REMEDIAL CLOSURE REPORT

Located at

JOHNSON CONTROLS BATTERY GROUP FACILITY
Route 67A
North Bennington Road
Bennington, Vermont

Prepared for

JOHNSON CONTROLS BATTERY GROUP, INC.
5757 North Green Bay Avenue
Milwaukee, Wisconsin 53209

APRIL, 1995

Prepared by:

GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC.
Consulting Engineers & Scientists
345 North 95th Street
Milwaukee, Wisconsin 53226
(414) 259-1500

Environmental Services Division

Project No. 948724

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Site Address:

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North Bennington Road
Bennington, Vermont 05201

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Remedial measures to remove lead contaminated soil were performed by Graef, Anhalt, Schloemer & Associates Inc. (GAS) and Environmental Waste Technology (EWT) from January 1, 1995 to February 13, 1995 at the Johnson Control Battery Group, Inc. (JCBGI) facility in Bennington, Vermont. Remedial measures included the excavation of lead contaminated soil to pre-established cleanup endpoints approved by the Vermont Department of Environmental Conservation (VDEC). Those endpoints were 1,500 parts per million (ppm) lead for on-site areas and 600 ppm lead for off-site areas.

The remediation was carried out as specified in the site corrective action plan prepared by GAS and approved by the VDEC, except for two unanticipated changes as follows:

1. JCBGI is continuing discussions to allow access to the off-site wetland area directly north of the JCBGI facility. At this time, access has not been granted and no remedial measures have been taken at that location.

2. While excavating lead contaminated soil from on-site ditch line DD-3, petroleum contamination was observed and a decision was made to remove it. The petroleum contaminated soil was stabilized and landfilled off-site along with lead contaminated soil.

As excavating progressed, soil samples were collected from the excavated areas to confirm cleanup of lead to established endpoints. The effectiveness of remediation in reducing lead concentrations in soil was much greater than originally expected, based on the analytical results of confirmation samples. An average residual lead level of 125 ppm was achieved in the most highly contaminated on-site areas (railroad spur and north grassy area). Petroleum contaminated soil was removed from on-site ditch line DD-3 up to off-site ditch line DD-4. Confirmation soil samples collected from DD-3 after excavating contained no detectable total petroleum hydrocarbons (TPH). As such, successful remediation of accessible on-site and accessible off-site soil has been achieved, and JCBGI will request of the VDEC that no further investigation or remediation of lead or petroleum contamination in soil be performed at the JCBGI facility.

A third round of groundwater samples were collected during the period of soil remediation. Existing on-site and off-site water table observation wells were sampled according to VDEC

requirements. In addition, two new wells (MW-6 and MW-7) were installed in the abandoned diesel tank area to test the condition of groundwater directly downgradient to the tank excavation and within the tank excavation itself. Temporary well MW-5, which had no detectable contaminants from two previous sampling events, was abandoned. Total lead was not detected above the analytical detection limits in any well, and only trace concentrations of petroleum related compounds were detected in the abandoned diesel tank area. According to VDEC requirements, all on-site and off-site wells will be sampled once more. If groundwater impacts requiring remediation are not detected in this final round of sampling, then JCBGI recommends that no further groundwater investigations or remediation be required for the facility, and that all on-site monitoring wells be properly abandoned.

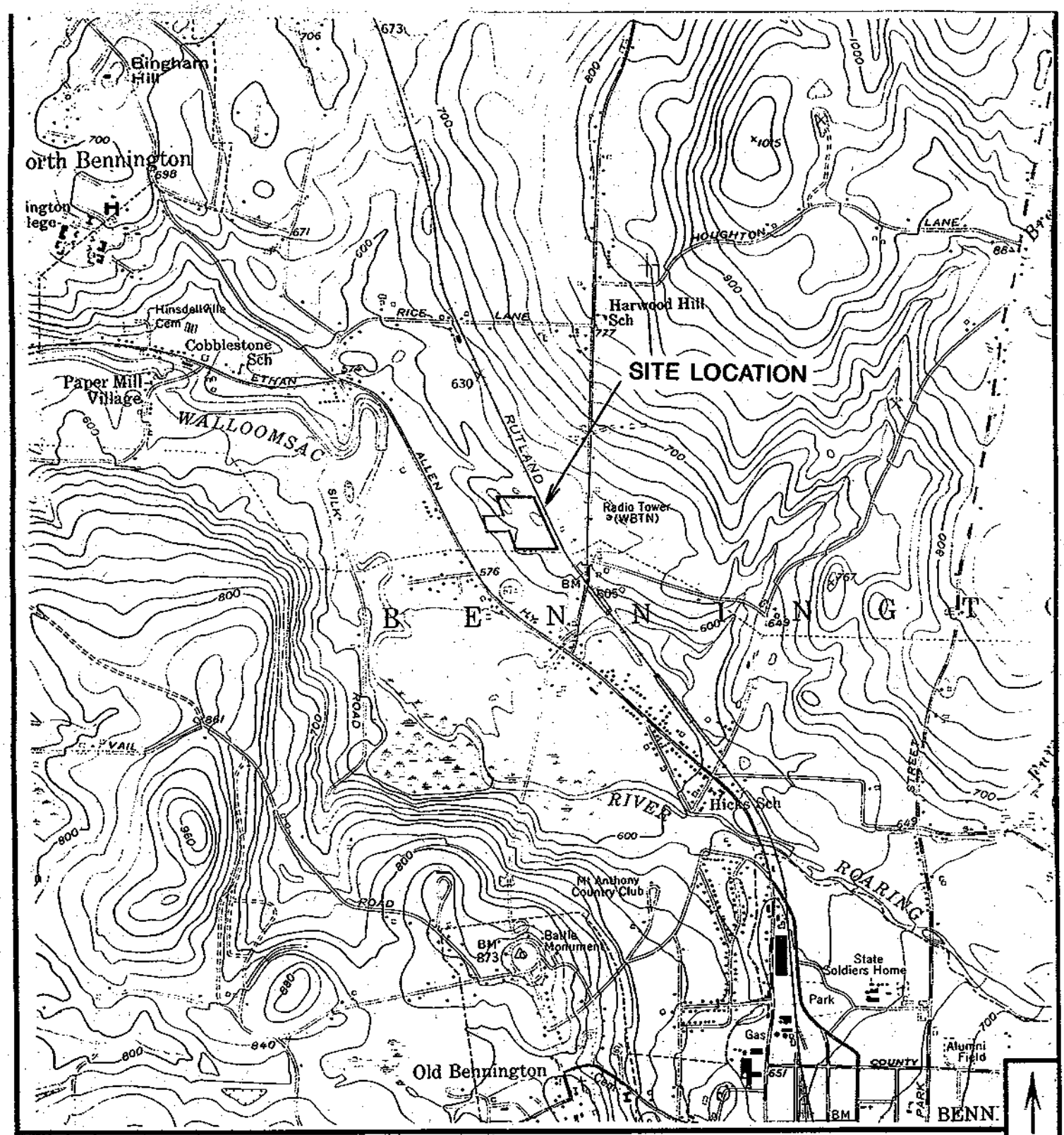
1.0 INTRODUCTION

This report documents the results of remedial activities performed at the Johnson Controls Battery Group, Inc. (JCBGI) facility located in Bennington, Vermont (Figure 1). Remedial activities were performed from January 9, 1995 to February 13, 1995, and generally involved the excavation and disposal of lead contaminated soil.

Total lead contamination in soils was investigated and delineated (see report entitled, *Site Investigation and Remedial Feasibility Study Concerning Lead Contamination in Soil*, prepared by Graef, Anhalt, Schloemer & Associates Inc. (GAS), dated October, 1994). The extent of total lead contamination was found limited to an on-site railroad spur, on- and off-site stormwater drainage ditches, and a few isolated on-site grass areas (Figure 2). The extent of lead contamination in soil was based on U.S. EPA and TSCA guidelines of 400 ppm off-site and 1,000 ppm on-site. The maximum depth of total lead contamination was determined to be three feet below ground surface (bgs).

Cleanup levels were negotiated with the Vermont Department of Environmental Conservation (VDEC) and were based on TCLP analysis of lead contaminated soil and perceived risk of human exposure. Cleanup levels of 600 ppm and 1,500 ppm were established for off-site and on-site areas, respectively. The off-site cleanup level of 600 ppm was proposed to and approved by the VDEC because of the low potential for human exposure and small volume of contaminated soil present. Also, at the time, the concentrations of off-site lead did not exceed 600 ppm. The on-site cleanup level of 1,500 ppm was proposed to and approved by the VDEC based on the results of TCLP lead analysis performed on nine soil samples collected from areas having various concentrations of lead. It was determined from the analyses that hazardous levels of lead (greater than 5 ppm TCLP lead) occurred only in areas having total lead concentrations greater than 1,500 ppm. A plan for corrective actions was prepared and approved by the VDEC which included excavating the lead contaminated soil, followed by off-site solidification / stabilization and landfilling (see report entitled, *Corrective Action Plan,* prepared by GAS and dated December, 1994).

This report also documents efforts to delineate and remediate petroleum contaminated soil resulting from the operation of an underground storage tank system which contained diesel fuel (see report entitled, *Site Investigation Report for a 10,000-Gallon Underground Diesel Fuel Storage Tank System,* prepared by GAS and dated October, 1994). Remedial



SOURCE: USGS, BENNINGTON QUADRANGLE, 7.5 MINUTE SERIES, 1954

GENERAL SITE LOCATION MAP

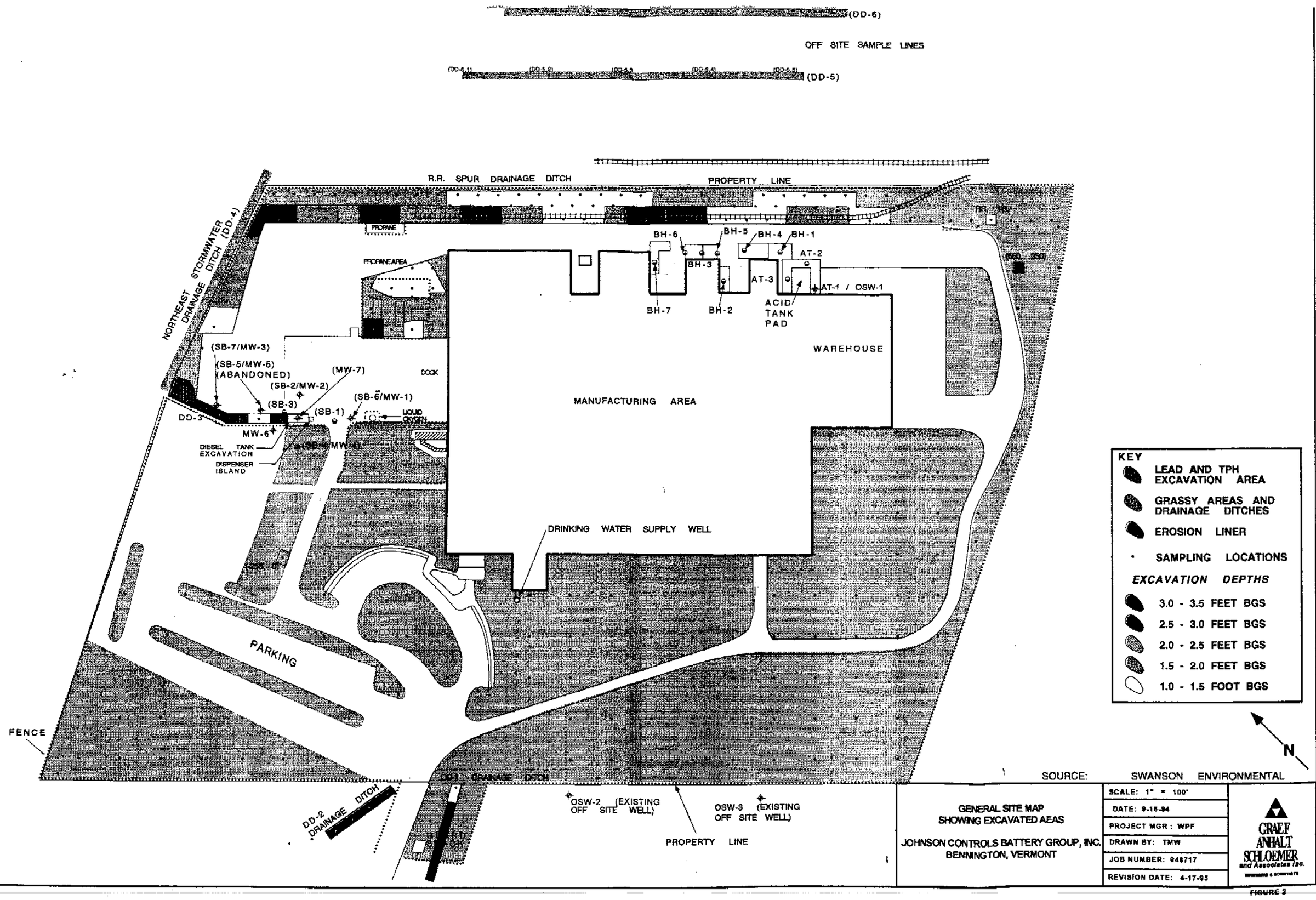
JOHNSON CONTROLS BATTERY GROUP, INC.
NORTH BENNINGTON ROAD
BENNINGTON, VERMONT

SCALE:	1" = 2000'
DATE:	10-12- 94
PROJECT MGR:	WPF
DRAWN BY:	JZ
JOB NUMBER:	948717
REVISION DATE:	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

948717.GENERAL

FIGURE 1



EXVATION.CVS

FIGURE 2

measures included excavating contaminated soil, followed by off-site solidification / stabilization and landfilling. Remedial actions were limited to on-site sections of a stormwater drainage ditch.

