD.

The laboratory inadvertently did not extract an MSB with the MS/MSD, therefore the LCS extracted with the batch will take the place of the MSB.

Sample MW-12 (2'-4') was analyzed at a 1:2 dilution due to the presence of high levels of target compounds.

Sample Calculation:

Sample ID – MW-8 (2'-4')
Compound - naphthalene

$$\frac{(865943)(40)(500)(1.0)}{(1026328)(.961)(2.0)(15.0)(.851)} = 687 = 690 \text{ ug/kg}$$

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3050B/6010B; mercury-7471A.

Seven "*" flags resulted from duplicate analysis of soil QC sample 200963-2 for aluminum, chromium, cobalt, copper, nickel, potassium, and zinc.

Antimony and lead failed the controls for spike recovery analysis of soil QC sample 200963-2 resulting in two "N" flags.

No other problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Pesticides - Pesticide samples were analyzed by GC/ECD using guidance provided in Method 8081A. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Surrogate recovery for Decachlorobiphenyl was above QC limits in MW-6 (2'-4')MSD, MW-8 (2'-4'), and MW-12 (2'-4') probably due to sample matrix.

The spike percent recovery for Methoxychlor was below QC limits at 71% in 5087-2LCS. This compound was not present in any of the client's samples above the reporting limit.

Results for alpha-Chlordane and Endosulfan I were reported from the DB-1701 column in sample 5087-2LCS due to coelution on the RTX-35 column.

Results for Methoxychlor and Endosulfan Sulfate were reported from the RTX-35 column in sample 5087-2LCS due to coelution on the DB-1701 column.

Results for Methoxychlor were reported from the DB-1701 column in sample MW-12 (2'-4') due to sample matrix interference on the RTX-35 column.

The % difference for Endrin Aldehyde was below QC limits in the INDB3 standard analyzed at 5/2/02 at 23:27 on the RTX-35 column. This was the end standard for 5087-2LCS. This compound was reported from the DB-1701 column.

The % difference for 4,4'-DDT was below QC limits in the INDA3 standard analyzed at 5/9/02 at 03:26 on the RTX-35 column. This was the end standard for MW-6 (2'-4'), MW-8 (2'-4'), MW-9 (2'-4'), MW-12 (2'-4'), MW-14 (2'-4'), and MW-6 (2'-4')MS/MSD. Samples were run twice with similar results. Sample matrix was the suspected cause. This compound was not present in any of the client's samples.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID –MW-5 (2'-4')

Compound – alpha-BHC

$$\frac{(7330150\text{area})(10000\text{ul})}{(754360884\text{area/ng})(30.2\text{g})(0.855)(1\text{ul})} = 3.76$$

Polychlorinated Biphenyls (PCB's) - Pesticide/PCB samples were analyzed by GC/ECD using guidance provided in Method 8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

All samples were analyzed without any apparent problems.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID – 5087-3LCS
Compound – Aroclor-1242 peak 5.83, DB-1701

$$\frac{(11056252\text{area})(10000\text{ul})}{(23807410\text{area/ng})(30\text{g})(1\text{ul})} = 155\text{ug/Kg}$$

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator/Archon 51 autosampler interfaced with a Hewlett Packard Model 5971A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control sample (020PPB_QCS).

Sample Calculation:

Sample ID –MW-7 (2'-4')
Compound –Acetone

$$\frac{(26454)(125)}{(612022)(.128)(.904)(5)} = 9.3 = 9 \text{ UG/KG.}$$

Samples MW-8(2'-4') and MW-12(2'-4') were analyzed twice due to results exhibiting suppression of internal standard areas and surrogate recoveries out of criteria. One set of data was reported per sample.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.

STL Report : 200990
CT MALE ASSOCIATES, P.C.