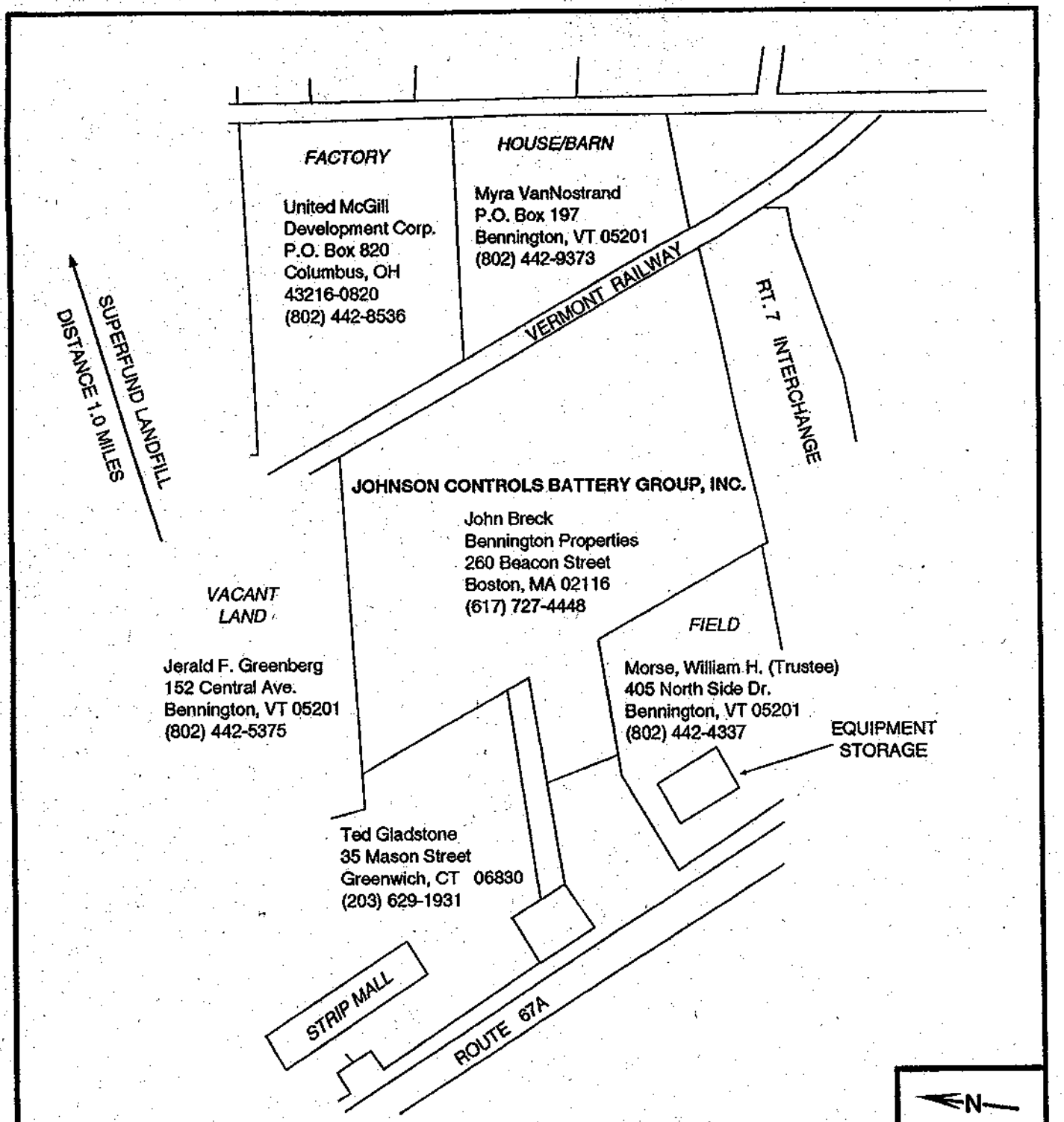
2.0 GENERAL OVERVIEW

2.1 Site History

The project site is currently owned by Mr. John Breck of Bennington Properties, Boston, Massachusetts. The site is developed with one structure, built in 1965, for use by the Johnson Controls Battery Group, Inc. According to Mr. Paul Bohnay, engineer with the City of Bennington Building Department, the current project site and all adjacent land was originally agricultural land and owned by the Elwell family. The property was purchased by Mr. William Morse in the 1950s. In the years 1961 and 1962, Mr. Morse subdivided the property into six parcels, one of which is the current project site (Figure 3).

The property adjacent to the project site to the north is owned by Mr. Jerald F. Greenburg and is currently undeveloped . The property to the northwest of the project site is owned by Gladstone Properties, and is currently occupied with one commercial structure. Southwest of the project site is property owned by Mr. William Morse, occupied with one structure used for equipment storage. Adjacent to the site to the northeast is United McGill Development Corp. property with one industrial structure used for manufacturing heating, ventilating, and air conditioning (HVAC) systems. Ms. Myra VanNostrand is the owner of the property to the southeast of the project site, occupied with one residential and multiple agricultural structures. The Route 7 Interchange borders the project site to the south (Figure 3).

The Vermont Hazardous Sites List, for the Third Quarter of 1994, was reviewed for information pertaining to potential sources of contamination within one mile of the project site. One site was found within that distance, the former Bennington Landfill, which was identified as a National Priorities List Superfund site. According to Mr. Stan Comeille, project manager at the VDEC, the contaminants and their extent at the Bennington Landfill site has been identified and defined, and those contaminants do not appear to have migrated from the Bennington Landfill property to any adjacent properties.



ADJACENT PARCEL LOCATION MAP

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE:	N.T.S.
DATE:	10-13-94
PROJECT MGR:	WPF
DRAWN BY:	MJP
JOB NUMBER:	948717
REVISION DATE:	10-24-94

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

948717.D5 ADJ PAR

FIGURE 3

Over the course of the plant's operations, several releases of lead slurry, lead oxide, and dilute sulfuric acid have taken place on site. Cleanup measures to the extent practical were performed at the time of the release. On-site storage of hazardous materials consisted of 55-gallon drums of lead-oxide sludge which were occasionally stored temporarily outside along the east side of the building prior to off-site shipment for recycling. The waste was transported by rail in the 1960s and then later by truck. Diesel fuel was stored in underground tanks at one location in the northeast portion of the site (Figure 2). A 10,000-gallon tank was removed and replaced with a new tank of similar size and construction in 1989. In September, 1994, the existing 10,000-gallon tank was removed and the underground storage of diesel fuel was discontinued.

2.2 Regional Geology

The site is located in the Vermont Valley, which is situated between the Taconic Range (to the west) and the Green Mountains (to the east), in the extreme southwest corner of the state, near the borders of Massachusetts and New York. The valley is a result of former tectonic activity associated with the late Ordovician Taconic Orogeny, which is best expressed in the northern Appalachians and continues northward to Canada. The valley was further defined by Pleistocene glaciation, and served as a major proglacial and glaciolacustrine drainageway. The site is located on the valley floor, elevation 630 feet mean sea level (MSL), and the surrounding uplands rise to 2,300 feet MSL at Mt. Anthony to the southwest, and to 2,857 feet MSL at Bald Mountain to the east.

2.2.1 Bedrock

Bedrock stratigraphy in the area is complex, as a result of the extensive folding, faulting, and thrust events associated with tectonic activity. Structurally, the site is located in the Foreland area of the Middlebury Synclinorium (cross-section line F-F', Doll, 1961), slightly east of the Maple Hill Thrust Fault, where the Foreland and the Green Mountain Anticlinorium meet. Bedrock in the synclinorium is Cambrian and Ordovician sediments and metasediments. According to information on local water-supply well logs, the depth to bedrock is highly variable within a one mile radius of the site. The depth to bedrock in wells near the site varies between 20 to 40 feet bgs.

Bedrock at the site is the middle Cambrian Age Winooski dolomite, characterized as buff-weathered pink, buff and gray dolomite; formation beds are four inches to one foot thick

separated by thin protruding red, pink, green, and black siliceous partings. East of the site is the Monkton Quartzite (lower Cambrian Age) and the Dunham dolomite. The Monkton formation is described as distinctively red quartzite interbedded with lesser buff and white quartzite and relatively thick sections of dolomite similar to the Winooski. The Dunham formation is also a buff-weathered siliceous dolomite, which is pink and cream mottled or buff to gray on fresh surfaces. The lower Dunham is massive, whereas the upper part is sandy and resembles the Winooski. West of the site are the Clarendon Springs, Ticonderoga and Rock River dolomites (upper Cambrian), which are fairly uniform, smooth-weathered gray dolomites with numerous geodes and lenses of white quartz and quartz sandstone, with masses of chert near the top of the formation.

2.2.2 Glacial Geology

Surficial unconsolidated glacial units in Vermont are classified into three major units: the Burlington, the Shelburne, and the Bennington tills. The Burlington till unit and associated outwash and lacustrine units are found in the northwest and north-central parts of the state, in the approximate former location of Glacial Lakes Vermont and Burlington. The Shelburne till and associated deposits are located over the greatest part of the state, and along the entire east border. Lastly, the Bennington unit is only found in the extreme southwest corner of the state.

Sediments at the site are Bennington outwash and related glaciofluvial and ice contact deposits such as kames, kame moraines, and glaciolacustrine sands. Small, isolated discontinuous deposits of recent fluvial alluvium occur up and down the Vermont valley near the site. Numerous sand and gravel quarry operations are located near the site, as outwash sands and gravels are mined for aggregate. Bennington till mantles the bedrock and mimics the bedrock topography on the surrounding uplands. Till units are thickest in the valleys, and thinnest on uplands, where post-glacial erosion and mass wasting have eroded the tills. Approximately 20 to 40 feet of till overlays the bedrock surface beneath the site.

2.2.3 Soils

Soils at the site are Windsor Series loamy fine sand with 0 to 8 percent slopes (Figure 4). The Windsor Series consists of deep, excessively drained soils formed on outwash and lacustrine terraces. The subsoil from 2 to 20 inches is strong brown and yellowish-brown loamy sand, and light yellowish-brown sand from 20 to 24 inches. The substratum from 24

18A = Windsor Loamy fine sand; 0-8% slopes
27 = Udipsamments & Udorthents; gently sloping
66C = Georgia Loam; 8-15% slopes; stony
68A = Massena silt loam; 0-3% slopes; stony
69B = Massena silt loam; 3-8% slopes; very stony

N

SOURCE: SOIL CONSERVATION SERVICE, BENNINGTON COUNTY, VERMONT SOIL SURVEY

SCS SOILS MAP

JOHNSON CONTROLS BATTERY GROUP, INC.
NORTH BENNINGTON ROAD
BENNINGTON, VERMONT

SCALE:	1" = 1667'
DATE:	10-17-94
PROJECT MGR:	WPF
DRAWN BY:	JZ
JOB NUMBER:	948717
REVISION DATE:	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS&SCIENTISTS

948717.SOIL

FIGURE 4

to 60 inches is pale brown and light brownish-gray sand. Soil pH values range from 4.5 to 6.0 standard units (SU) from 0 to 20 inches, and from 4.5 to 6.5 SU from 20 to 60 inches deep.

Surrounding the site are areas of Georgia loam, Massena silt loam, and fill areas of udipsamments and udorthents. A small strip of Georgia loam soil is located immediately to the west of the site. The Georgia soil consists of very deep, moderately well drained soil formed in glacial till on uplands. The eight-inch surface layer is very dark grayish brown loam. The subsoil from 8 to 24 inches is brown loam, from 14 to 21 inches is mottled brown loam, and from 21 to 26 inches is mottled olive brown loam. The substratum is mottled, gray to light olive brown loam from 26 to 60 inches. Soil pH ranges from 5.1 to 7.3 SU throughout the solum (Figure 4).

Massena silt loams are found to the north and east of the site along the rail line. Massena silt loams are deep, somewhat poorly drained soils formed in glacial till on uplands. Some soils are very stony. The surface layer, approximately nine inches thick, is very dark grayish brown gravely loam. The mottled subsoil from 9 to 30 inches is brown gravely fine sandy loam. The substratum is mottled from 30 to 60 inches, and is grayish brown, very firm, gravely fine sandy loam. Soil pH values range from 5.6 to 7.3 SU from 0 to 30 inches, and from 6.6 to 8.4 SU from 30 to 60 inches deep.

West of the site along Highway 67A, near the strip mall (Figure 3), and to the south are areas of fill land. No specific soil description is provided; an on-site study is necessary to adequately describe the soils. Generally, the soils are udipsamments and udorthents (Entisols). Entisols are recent soils with limited soil horizonation. Psamments are well-drained sands and coarser sands, whereas orthents are well-drained loamy clayey entisols. The prefix "udic" refers to the soil moisture regime, where soils are not dry for 90 consecutive days. No pH information is available for fill soils.

2.3 Regional Hydrogeology

2.3.1 Hydrogeology

The major aquifers in the area are the unconsolidated sand and gravel (glacial) aquifer and the bedrock aquifer. The glacial aquifer consists of isolated, discontinuous discrete units of sand and gravel, and is hydraulically connected to the bedrock aquifer. The bedrock aquifer

is the Winooski dolomite, described earlier. The water table at the site is in the unconsolidated deposits at 2 to 4 feet bgs. This water table may be locally perched; however, deeper site sediment information is not available to verify these conditions. The unconfined bedrock aquifer is used locally for drinking water supplies. According to local well logs, the bedrock aquifer is encountered between 20 to 40 feet bgs near the site. Static water levels within nearby wells are near the bedrock surface.

2.3.2 Hydrology

The area's major surface water feature is the Walloomsac River, which originates in the Green Mountains as Walloomsac Creek and the South Branch, and flows westward down into the Vermont Valley and continues westward into New York State. A series of flow-through lakes and rivers (Lake Paran and three unnamed lakes) originate to the north of Bennington and flow southward merging with the Walloomsac River near the state line. The present Walloomsac River is underfit for the size of the modern valley, and numerous scattered wetland areas occur on the floodplains on either side of the river. The site is located approximately one-half mile east of the Walloomsac River. Two on-site stormwater drainage ditches drain off-site towards Highway 67A. Under conditions of heavy storm water discharge, the drainage water may enter ditches along the highway and eventually empty to the Walloomsac River.

2.4 Site Investigation / Feasibility Study

From October 3 through October 7, 1994, GAS performed site investigations to determine the extent and magnitude of lead contamination at the JCBGI facility. The investigations followed a pre-described scope of work prepared by JCBGI and the VDEC. In general, the scope of work included a grid system soil boring plan in all on-site grass areas, lines of borings with variable spacing along on-site and off-site segments of storm water drainage ditches, lines of borings along both sides of an on-site railroad spur, and two lines of borings in off-site grassy areas to the east of the site (Figure 2).

The results of laboratory analysis indicated that lead contamination in soil was generally limited to on-site areas (Figure 2). Lead contamination above 1,000 ppm was found to be concentrated in two main areas: grass areas adjacent to paved areas in the northeast corner of the site; and the railroad spur embankment adjacent to paved areas on the east side of the facility. The on-site segments of storm water drainage ditches contained elevated lead levels

(greater than 1,000 ppm) for only a short distance from the outfalls. Off-site concentrations of lead greater than 400 ppm were limited to sections of stormwater drainage ditches located at the outfall. The concentrations of lead decreased dramatically with distance from the outfalls. There were other detections of lead (greater than 1,000 ppm) in miscellaneous grassy areas on-site; however, they were few and scattered, and occurred alongside paved areas.

Soil across the area of investigation was identified as organic silt loam to 1.0 feet bgs, followed by sandy silt to silty fine sand. This type of sediment is of low permeability (ability to transfer water) and has high adsorptive characteristics (ability to retain contaminants). These soil characteristics were apparently effective in limiting the vertical migration of contaminants to 2.5 to 3.0 feet bgs. The vast majority of contamination was found limited to the upper six inches to 1.5 feet of soil in all contaminated areas. Groundwater samples were collected from six on-site monitoring wells, an on-site drinking water supply well (Figure 2), and two off-site monitoring wells. Lead was not detected in any on-site well. One off-site well had a detectable concentration of lead (0.004 ppm). However, the concentration was below the federal action level of 15 ppb for lead.

A remedial feasibility study was conducted to address the viable options for site remediation. The factors considered for each soil remediation alternative included: desired remediation endpoint, duration of remedial activity, cost, and post-closure care considerations. Remedial alternatives considered at the site included: "no action," excavation and disposal at a RCRA TSDF (Subtitle C landfill), ex-situ soil washing, excavation and disposal at a permitted landfill (Subtitle D facility), in-situ solidification / stabilization (S/S), low permeability capping, and mechanical soil tilling. In addition, combined technologies were also considered due to varied site conditions which included accessibility and the ranges of soil lead concentrations. The remedial combinations evaluated were capping in conjunction with excavation / disposal and in-situ S/S and mechanical soil tilling in conjunction with the various excavation / disposal options.

Based strictly on costs, capping was the most cost effective option; however, because of the time required for regulatory approval of the cap design and the significant post-closure groundwater monitoring requirement, the option was not considered viable. In-situ S/S was also very cost-effective to implement; however, as with capping, significant time constraints related to regulatory approval and post-closure groundwater monitoring made this alternative undesirable. Ex-situ soil washing was eliminated as a viable option primarily due to RCRA

treatment / storage permitting issues and because the process creates additional waste streams. Mechanical soil tilling was eliminated as a single application method at the site; however, it was considered a viable supplement to other methods.

Only excavation and disposal of contaminated soil at either a Subtitle C or D landfill was considered as viable for meeting both the remedial goals and eliminating the post-closure care requirements. While both of these alternatives exhibited the highest cost, disposal at a Subtitle D landfill (non-hazardous waste) was considered the most cost effective. However, this alternative requires on-site solidification / stabilization of the soil prior to disposal and a RCRA permit for on-site treatment. This option was eliminated due to the costly and lengthy permit process.

JCBGI ultimately chose excavation and landfill at a RCRA Subtitle C facility (all other remedial options were eliminated due to time constraints). Prior to landfilling, the waste was solidified / stabilized at the Subtitle C facility. Specific details of the remediation process were documented by GAS and submitted to the VDEC as a corrective action plan.

2.5 Site Corrective Action Plan

GAS prepared a Corrective Action Plan (CAP), dated November, 1994 which was submitted to the VDEC for their review. A Corrective Action Plan Addendum, dated December, 1994, was then prepared by GAS and submitted to the VDEC in response to comments they had concerning the initial document.

As described in the CAP, the technology selected by JCBGI for mitigation of the lead contaminated soils at the site was through excavation to appropriate cleanup endpoints and landfill disposal. This conclusion was based upon cost and time frame to implement complete closure. Based on the perceived risk of human exposure at the site and the results of soil analysis performed using the toxic characteristic leaching procedure (TCLP), cleanup endpoints of 600 ppm and 1,500 ppm total lead were established for off-site and on-site areas, respectively. The off-site cleanup level of 600 ppm was proposed to and approved by the VDEC because of the low potential for human exposure and small volume of contaminated soil present. Also, at the time, the concentrations of off-site lead did not exceed 600 ppm. The on-site cleanup level of 1,500 ppm was proposed to and approved by the VDEC based on the results of TCLP lead analysis performed on nine soil samples collected from areas having various concentrations of lead. It was determined from the analyses that

hazardous levels of lead (greater than 5 ppm TCLP lead) occurred only in areas having total lead concentrations greater than 1,500 ppm. The CAP contained a description of the lateral limits and depth of excavation in all areas where contaminated soil was to be removed (Figure 2).

Based upon the results of the site investigation and remedial feasibility study, remediation of lead or petroleum in groundwater was not deemed necessary, since lead contamination was not detected at concentrations exceeding the federal action levels and only minimal concentrations of volatile organic compounds were detected in MW-1, and to a much lesser degree in OSW-1. Instead, the VDEC agreed to three additional rounds of groundwater monitoring.

2.6 Remediation Contractor and Subcontractors

Bids and specifications for remediation were sent to select remediation and/or abatement contractors. The contract for remediation was awarded to Environmental Waste Technology, Incorporated (EWT) of Newton Upper Falls, Massachusetts based on their qualifications and bid price. The following is a list of subcontractors used by EWT and their specific responsibilities:

Demeter, Inc.	Manchester,MA	Equipment and Operators
Zecco Inc.	Northboro, MA	Labor
Burgess Brothers Inc.	Bennington, VT	Equipment & Operators
Dart Trucking	Canfield, OH	Trucking
Buffalo Fuels Corp.	Niagara Falls, NY	Trucking
Frank's Vac. Trk. Srvc. Inc.	Niagara Falls, NY	Trucking
Page E.T.C. Inc.	Weedsport, NY	Trucking

Lead and petroleum contaminated soil was excavated and transported to City Environmental, Inc., Detroit, Michigan (EPA # MID9880991566) for stabilization and landfilling. Groundwater, stormwater contacting excavated areas, and decontamination waters that were disposed of off-site were accepted at Dupont Environmental Treatment Services, Deepwater, New Jersey (EPA # NJD002385730).

2.7 Health and Safety Considerations

In accordance with the requirements of OSHA 1910.120 and 1910.1025, a site-specific Health and Safety Plan (HASP) was developed by both GAS and EWT for use by their personnel. Items that were addressed in the plan included: site information (contacts, utility, police and fire department phone numbers), standard operating procedures, air monitoring, personal protective equipment (PPE), health surveillance program, employee education and training, and contingency / emergency response plan. A copy of the HASP is included in Appendix B.

The principle hazard involved with remediation was the exposure to and/or contact with lead. To reduce exposure, an exclusion zone, contaminant reduction (decon) zone, and support zone were established as outlined later in this report. All personnel entering the exclusion zone and contaminant reduction zone were required to don EPA Level C PPE as outlined in the HASP. All EWT, GAS, and subcontractor personnel were required to have OSHA 40-hour HAZWOPER training and abide by procedures outlined in the HASPs.

2.8 Site Groundwater Monitoring

To satisfy VDEC requirements for additional groundwater monitoring, groundwater samples were collected from on-site monitoring wells MW-1 through MW-4, OSW-1, and off-site monitoring wells OSW-2 and OSW-3. In addition, to better determine the extent of petroleum impacts to groundwater, two new wells (MW-6 and MW-7) were installed near the old (removed) diesel tank (Figure 2). MW-6 was installed directly downgradient of groundwater flow to the tank excavation, and MW-7 was installed within the tank excavation backfill. These new wells were developed two days prior to sampling (see Well Construction and Development Logs in Appendix C). Temporary well MW-5 was abandoned properly and not sampled in January. This well did not have detections of lead, petroleum, or VOC contaminants in two previous sampling events (see Well Abandonment Form in Appendix C).

Prior to sample collection, four well-casing volumes of water were purged from each well. The groundwater samples were collected using disposable polyethylene bailers. Sampling personnel wore nitrile sampling gloves, and followed applicable collection guidelines. Physical and chemical groundwater parameters, including pH, conductivity, temperature,

color, odor, and turbidity, were noted during sampling (see Groundwater Sampling Logs in Appendix C).

Groundwater samples for field filtered lead were collected in one liter amber bottles for transportation to the analytical laboratory. Samples for lead analysis were filtered in the field using 45-micron disposable filters and preserved with nitric acid. Samples for VOC and TPH analysis were collected in 40-ml VOA and one liter amber bottles, filled with no headspace and preserved with hydrochloric acid. All sample containers were maintained on ice at a temperature of 4°C for shipment to the laboratory. Standard chain-of-custody procedures were followed.