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Organic Extraction - Samples were extracted according to methods 3550B/3510C. Solid samples for 8082 analysis were cleaned-up using procedures outlined in method 3665A (acid clean-up). No problems were encountered.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
Cyanide, Total	9012	1

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Semi-Volatile Organics - Semi-volatile organic samples were analyzed by capillary GC/MS according to NYSDEC '95 Protocols using guidance provided in Method 8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

A 2ul injection was used for all samples and standards. The instrument was calibrated at 10ng/ul (20 ng), 25 ng/ul(50 ng), 40ng/ul(80ng), 60ng/ul(120ng) and 80ng/ul(160ng). Internal standards were added to all samples and standards were at 20ng/ul(40ng).

The spike recovery for the compounds, pentachlorophenol and 3,3'-dichlorobenzidine, was below recovery limits for 5037-2LCS.

Sample MW-10 (4'-6') was analyzed at a 1:2 dilution due to the presence of high levels of target compounds.

Sample Calculation:

Sample ID – FIELD DUPLICATE
Compound - Naphthalene

$$\frac{(395067)(40)(1000)(1.0)}{(351906)(.902)(2.0)(30.6)(.676)} = 1203 = 1200 \text{ ug/kg}$$

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator/Archon 51 autosampler interfaced with a Hewlett Packard Model 5970A/5971A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control samples (020PPB_QCS) except for carbon disulfide.

Sample Calculation:

Sample ID –MW-10(4'-6')
Compound –Acetone

$$\frac{(1191888)(125)}{(649326)(.128)(5)(.549)} = 653 = 650 \text{ UG/KG.}$$

The following samples were analyzed at dilutions due to high target compound concentrations:

MW-10(4'-6')DL	1:5
MW-11(2'-4')DL	1:2
MW-13(0'-4') and RE	1:5

The following samples were analyzed twice due to results exhibiting suppression of internal standard areas and/or suppression of internal standard areas: MW-10(4'-6'), MW-11(2'-4') and MW013(0'-4'). The samples were also analyzed at dilutions and due to this both sets of data were reported to show that the samples proved matrix interference.

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3010A, 3050B/6010B; mercury-7470A, 7471A.

Seven "*" flags resulted from duplicate analysis of soil QC sample 200990-2 for aluminum, antimony, cadmium, copper, iron, magnesium, and vanadium.

Antimony, barium, selenium, and thallium failed the controls for spike recovery analysis of soil QC sample 200990-2 resulting in four "N" flags.

One "E" flag resulted from serial dilution of sample 200990-2 for sodium.

No other problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Pesticides - Pesticide samples were analyzed by GC/ECD using guidance provided in Method 8081A. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Surrogate recovery for Decachlorobiphenyl was above QC limits in MW-10 (4'-6') due to sample matrix.

Results for Endosulfan I and alpha-Chlordane were reported from the DB-1701 column in 5088-2LCS and 5308-2LCS due to coelution on the RTX-35 column.

Results for Endrin were reported from the DB-1701 column in 5088-2LCS and 5308-2LCS.

Results for Methoxychlor were reported from the RTX-35 column in 5088-2LCS and 5308-2LCS.

The % breakdown for 4,4'-DDT was outside of QC limits in the IBS standard analyzed at 06:00 on 5/14/02 on the RTX-35 column. The % differences for all of the compounds were below QC limits in the INDB3 standard analyzed at 06:35 on 5/14/02 on the RTX-35 column. These were the end standards for samples 5308-1MB, 5308-2LCS, and MW-10 (4'-6'). These samples were run twice with similar results. Sample matrix was the suspected cause. All results were reported from the DB-1701 column, except as noted.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID – MW-10 (4'-6')
Compound – 4,4'-DDE

$$\frac{(102328089\text{area})(10000\text{ul})}{(772730839\text{area/ng})(30.0\text{g})(0.549)(1\text{ul})} = 80.4\ \text{ug/Kg}$$

Polychlorinated Biphenyls (PCB's) - PCB samples were analyzed by GC/ECD using guidance provided in Method 8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Surrogate recovery for Decachlorobiphenyl was above QC limits in MW-10 (4'-6') due to sample matrix.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID – 5308-3LCS
Compound – Aroclor-1260 peak 15.39, RTX-35 column

(29816940area)(10000ul) = 156ug/Kg
(63740542area/ng)(30g)(1ul)

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.