As can be seen on Table 1, water samples collected from on-site and off-site monitoring wells have not contained lead in concentrations above federal action levels over the past three monitoring events. Trace concentrations of petroleum compounds and petroleum related VOCs have been detected in various monitoring wells located near the removed (September, 1994) diesel tank. The detected petroleum VOCs are all below federal action levels, including those detected in MW-7, which was recently installed within the tank backfill. Monitoring well MW-1, which is upgradient to the direction of groundwater flow in the diesel tank area, has had persistent detections of 1,1-dichloroethene at concentrations just exceeding the federal action levels of 0.007 ppm and occasional detections of 1,1,1-trichloroethane and 1,1-dichloroethene at concentrations just below the federal action levels for these compounds. These VOCs are not considered related to the diesel tank.

3.0 PRE-CONSTRUCTION ACTIVITIES

3.1 Establishing Work Zones

Prior to excavating, as required in the GAS bid specifications and the contractor HASP, the following work zones were established and/or defined: exclusion zone, contamination reduction (decon) area, staging area, and field office.

The exclusion zone encompassed the active work area, contaminated material staging area, and truck loading area. The staging area and truck loading area was situated on the concrete apron of the plant loading bays. This area was bounded by a short fence line and the DD-3 ditch line to the west, the property boundary fence to the north, and the east property boundary fence line (Figure 5).

TABLE 1

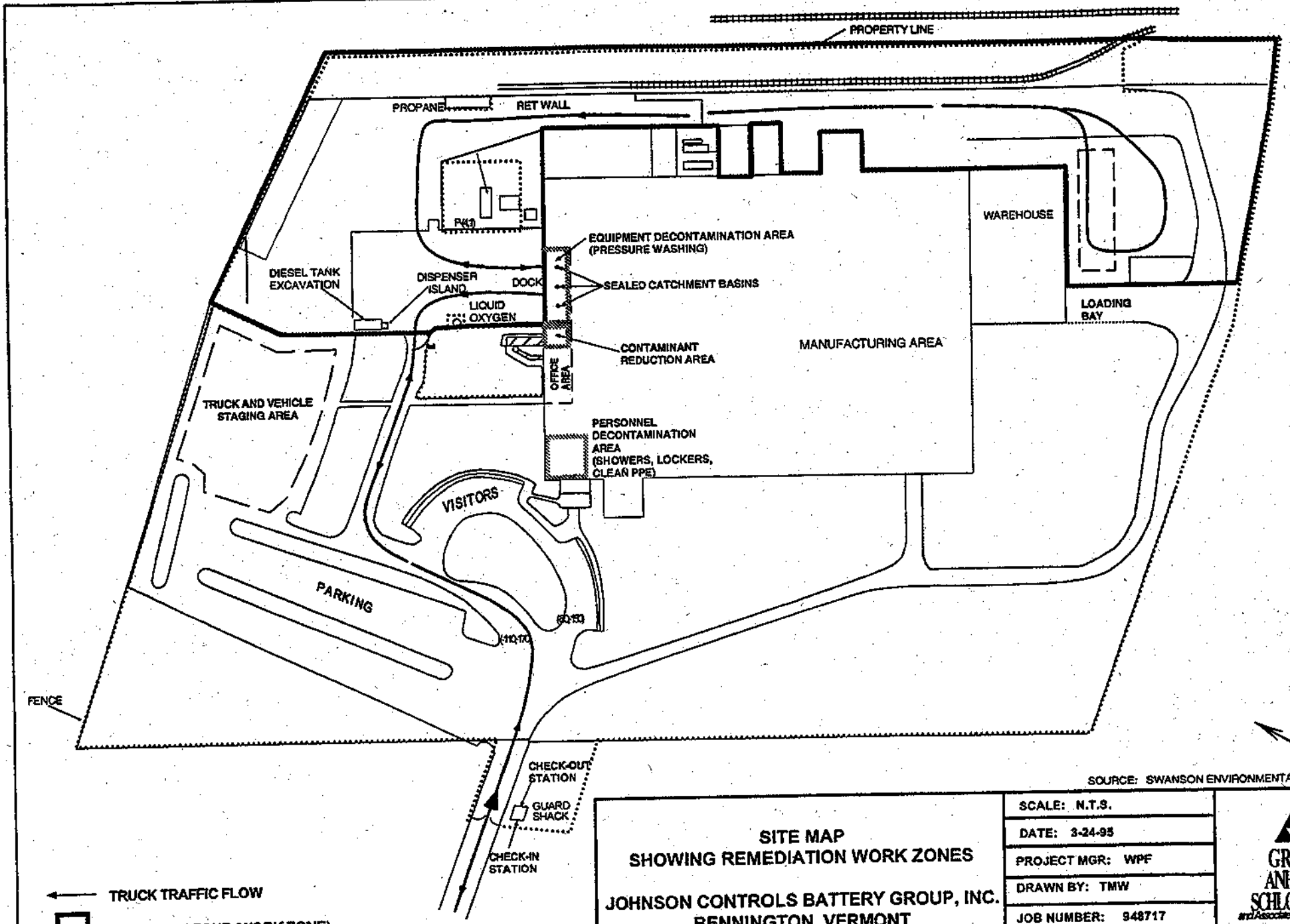
GROUNDWATER ANALYTICAL RESULTS

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

(ALL RESULTS REPORTED IN PARTS PER MILLION)

		OFF SITE WELLS									DIESEL UST AREA WELLS																
		OSW-1			OSW-2			OSW-3			MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		MW-7	
	PQL																												
DATE SAMPLED		10/7/94	12/7/94	1/25/95	10/7/94	12/7/94	1/26/95	10/7/94	12/7/94	1/25/95	10/7/94	12/7/94	1/25/95	10/7/94	12/7/94	1/25/95	10/7/94	12/7/94	1/25/95	10/7/94	12/7/94	1/25/95	10/7/94	12/10/94	Abandoned 1/95	12/12/94	1/25/95	12/12/94	1/26/95 1/95
TOTAL LEAD *EPA Method 200.7 or 329.2*	0.003	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	NA	NA	<0.003	NA	NA	<0.003	NA	NA	<0.003	NA	NA	<0.003	NA		NA	NA	NA	NA
MODIFIED TPH GRO (Gasoline Range Organics)	0.10	<0.10			NA	NA	NA	NA	NA	NA		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10		
DRO (Diesel Range Organics) *EPA Method 8015*	0.10	<0.10	<0.10	<0.10	NA	NA	NA	NA	NA	NA		<0.10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10		
VOLATILE ORGANIC COMPOUNDS *(VOCs) EPA Method 8240*																													
Acetone	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	A	<0.010	<0.010	<0.010	<0.010
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	B	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A	NA	NA	NA	NA
Benzene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	N	<0.005	<0.005	<0.005	<0.005
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	D	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	O	NA	NA	NA	NA
4-Bromofluorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	NA	NA	NA
Bromoform	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	E	<0.005	<0.005	<0.005	<0.005
Bromomethane	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	D	<0.010	<0.010	<0.010	<0.010
2-Butanone	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010
Carbon Disulfide	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Carbon Tetrachloride	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Chlorodibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Chloroethane	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010
2-Chloroethyl Vinyl Ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Chloroform	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
1,4-Dichloro-2-butane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
1,1-Dichloroethane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
cis-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
trans-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,4-Difluorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Ethanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Ethylbenzene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005		
Ethyl Methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
2-Hexanone	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
4-Methyl-2-pentanone	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010
Styrene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Tetrachloroethene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005		<0.005	<0.005	NA	NA	NA	NA	NA	NA				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
1,1,2-Trichloroethane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Trichloroethene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Vinyl Acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
Vinyl Chloride	0.010	<0.010	<0.010	<0.010	NA	NA	NA	NA	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010
Xylene	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005

PQL = Practical Quantitation Limit (The Lowest Concentration Which Can Be Reliably Quantified)
TPH = Total Petroleum Hydrocarbons
NA = Not Analyzed
= *Detection Above PQL*



SOURCE: SWANSON ENVIRONMENTAL

SITE MAP
SHOWING REMEDIATION WORK ZONES

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE:	N.T.S.
DATE:	3-24-95
PROJECT MGR:	WPF
DRAWN BY:	TMW
JOB NUMBER:	948717
REVISION DATE:	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

FIGURE 5

AREAS.CVS

Over-the-road material hauling trucks were loaded at the entrance to the exclusion zone. The active work zone was connected to and shared a common boundary with this area. Initially, the active work zone was bordered by the north property fence, the east property fence and a line of caution tape and temporary fencing that was extended from the end of the plant building to the east property fence, and the east side of the plant building. This area connected the loading and staging area north of the plant in the northeast corner of the property (Figure 5). The exclusion zone was reduced as excavating work progressed northward along the railroad spur so that restoration could be performed outside the exclusion zone.

The contamination reduction / decontamination area for equipment and personnel was established in the loading bay areas located at the north end of the plant building. The excavating equipment, on-site haul trucks, and other miscellaneous equipment were decontaminated in this area by physically removing soil combined with pressure washing, as necessary. The catchment basins in the floor were seated to collect any wash water. This wastewater was then pumped to the contractor's mobile holding tanks as necessary. The mobile wastewater holding tanks were staged inside this area to protect them from freezing temperatures.

The personal decontamination area was accessed through the contamination reduction area, by entering the plant and proceeding west along an aisle to a locker/shower room. Receptacles for disposable PPE and an area for storage of reusable PPE and supplies were provided. A washbasin and showers were also available at this location. This room exited to the field office where breaks were taken and day-to-day site management was performed. A separate entrance/exit for this area led to an outside area located away from the exclusion zone.

A contaminated material staging area was designated in the northwest corner of the paved loading bay area (Figure 5). A containment berm was constructed by laying down 6 mil polyethylene plastic (poly), placing backfill material in a row 2.5 feet wide by 1.5-2.0 feet high the required length, and covering the backfill with poly (seams were kept to inside of the containment area). The size of the containment area was modified daily to accommodate the amount of soil in the stockpile. In addition, the stockpile was covered with poly at the end of each working day.

In order to document the progress of the excavation, control points were established along the east property boundary, north property boundary, and DD-3 ditch line fencing by designating stations every 100 feet and dividing these into 25-foot sections. These points were clearly marked on the property boundary fencing. The stationing for the east and north property boundaries originated at the northeast property corner (corner fence post) which was designated 0+00. The stations along the east boundary were designated 1+00, 2+00, 3+00 etc., the stations along the north property boundary were designated N - 1+00, N - 2+00 etc., and the stations along the DD-3 drainage (whose origin was at the intersection of this ditch with the north property fence) were designated (DD-3) 1+00, (DD-3) 2+00 etc.

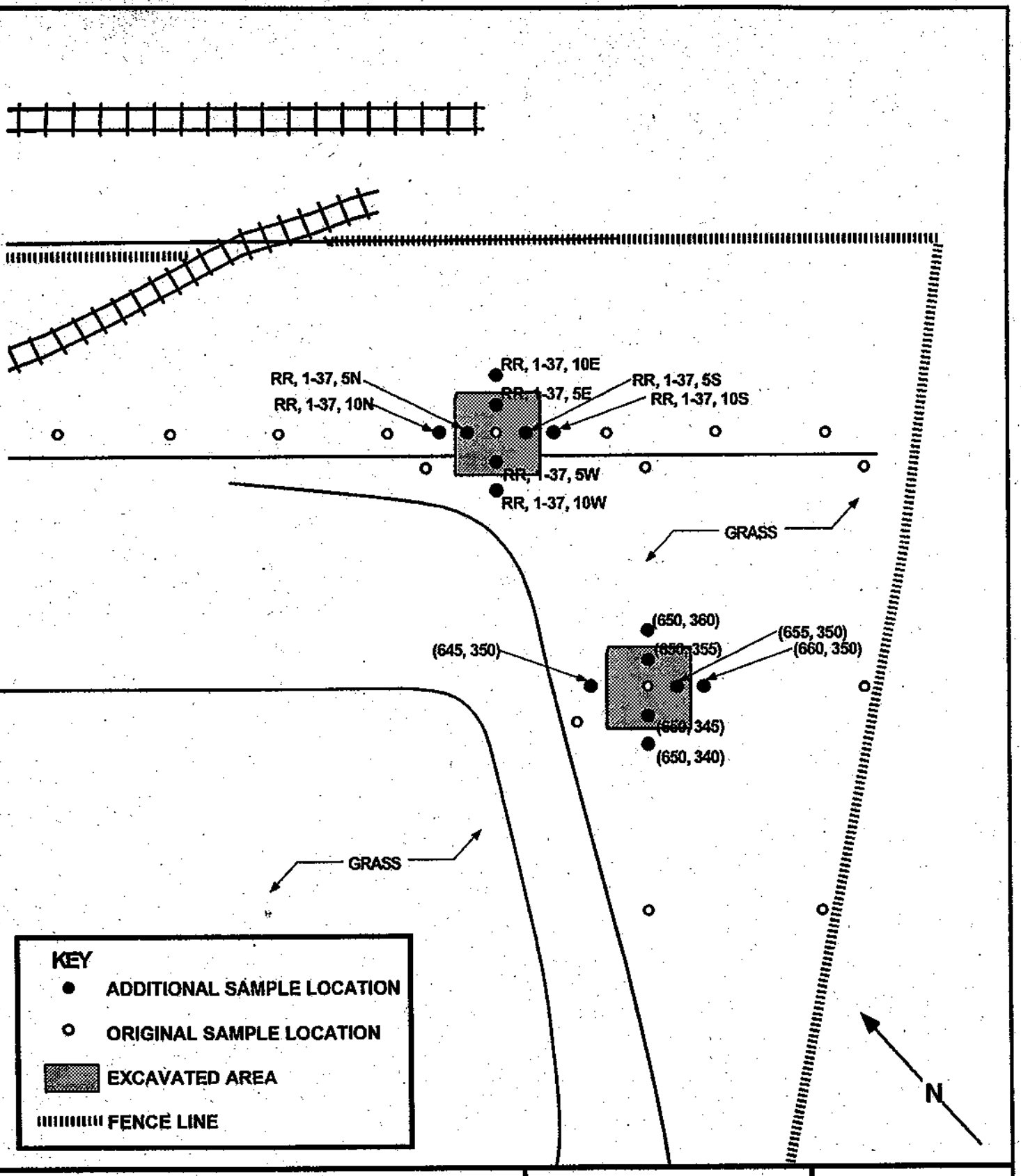
An elevation benchmark, referenced to USGS datum, was established on site at the concrete base of the former diesel dispenser in December, 1994 by a local surveyor. This elevation data was used to establish temporary benchmarks every 200 feet along the east side of the plant building. These control points and benchmarks were used for horizontal and vertical control of the excavation.