STL Report : 201033
C.T.T MALE ASSOCIATES

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Organic Extraction - Samples were extracted according to method 3510C. No problems were encountered.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett Packard Model 5970A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control samples (020PPB_QCS) except for acetone.

Sample Calculation:

Sample ID – MW-7
Compound –Acetone

$$\frac{(216047)(125)(1)}{(1872993)(.073)(5)} = 39.5 = 40 \text{ UG/L.}$$

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
Cyanide, Total	9012	1

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Pesticides and Polychlorinated Biphenyls (PCB's) - Pesticide/PCB samples were analyzed by GC/ECD using guidance provided in Method 8081A/8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Samples 5428-18SBLK and MW-15 required sulfur cleanup prior to analysis.

The surrogate, Decachlorobiphenyl, was lost in sample matrix in MW-13 on the RTX-35 column.

Results for alpha-Chlordane and Endosulfan I were reported from the DB-1701 column in 5373-2LCS and 5428-2LCS due to coelution on the RTX-35 column.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID - MW-7
Compound – 4,4'-DDE

$$\frac{(5336546\text{area})(10000\text{ul})}{(748472573\text{area/ng})(1000\text{ml})(1\text{ul})} = 0.0713 \text{ ug/L}$$

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3010A/6010B; mercury-7470A.

Potassium and selenium failed the controls for spike recovery analysis of sample 201033-6 resulting in two "N" flags.

Two "E" flags resulted from serial dilution of sample 201033-6 for potassium and sodium.

Silver recovery was below the lab criteria for the LCSW analysis. Antimony and silver are an exception to the criteria so no corrective action was taken.

No other problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Semi-Volatile Organics - Semi-volatile organic samples were analyzed by capillary GC/MS according to NYSDEC Protocols using guidance provided in Method 8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

A 2ul injection was used for all samples and standards. The instrument was calibrated at 10ng/ul (20 ng), 25 ng/ul(50 ng), 40ng/ul(80ng), 60ng/ul(120ng) and 80ng/ul(160ng). Internal standards were added to all samples and standards were at 20ng/ul(40ng).

Sample MW-3 was analyzed at a 1:2 dilution due to the presence of high levels of target compounds.

Sample Calculation:

Sample ID – MW-15
Compound - naphthalene

$$\frac{(392618)(40)(1000)(1.0)}{(718134)(.908.)(2.0)(1000)} = 12 \text{ ug/l}$$

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.

STL Report : 201049
C.T. MALE

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Organic Extraction - Samples were extracted according to method 3510C. No problems were encountered.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett Packard Model 5970A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control samples (020PPB_QCS) except for acetone and 1,1-dichloroethene.

Sample Calculation:

Sample ID –MW-11
Compound –Acetone

$$\frac{(56155)(125)(1)}{(1682761)(.073)(5)} = 11.4 = 11 \text{ UG/L.}$$

Batch QC has been submitted for this job.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
Cyanide, Total	9012	1

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3010A/6010B; mercury-7470A.

One "E" flag resulted from serial dilution of sample 201049-4 for sodium.

Silver recovery was below the lab criteria for the LCSW analysis. Antimony and silver are an exception to the criteria so no corrective action was taken.

Lead recovered above the laboratory controls limits for ICSAB analysis. No corrective action was taken.

No other problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Polychlorinated Biphenyls (PCB's) - PCB samples were analyzed by GC/ECD using guidance provided in Method 8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

All samples were analyzed without any apparent problems.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID –5536-3LCS
Compound – Aroclor 1260 peak at retention time 16.13.
(25472158area)(10000ul) = 4.376ug/L
(58198053.3area/ng)(1000ml)(1ul)

Pesticides - Pesticide samples were analyzed by GC/ECD using guidance provided in Method 8081A. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

The recovery of the surrogate, Tetrachlorometaxylene was above QC limits in MW-10 on the RTX-35 column.

The recovery of the surrogate, Decachlorobiphenyl, was below QC limits in MW-11 on the RTX-35 column due to sample matrix interference.

The spike compounds Endosulfan I and alpha Chlordane were reported from the DB-1701 column for sample 5536-2LCS. These compounds coelute on the RTX-35 column.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID –MW-10
Compound – Endrin Aldehyde
(2694321area)(10000ul) = .0691ug/L
(389382314area/ng)(1000ml)(1ul)

Semi-Volatile Organics - Semi-volatile organic samples were analyzed by capillary GC/MS according to NYSDEC Protocols using guidance provided in Method 8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

A 2ul injection was used for all samples and standards. The instrument was calibrated at 10ng/ul (20 ng), 25 ng/ul(50 ng), 40ng/ul(80ng), 60ng/ul(120ng) and 80ng/ul(160ng). Internal standards were added to all samples and standards were at 20ng/ul(40ng).

Sample MW-10 was analyzed at a 1:20 dilution due to the presence of high levels of target compounds.

Sample Calculation:

Sample ID – MW-10
Compound - naphthalene

$$\frac{(4221736)(40)(1000)(20)}{(1789137)(.899)(2.0)(1000)} = 1049 = 1000 \text{ ug/l}$$

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.

STL Report : 201056
C.T. MALE ASSOCIATES

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Organic Extraction - Samples were extracted according to methods 3550B/3510C. Solid samples for 8082 analysis were cleaned-up using procedures outlined in methods 3665A (acid ur clean-up). No problems were encountered.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator/Archon 51 autosampler interfaced with a Hewlett Packard Model 5970A/ 5971A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control samples (020PPB_QCS) except for chloromethane, vinyl chloride, acetone and 1,2-dichloroethane.

Sample Calculation:

Sample ID – SS-8 (1-1.5')RE
Compound –Acetone

$$\frac{(45718)(125)}{(729600)(.110)(5)(.83)} = 17.15 = 17 \text{ UG/KG.}$$

Sample SS-6 was analyzed at a 1:10 dilution as a medium level soil due to high target compound concentrations.

Samples CS-1 and SS-8 (1-1.5') were analyzed twice due to results exhibiting suppression of internal standard areas and/or surrogate recoveries out of criteria. Both samples were reported since matrix interference was proven.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. The matrix spike recovery for cyanide analysis did not meet criteria limits; therefore, a post-digestion spike was analyzed. No other analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
Cyanide, Total	9012	1

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3010A, 3050B/6010B; mercury-7470A, 7471A.

Silver recovery was below the lab criteria for the LCSW analysis. Antimony and silver are an exception to the criteria so no corrective action was taken.

Three "*" flags resulted from duplicate analysis of QC soil sample 201056-8 for barium, cobalt, and lead.

Antimony, cadmium, and selenium failed the controls for spike recovery analysis of QC soil sample 201056-8 resulting in three "N" flags.

No other problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Semi-Volatile Organics - Semi-volatile organic samples were analyzed by capillary GC/MS according to NYSDEC Protocols using guidance provided in Method 8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

A 2ul injection was used for all samples and standards. The instrument was calibrated at 10ng/ul (20 ng), 25 ng/ul(50 ng), 40ng/ul(80ng), 60ng/ul(120ng) and 80ng/ul(160ng). Internal standards were added to all samples and standards were at 20ng/ul(40ng).

Sample CS-1 was analyzed at a 1:2 dilution and sample SS-6 at a 1:25 due to the presence of high levels of target compounds.

Sample SS-6 was originally straight and exhibited internal standard area suppression. The sample was reanalyzed at a dilution also exhibiting suppression confirming matrix interference. The diluted run has been reported.