3.2 Pre-Excavation Sampling

Prior to excavating, certain isolated areas of lead contamination were sampled to more accurately define the lateral extent of material to be removed. These areas contained lead concentrations which were above both on-site and off-site cleanup thresholds. These areas included: RR-1,37, (650,350), (-255,0), the propane tank area, and DD-4,1 (Figure 2). Where isolated single points had levels above clean-up endpoints, additional samples were collected at a radius of five (5) feet and ten (10) feet extending out in all four compass directions (Figures 6 and 7). The samples were collected from the depth interval that had previously exhibited the highest concentration. Based on analytical results, the lateral limits of the excavation were extended outward to points where lead concentrations fell below established cleanup endpoints.

There were three separate sections of the propane tank area which contained lead concentrations above the on-site cleanup endpoints. The extent of lead contamination in each section was delineated by: paved surfaces, sample points below on site thresholds, or additional sampling points located twelve (12) feet west from the original sample points.

Samples were collected by manually driving a split spoon sampler to the desired depth. After extracting the sampler from the ground, the split-barrel sampler was opened and



PRE-EXCAVATION SAMPLING LOCATIONS
ISOLATED AREAS (650, 350) AND
RR-1, 37

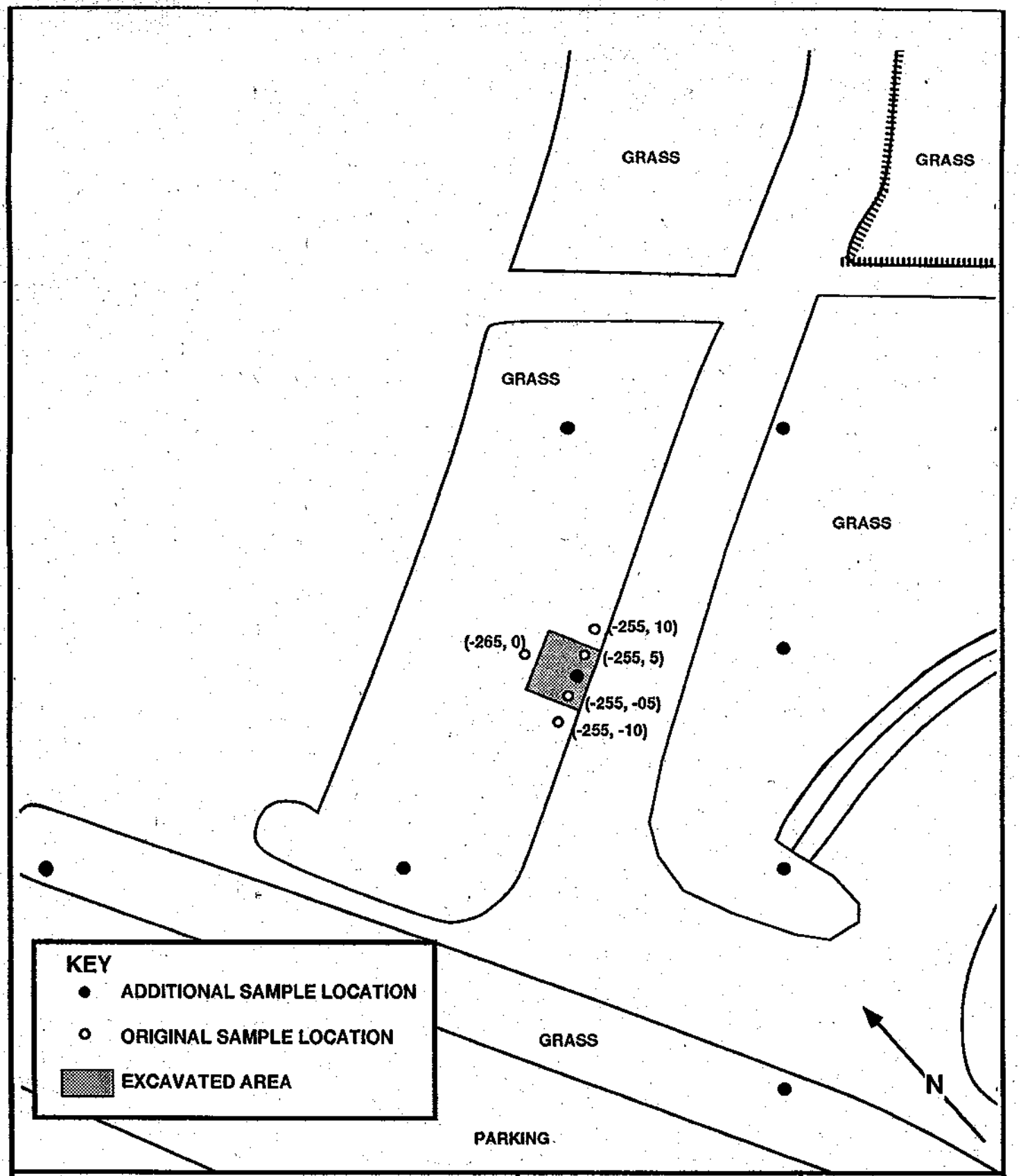
JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE: 1"=30'
DATE: 3-20-95
PROJECT MGR: WPF
DRAWN BY: TMW
JOB NUMBER: 948724
REVISION DATE:

GRAEF ANHALT SCHLOEMER and Associates Inc.

MAP4.CVS

FIGURE 6



PRE-EXCAVATION SAMPLING LOCATIONS
ISOLATED AREA (-255, 0)

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE:	1"=30'
DATE:	3-20-95
PROJECT MGR:	WPF
DRAWN BY:	TMW
JOB NUMBER:	948724
REVISION DATE:	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

MAP4.CVS

FIGURE 7

samples were collected. Samples were placed in containers provided by the laboratory using a stainless steel spatula. Soil samples were labeled in the field by corresponding sample location number and the depth interval from which they were collected. The samples were shipped to the laboratory, accompanied by chain-of-custody documentation. Per VDEC requirements, one duplicate sample was collected for every 20 samples submitted to the laboratory.

The sampling equipment, split-barrel sampler, and stainless steel spatula were decontaminated between sampling locations. The decontamination procedure involved washing the samplers in an aqueous solution of TSP (phosphate free) and rinsing in potable water.

3.3 Delineation of Areas of Excavation

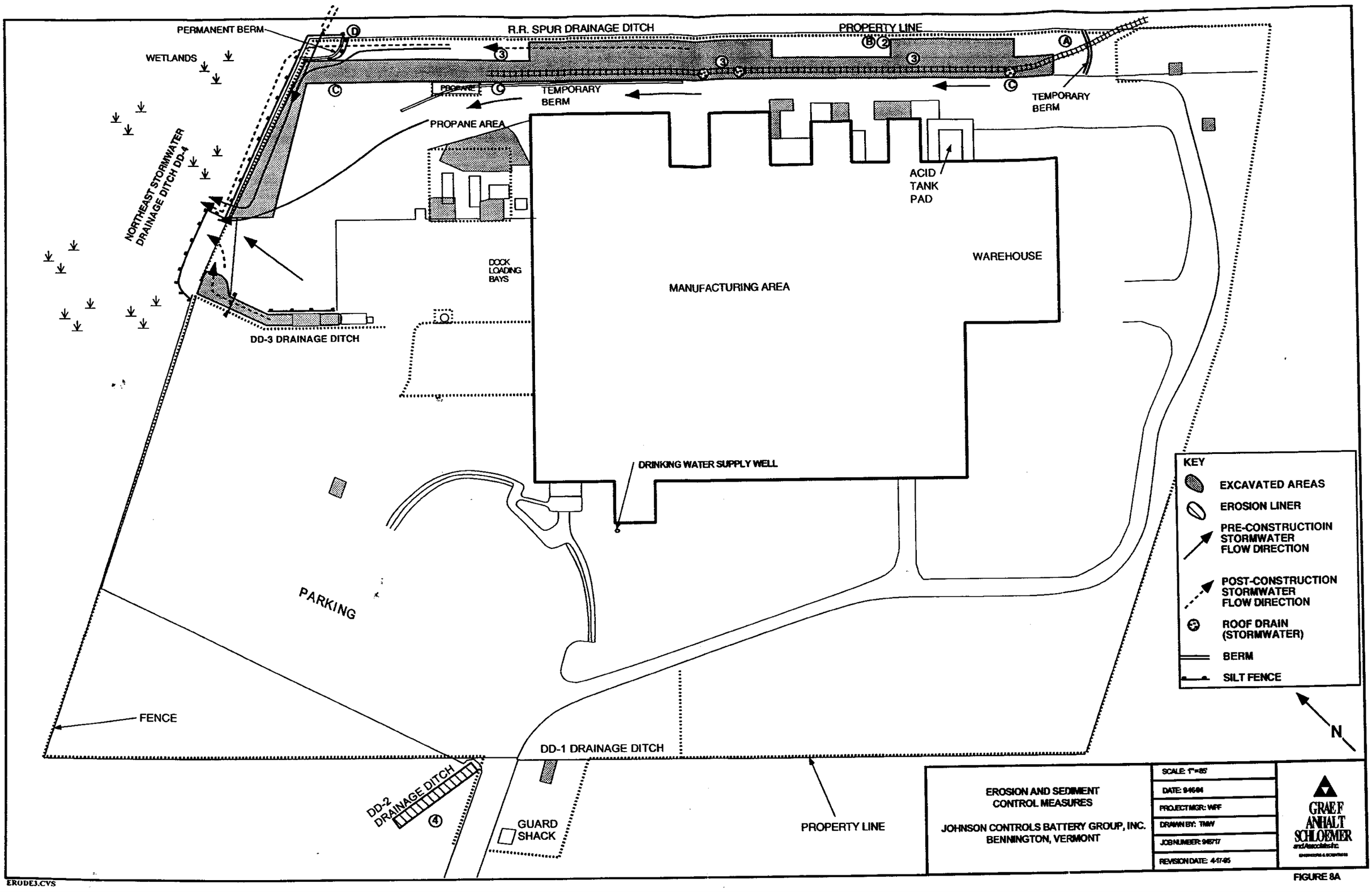
The baghouse areas requiring excavation were defined by paved areas, the plant building and sample locations below on-site thresholds. These areas were flagged and their limits were outlined with marking paint. In the drainage ditch area (DD-1), lead contamination was limited to deposition along the base of the ditch. Therefore the area to be excavated included the width of the drainage ditch along a 25-foot segment up to sample point DD-1,2, which contained a lead concentration below established cleanup endpoints.

3.4 Pre-Excavation Erosion and Sediment Control Measures

Prior to excavating, erosion and sediment control measures were implemented to prevent the migration of sediment into uncontaminated on-site or off-site areas (Figures 8A and 8B). These measures included the installation of silt fencing along the north property boundary, across drainage pathways of the Rail Spur Drainage, along the DD-3 Drainage, and along the off-site stormwater drainage designated as DD-4.

To prevent the flow of stormwater from entering the railroad spur excavation, berms were constructed at the head of the railroad spur drainage (south end of the spur) and at the northeast corner of the property to divert flow from a culvert originating on the United McGill property located to the east of the JCBGI site.

In addition, provisions were made to berm the edge of the asphalt roadway to prevent stormwater runoff from entering the excavation, and to collect and transfer rainwater and



EROSION AND SEDIMENT CONTROL MEASURES

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE: 1"=85'	
DATE: 9/16/94	
PROJECT MGR: WFF	
DRAWN BY: TMW	
JOB NUMBER: 94717	
REVISION DATE: 4-17-95	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

ERODE3.CVS

FIGURE 8A

Ⓐ RUNOFF ENTERING THE SITE FROM THE SOUTHERN EXTREME OF THE RAIL SPUR WAS MITIGATED BY CONSTRUCTING A BERM TO BLOCK INFLOWS TO THE SITE.

Ⓑ FLOW FROM ROOF DRAIN OUTFALLS LOCATED ALONG THE RETAINING WALL WAS MITIGATED BY EXCAVATING A SUMP AT THE OUTFALL, AND PUMPING STORMWATER TO UNDISTURBED AREAS.

Ⓒ SURFACE RUNOFF FROM THE ASPHALTED AREAS AT THE REAR OF THE PLANT WAS MITIGATED THROUGH THE CONSTRUCTION OF A TEMPORARY BERM, PARALLEL TO THE RAIL SPUR ON THE ASPHALT AS NECESSARY.

Ⓓ THE CULVERT DISCHARGE TO THE SITE ORIGINATING FROM THE UNITED MCGILL DEVELOPMENT CORPORATION WAS MITIGATED BY DIVERTING FLOWS AWAY FROM THE RAIL SPUR DRAINAGE SWALES USING BERMS. FLOW WAS CHANNELED NORTH TO THE WETLAND AREA. SILT FENCING WAS ALSO EMPLOYED TO LIMIT MIGRATION OF SEDIMENTS.

① APPROPRIATE EROSION MATTING / NETTING AND RE-VEGETATION WAS EMPLOYED AT ALL AREAS WHICH WERE DISTURBED DURING THE REMEDIAL ACTIVITIES.

② THE ROOF DRAIN OUTFALLS AND MCGILL DEVELOPMENT OUTFALL DISCHARGES WERE MODIFIED BY CONSTRUCTING AN ENERGY DISSIPATOR TO REDUCE EROSIONAL IMPACTS RESULTING FROM THESE FLOWS. THESE WERE CONSTRUCTED BY PLACING A BLANKET OF 3 TO 4 INCH COARSE GRADED STONE AT THE OUTFALL TO REDUCE THE FLOW VELOCITIES.

③ CHECK DAMS WERE PLACED AT APPROXIMATELY 200 FOOT INTERVALS ALONG THE FORMER RAIL SPUR BED TO LIMIT SOIL EROSION UNTIL APPROPRIATE VEGETATION IS ESTABLISHED.

④ TO LIMIT EROSION AND SEDIMENT TRANSPORT AT THE DITCH LOCATED AT THE FRONT PLANT ENTRANCE, COMMERCIAL BENTONITE MATTING WAS PLACED AFTER THE SURFACE WAS PREPARED. COARSE GRADED STONE WAS PLACED ON THE BENTONITE MAT AS AN ANCHOR AND TO REDUCE FLOW VELOCITIES.

NOTES CORRESPONDING WITH POST CONSTRUCTION SITE MAP (FIGURE 8A)

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

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GRAEF ANHALT SCHLOEMER and Associates Inc.

FIGURE 8B

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snowmelt being discharged to the ditch from roof drains. During a brief period of unseasonably warm weather and rain, a berm was constructed along the asphalt pavement edge with sandbags. Stormwater was collected from the roof drains in open-top drums and pumped to unexcavated areas.

4.0 PRE-EXCAVATION SAMPLING RESULTS

4.1 Isolated Areas

Three of the Isolated Areas, (650,350), RR-1,37 and (-255,0) (where concentrations above on-site thresholds were discovered in the October 1994 investigation), were sampled prior to excavating in order to more accurately define the horizontal extent. The lateral extent of lead contamination below on-site cleanup endpoints was established within a radius of five (5) feet at all three locations (Table 2). Sample point (-255,0) was not sampled at a radius of 5 feet to the north due to difficulties with access.

A grass area (-350,200) located at the northwest corner of the loading bay area was also sampled to obtain additional information. This area was located immediately north of MW-3. A single sample location was sampled at 0.5 foot intervals to a depth of 1.5 feet. None of the sample intervals had lead concentrations above cleanup endpoints (Table 2).

4.2 Propane Tank Area

In order to more accurately define the extent of impacts in the Propane Area, eight (8) additional soil samples were collected around P-(4,1), P-(2,1) and west of P-(4,3), P-(3,3) and P-(2,3) (see Figure 9A).

The area surrounding P-(4,1) was bounded on the north and west by paved areas. Additional samples were collected between P-(4,1) and P-(3,1) to the south and between P-(4,1) and P-(4,2) to the east (Figures 9A and 9B). None of these samples had concentrations higher than clean-up endpoints (Table 2).

Sample location P-(2,1) was bounded to the west by the paved loading bay area. Three additional samples were collected to the north, south and east of P-(2,1) where access near the aboveground piping was possible (Figures 9A and 9B). The samples collected to the north and south had concentrations below on-site cleanup thresholds, while the easternmost

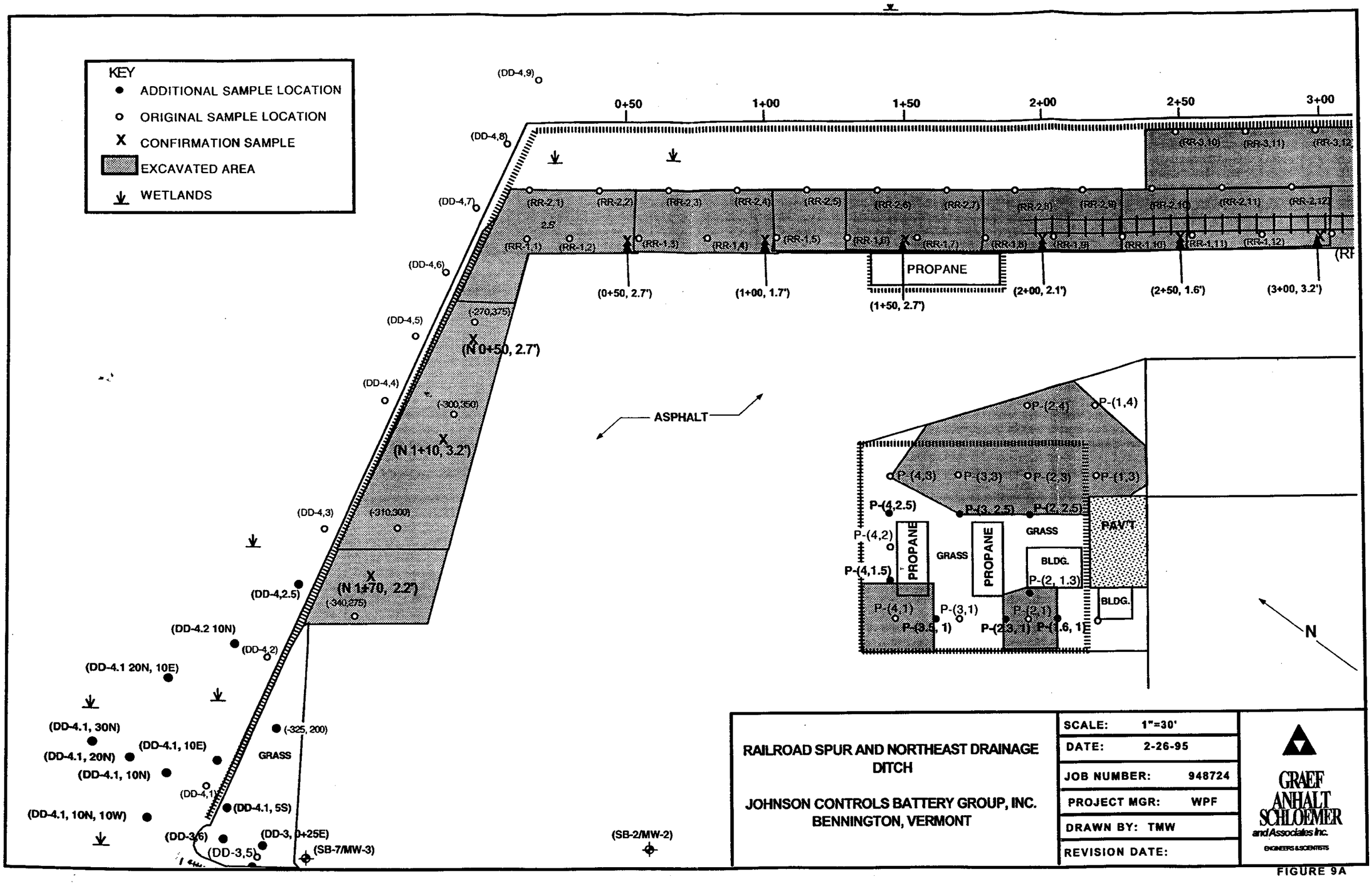
TABLE 2

PRE-EXCAVATION SOIL SAMPLING
ISOLATED AND PROPANE AREAS ANALYTICAL RESULTS

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VT

Sample #		Depth (feet)	Analysis	Date Shipped	Results (ppm)
650, 355	(5' EAST)	1.5-2.0	Total Pb	1/10/95	634
650, 360	(10' EAST)	1.5-2.0	Total Pb	1/10/95	442
655, 350	(5' SOUTH)	1.5-2.0	Total Pb	1/10/95	251
660, 350	(10' SOUTH)	1.5-2.0	Total Pb	1/10/95	42.9
650, 345	(5' WEST)	1.5-2.0	Total Pb	1/10/95	104
650, 340	(10' WEST)	1.5-2.0	Total Pb	1/10/95	180
645, 350	(10' NORTH)	1.5-2.0	Total Pb	1/10/95	789
RR-1, 37	5' EAST	0-0.5	Total Pb	1/10/95	48.6
RR-1, 37	10' EAST	0-0.5	Total Pb	1/10/95	67.9
RR-1, 37	5' WEST	0-0.5	Total Pb	1/10/95	198
RR-1, 37	10' WEST	0-0.5	Total Pb	1/10/95	69.8
RR-1, 37	5' NORTH	0-0.5	Total Pb	1/10/95	19.5
RR-1, 37	10' NORTH	0-0.5	Total Pb	1/10/95	185
RR-1, 37	5' SOUTH	0-0.5	Total Pb	1/10/95	60.8
RR-1, 37	10' SOUTH	0-0.5	Total Pb	1/10/95	34.8
-255, 05	(5' EAST)	0.5-1.0	Total Pb	1/10/95	89.8
-255,10	(10' EAST)	0.5-1.0	Total Pb	1/10/95	792
-255,-05	(5' WEST)	0.5-1.0	Total Pb	1/10/95	60.7
-255, -10	(10' WEST)	0.5-1.0	Total Pb	1/10/95	111
-265, 0	(10' NORTH)	0.5-1.0	Total Pb	1/10/95	15.7
(-325,200) 0.5'		0.5	Total Pb	1/17/95	28.7
(-325,200) 1.0'		1.0	Total Pb	1/17/95	32
(-325,200) 1.5'		1.5	Total Pb	1/17/95	63.2
P-(4,1.5) 2.0'		2.0	Total Pb	1/13/95	70.9
P-(3.5,1) 2.0,		2.0	Total Pb	1/13/95	12.4
P-(2,2.5) 0.5'		0.5	Total Pb	1/13/95	56.5
P-(3,2.5) 0.5'		0.5	Total Pb	1/13/95	10.2
P-(4,2.5) 0.5'		0.5	Total Pb	1/13/95	653
P-(2.3,1) 0.5'		0.5	Total Pb	1/13/95	773
P-(2,1.3) 0.5'		0.5	Total Pb	1/13/95	1720
P-(1.6,1) 0.5'		0.5	Total Pb	1/13/95	214