Sample Calculation:

Sample ID – SS-8 (1-1.5')
Compound - phenanthrene

$$\frac{(600793)(40)(1000)(1.0)}{(1762919)(.896)(2.0)(30.1)(.83)} = 204 = 300 \text{ ug/kg}$$

Pesticides - Pesticide samples were analyzed by GC/ECD using guidance provided in Method 8081A. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Samples 5610-16SBLK, CS-1, SS-5 (0.5-1'), and SS-6 required sulfur cleanup prior to analysis.

Surrogate recovery for Decachlorobiphenyl was above QC limits in SS-4 on the DB-1701 column due to sample matrix interference.

Surrogate recovery for Decachlorobiphenyl was above QC limits in CS-3, CS-2, CS-1, SS-8 (1-1.5), SS-2 (0.75-1.25'), SS-1, SS-3, and SS-4 on the RTX-35 column due to sample matrix interference.

The % breakdown for 4,4'-DDT was above QC limits in the IBS standard run at 22:08 on 5/21/02 on the DB-1701 column. The % difference for Endrin Aldehyde was above QC limits in the INDB3 standard analyzed at 23:09 on 5/21/02 on the DB-1701 column. These were the end bracketing standards for all of the soil samples. Sample matrix was the suspected cause.

The % breakdown for 4,4'-DDT was above QC limits in the IBS standard run at 10:18 on 5/23/02 on the RTX-35 column. The % difference for 4,4'-DDD, 4,4'-DDT, and Methoxychlor were outside of QC limits in the INDA3 standard analyzed at 10:54 on 5/23/02 on the RTX-35 column. These were the end bracketing standards for all of the soil samples. Sample matrix was the suspected cause.

Results for Endosulfan Sulfate were reported from the RTX-35 column in samples CS-3 and CS-1 due to sample matrix interference on the DB-1701 column.

Results for Endrin Aldehyde were reported from the RTX-35 column in sample SS-1 due to sample matrix interference on the DB-1701 column.

Results for alpha-Chlordane and Endosulfan I were reported from the DB-1701 column in samples SS-6, 5536-2LCS, and 5610-2LCS due to coelution on the RTX-35 column.

Results for Dieldrin were reported from the DB-1701 column in sample SS-6 due to sample matrix interference on the RTX-35 column.

Results for 4,4-DDD and Endrin Aldehyde were reported from the RTX-35 column in sample SS-3 due to sample matrix interference on the DB-1701 column.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID – CS-3
Compound – 4,4'-DDT

$$\frac{(8138700\text{area})(10000\text{ul})}{(405091176\text{area/ng})(30.2\text{g})(1\text{ul})(0.816)} = 8.2 \text{ ug/Kg}$$

Polychlorinated Biphenyls (PCB's) - PCB samples were analyzed by GC/ECD using guidance provided in Method 8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

Samples 5610-16SBLK, CS-1, SS-5 (0.5-1'), and SS-6 required sulfur cleanup prior to analysis.

Surrogate recovery was above QC limits in 5610-16SBLK, SS-1, and SS-3 on the RTX-35 column.

The % difference for Tetrachloro-m-xylene was above QC limits in AR16603 analyzed at 01:01 on 5/23/02 on the RTX-35 column. This was the end bracketing standard for samples 5610-1MB, 5610-3LCS, SS-7 (0.25-0.75'), SS-1 and SS-3.

Manual integrations were performed if required, and any affected peaks were designated with an "M" on the quantitation report. Manual integrations were initialed by the analyst that performed the integration.

Sample Calculation:

Sample ID – CS-1
Compound – Aroclor-1242 peak 8.75 on the RTX-35 column

$$\frac{(147706\text{1area})(10000\text{ul})}{(59457790\text{area/ng})(30.6\text{g})(1\text{ul})(0.541)} = 15.01 \text{ ug/Kg}$$

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.