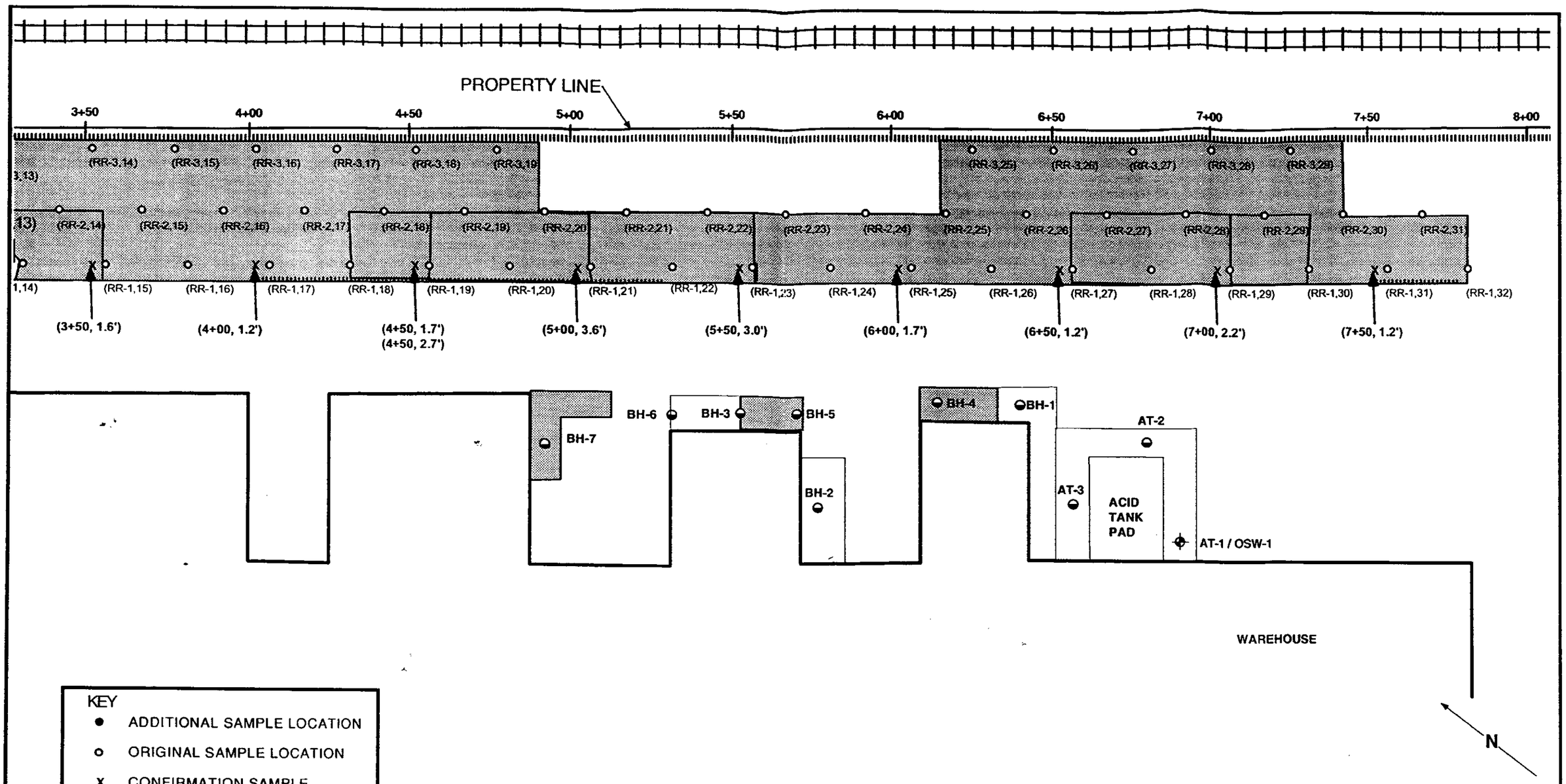
= Concentration Exceeding Negotiated On-Site Clean-up Endpoint



RAILROAD SPUR AND NORTHEAST DRAINAGE DITCH JOHNSON CONTROLS BATTERY GROUP, INC. BENNINGTON, VERMONT	SCALE: 1"=30' DATE: 2-26-95 JOB NUMBER: 948724 PROJECT MGR: WPF DRAWN BY: TMW REVISION DATE:

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

FIGURE 9A



KEY

- ● ADDITIONAL SAMPLE LOCATION
- o ORIGINAL SAMPLE LOCATION
- X CONFIRMATION SAMPLE
- ⊖ SOIL BORING
- ⊕ MONITORING WELL
- ▒ EXCAVATED AREA

RAILROAD SPUR DRAINAGE DITCH (SOUTHERN) AND BAGHOUSE AREA SAMPLING AND EXCAVATION LOCATION MAP

JOHNSON CONTROLS BATTERY GROUP, INC. BENNINGTON, VERMONT

SCALE:	1"=30'
DATE:	2-26-95
PROJECT MGR:	WPF
DRAWN BY:	TMW
JOB NUMBER:	948724
REVISION DATE:	4-17-95

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MAP1.CVS

FIGURE 9B

sample exceeded the 1,500 ppm threshold (1,720 ppm) (Table 2). No additional pre-excavation samples were collected to the east of this lead exceedance because an equipment outbuilding was located three feet to the east.

The eastern edge of the propane tank area, adjacent to sampling locations P-(4,3), P-(3,3) and P-(2,4), was bounded by a paved area to the east and the plant building to the south (Figures 9A and 9B). Additional samples were collected twelve (12) feet west of P-(4,3), P-(3,3), and P-(2,3). None of these samples had concentrations of lead above established cleanup endpoints (Table 2).

4.3 Northeast Stormwater Drainage Ditch (DD-4)

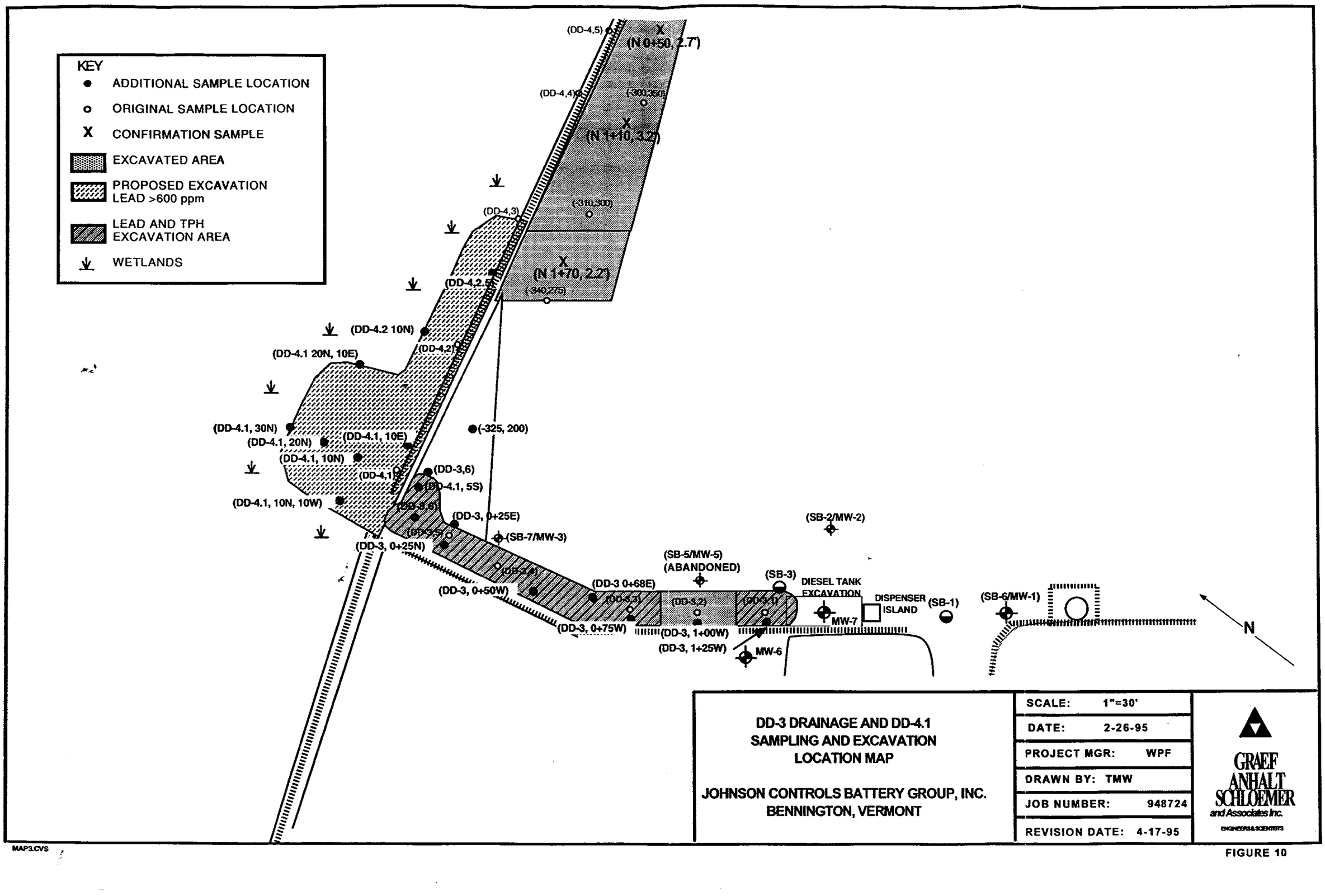
During the remedial investigation in October, 1994, a single sample point DD-4,1, located along the northeast stormwater drainage ditch DD-4, had a detection above the endpoints for off-site impacts (600 ppm). The DD-4,1 sampling point was located at the western end of the DD-4 sampling line (north of the project site). The VDEC requested that additional data be collected in order delineate the lateral extent. Additional sample points were selected in an outward radius from this location. When concentrations above 600 ppm were discovered, additional sample points were conducted at a larger radius. In addition, at the request of the VDEC, an additional sample was collected between points DD-4,2 and DD-4,3 which was designated DD-4,2.5.

The final extent of lead contaminated soil was defined by DD-4,1 5'S; DD-4,1 10'N 10"W; DD-4,1 30'N; and DD-4,2 10'N (Figure 10).

The initial sample collected from DD-4,2.5 had a total lead concentration of 47,300 ppm, subsequent resampling at this location revealed a lead concentration of 826 ppm. An additional sample point was conducted ten feet north (DD-4,2.5 10' N) which had a lead concentration of 33.1 ppm (Table 3). Based on these results the area from the fence between DD-4,3 and DD-4,2 to the location ten feet north was determined to require excavating as well (Figure 10).

4.4 Stormwater Drainage Ditch (DD-3)

In December, 1994, at the request of the VDEC, stormwater drainage ditch DD-3 was sampled at the following locations: DD-3,1; DD-3,3; and DD-3,5; in response to field



DD-3 DRAINAGE AND DD-4.1
SAMPLING AND EXCAVATION
LOCATION MAP

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VERMONT

SCALE:	1"=30'
DATE:	2-26-95
PROJECT MGR:	WPF
DRAWN BY:	TMW
JOB NUMBER:	948724
REVISION DATE:	4-17-95

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

MAP3.CVS

FIGURE 10

TABLE 3

NORTHEAST STORMWATER DRAINAGE DITCH (DD-4)
ANALYTICAL RESULTS

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VT

Sample #	Date Shipped	Lead (ppm)	TPH (High) (ppm)	TPH (Low) (ppm)
DD-4,1 10'N 1.0'	1/17/95	16800	1530	<5.0
DD-4,1 1.5-2.0'	1/17/95	36.4	NT	NT
DD-4,1 10'E 1.0'	1/17/95	3950	78	<5.0
DD-4,1 20'E 1.0'	1/17/95	1210	324	<5.0
DD-4,1 5'S 1.0'	1/17/95	31.8	NT	NT
DD-4,1 10' W 1.0'	1/17/95	24.9	NT	NT
DD-4,1 20'N 1.0'	1/20/95	535	54.8	<5.0
DD-4,1 30' N 1.0'	1/20/95	40.5	13.6	<5.0
DD-4, 2.5 0.5'	1/20/95	1420	NT	NT
DD-4, 2.5' 1.0'	1/20/95	47300	1760	<5.0
DD-4,1 20' E/20' N 1.0'	1/20/95	904	53.2	<5.0
DD-4,1 10'N/10'W 1.0'	1/20/95	442	81.6	<5.0
DD-4,2 10'N 1.0'	1/20/95	279	51.6	<5.0
DD-4, 2.5A 1.0'	1/25/95	826	<10	<5.0
DD-4, 2.5A 2.0'	1/25/95	826	NT	NT
DD-4, 2.5 10' N 1.0'	1/25/95	33.1	<10	<5.0
DD-4, 1 30' N 20'E 1.0'	1/25/95	20.1	<10	<5.0

= Concentration Exceeding Negotiated Off-Site Clean-up Endpoint

948724.23 DD-4,1.analyt

observations of petroleum odors and visible soil staining noted during lead investigations which took place in October, 1994. These samples were analyzed for Total Petroleum Hydrocarbons (TPH) and contained concentrations of TPH at 5,000 ppm, 3,142 ppm, and 5,000 ppm, respectively. Per the VDEC, the extent of TPH contamination along this drainage was investigated. Hand borings were conducted from 5-7 feet from the center line of the ditch at 25-foot intervals along each embankment (Figure 10). Samples were collected at various depths, depending on surface elevation, to target soil at the groundwater interface. Two of the sample locations, DD-3 1+25 W and DD-3 0+25 W, had detections of TPH above method detection limits, at concentrations of 72.4 ppm and 118 ppm respectively (Table 4).

5.0 SITE REMEDIAL ACTIVITIES

5.1 Excavation of Lead Contaminated Soils

5.1.1 Isolated Areas

The removal of contaminated soil in the isolated areas was accomplished by excavating with a Case 580 C tractor-loader-backhoe (TLB). The excavated material was transferred to the 2.5 cubic yard bucket of a Caterpillar 940 wheel-loader for transport to the stockpile. The material was transferred from the TLB to the wheel-loader bucket over an area covered with 6 mil poly to contain spillage. The isolated areas were excavated to the limits described earlier. Each isolated area was excavated to the depth where lead concentrations were below the established cleanup endpoint as previously determined by soil sampling.

5.1.2 Railroad Spur Excavation

5.1.2.1 Soil Removal and Disposal

Prior to excavating, the steel rails were unfastened, cut into manageable lengths, loaded into the roll-off and salvaged by a local scrap dealer. Excavation of the railroad spur drainage ditch was begun on the south end of the spur. A tracked excavator was utilized for removal of this material. The ties and ballast of the spur were removed along with lead contaminated soil. This material was loaded into 15 cubic yard dump trucks for hauling to the on-site staging area. The trucks remained on the paved area behind the plant building and were loaded on 6 mil poly to contain any spillage.

TABLE 4

STORMWATER DRAINAGE DITCH (DD-3)
ANALYTICAL RESULTS

JOHNSON CONTROLS BATTERY GROUP, INC.
BENNINGTON, VT

Sample #	Date Shipped	TPH (High) (ppm)	TPH (Low) (ppm)
(DD-3) 1+00 W	1/19/95	<10.0	<5.0
(DD-3) 1+25 W	1/19/95	72.4	<5.0
(DD-3) 0+75 W	1/19/95	<10.0	<5.0
(DD-3) 0+50 W	1/19/95	<10.0	<5.0
(DD-3) 0+25 W	1/19/95	118	<5.0
(DD-3) 0+25 E	1/19/95	<10.0	<5.0
(DD-3) 0+68 E	1/19/95	<10.0	<5.0
(DD-3) 1+25 W, 2.0' W	2/3/95	<10.0	<5.0
DD-3,3 3.1'	2/3/95	<10.0	<5.0
DD-3,1 3.2'	2/3/95	<10.0	<5.0
DD-3,6 2.9'	2/3/95	<10.0	<5.0
DD-3,7 2.5'	2/3/95	<10.0	<5.0
(DD-3) 0+25W 5'W	2/3/95	<10.0	<5.0
DD-3,6 8'N	2/3/95	<10.0	<5.0

= Concentration Exceeding Practical Quantification Limit

946724.23 DD-3.analyt.2/95

GAS personnel recorded original grade and depth of cut elevations at four cross-sectional points every 25 feet along the railroad spur. These cross-sections corresponded to the original sampling lines RR-1, RR-2, and RR-3 (Figures 9A and 9B). The elevation data is included in Appendix E.

Prior to and during excavating along the railroad spur drainage ditch, standing water accumulated from snowmelt and precipitation and, to a lesser degree, groundwater infiltration. The standing water was evacuated from the drainage ditch and containerized in mobile wastewater holding tanks. This was accomplished by constructing a sump in a low spot of the drainage ditch and channeling standing water to that location. The water was then pumped to the holding tanks via a centrifugal pump. During the course of excavation, and particularly backfilling, accumulated water was also pumped to the holding tanks.

5.1.2.2 Confirmation Sampling

In addition to recording grade elevations along the excavation, confirmation samples required by the VDEC were collected from the base of the excavation every 50 feet along former RR-1 sampling line. The excavation was not backfilled pending laboratory analysis of confirmation samples. Results of confirmation sampling are located in Table 5. Only one confirmation sample contained lead concentrations above on-site cleanup endpoints, sample 4+50 which was collected 1.7 feet in depth (Table 3). Soil from station 5+10 to 4+10 along the entire width of the excavation was excavated one foot deeper. Another confirmation sample was collected; this time the lead concentration was well below the established cleanup endpoint.

5.1.3 Propane Tank Area

Prior to excavating, the fencing was dismantled and underground utilities were located. The three separate sections previously delineated were excavated to their respective depths through the use of the TLB and hand excavating when in close proximity to the propane tanks, and around underground piping. The contaminated soil from this area was added to the stockpile slated for ultimate disposal.

TABLE 5

RAIL SPUR DRAINAGE DITCH CONFIRMATION SAMPLING ANALYTICAL RESULTS

JOHNSON CONTROLS BATTERY GROUP, INC. BENNINGTON, VT

Sample #	Analysis	Date Shipped	Results (ppm)
7+50, 1.2'	Total Pb	1/13/95	37.5
7+00, 2.2'	Total Pb	1/13/95	224
6+50, 1.2'	Total Pb	1/13/95	71.7
6+00, 1.7'	Total Pb	1/13/95	12
5+50, 3.0'	Total Pb	1/13/95	51.8
5+00, 3.6'	Total Pb	1/16/95	14.2
4+50, 1.7'	Total Pb	1/16/95	2450
4+00, 1.2'	Total Pb	1/17/95	16.2
3+50, 1.6'	Total Pb	1/17/95	7.2
3+00, 3.2'	Total Pb	1/17/95	1350
2+50, 1.6'	Total Pb	1/17/95	279
2+00, 2.1'	Total Pb	1/19/95	12.44
1+50, 2.7'	Total Pb	1/19/95	102
1+00, 1.7'	Total Pb	1/19/95	34.1
0+50 2.7'	Total Pb	1/20/95	111
4+50, 2.7'	Total Pb	1/23/95	510
N - 0+75, 3.8'	Total Pb	2/1/95	247
N - 1+10, 3.2'	Total Pb	2/1/95	7.0
N - 1+70, 2.2'	Total Pb	2/1/95	55.0

= Concentration Exceeding Negotiated On-Site Clean-up Endpoint

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5.2 Excavation of Petroleum Contaminated Soil (DD-3 Drainage)

Petroleum contaminated soil was excavated from drainage ditch DD-3 from the outfall of the culvert by the former UST location, north to the property fence. The excavation was approximately 10 to 12 feet wide between sampling points. The excavation extended to the north property fence and followed the ditch line east until all stained material was removed. Approximately 125 to 150 tons of material were added to the stockpile to be disposed of at City Environmental.

Confirmation samples were collected at locations that had previous detections (DD-3 1+25 W and DD-3 0+25 W), along the base of the excavation (DD-3,1 3.2', DD-3,3, 3.1', DD-3,6, 2.9'), and at the northeast base and sidewall of the excavation (DD-3,7 2.5 ft and DD-3,6 8'N). These sample locations are indicated on Figure 10. None of these samples had TPH concentrations above laboratory MDLs (Table 4).

5.3 Removal and Disposal of Excavation Water

Prior to and during excavation and backfilling of the railroad spur drainage ditch, water collecting in the drainageway and excavation was removed and containerized in mobile, 21,000-gallon storage tanks provided by the contractor. The primary sources of this water were stormwater runoff, rain, and associated groundwater recharge.

The initial 10,000 gallons of containerized water was disposed of off-site at Dupont Environmental Treatment Services. To facilitate disposal of remaining accumulated water, negotiations with the VDEC and the Bennington POTW resulted in permits to allow treatment and discharge through the on-site wastewater treatment facility (WWTF).

During transfer of the containerized water to the WWTF, the water was filtered through a 5 micron and 1 micron bag filter. The water was then processed through the WWTF per JCBGI's current operating permit. A total of 65,964 gallons of water from remedial activities were processed through the WWTF. An additional 4,950 gallons were disposed of at Dupont upon completion of the remedial project. This water resulted from decontamination of the storage tanks, equipment, and catchment sumps.

5.4 Disposal of Lead and Petroleum Contaminated Soil

Contaminated soil was transferred from the on-site stockpile to trucks for shipment to City Environmental, Inc., Detroit, Michigan. Several over-the-road hazardous waste transporting firms were subcontracted for this task (refer to subcontractor table for companies). Licensed hazardous waste tri-axle dump trailers were employed for transport.

The procedure for loading and manifesting was as follows:

1. Trucks would arrive throughout the night to stage for loading.
2. Drivers would install gaskets on dump box gates and line dump boxes with a poly-liner while waiting to load.
3. A 20-feet by 50-feet section of poly was laid down at the entrance of the exclusion zone.
4. Dump trailers were backed into the entrance of the exclusion zone over the poly with only the dump trailer entering the exclusion zone.
5. The trailer was loaded by the wheel loader and the poly was swept off prior to trailer departure.
6. The transport truck was moved to a secondary exclusion zone where the driver would cover the load with a canvas or poly tarp.

A weigh ticket for the empty truck and trailer was obtained from a certified scale. The driver signed the manifest; one copy was left on site and the remaining copies accompanied the truck and trailer to City Environmental. Transport trucks were weighed at Dailey, Inc. (Shaftsbury, Vermont, approximately five miles away) and loaded weight tickets were returned to EWT.

The material was then transported to City Environmental for stabilization and landfilling. Copies of manifests were submitted to the State of Vermont by JCBGI.

5.5 Capping of Off-Site Drainage Swale (DD-2)

The DD-2 drainage ditch line is located in an off-site area north of the main entrance to the property (Figure 2). The area is wooded and slopes steeply to the west-northwest. The actual channel of the drainage ditch is poorly defined and indirect. It is approximately two to three feet wide by 150 to 175 feet in length, with an average depth of less than 0.5 feet.

There is no standing water in this drainageway. As an additional requirement of the site corrective action plan, the VDEC requested that the drainageway be capped with material having low permeability and then covered with riprap to avoid wash out. This was required to avoid erosion and subsequent transport of lead contaminated soil within the ditch.

5.5.1 Materials

An impermeable barrier was applied to the DD-2 drainage pathway through the use of a commercially available geotextile liner. Voltex™ geotextile waterproofing liner manufactured by American Colloid Company was provided by the contractor and approved for use by GAS. Voltex™ is a liner constructed of a layer of sodium bentonite sandwiched between two layers of polypropylene geotextile fabric. It was supplied in four-foot wide by eight-foot long sheets (see Appendix D for material specifications).

5.5.2 Construction Methods

The area to be covered was prepared by grubbing or cutting vegetation under the footprint of the mat. The ditch was then re-graded to accommodate the liner and cover materials. Low permeability backfill material ("pond fill") was used to define the drainageway and fill in low spots. This material was compacted with the bucket of the excavator. The Voltex™ liner was installed starting 0.5 to 1.0 feet under the invert of the drainage culvert. The sheets were rolled out with the upstream sheet overlapping the downstream sheet, until 75 feet of drainage was covered. Approximately three to six inches of washed, 3/4-inch gravel was placed on top of the liner five to 6 feet in width to anchor and protect the geotextile fabric. Approximately six to eight inches of tailings (four to eight-inch diameter stone from aggregate screening) was installed over the top of the 3/4-inch gravel.

6.0 EXCEPTIONS TO THE CORRECTIVE ACTION PLAN

6.1 General

During the course of conducting the remedial investigation, a small, localized area of lead (Pb) contamination was identified within an off-site drainage ditch located in the northeastern portion of the site (DD-4). Lead concentrations above the cleanup endpoint were detected at soil sample point DD-4,1 only. Initially, remediation of contaminated soil and sediment was proposed only in this localized interval within the ditch. However, at the request of VDEC,

further analytical testing was conducted on soil and sediments within the drainage ditch and adjacent wetland to attempt to better define the extent of lead and petroleum impacts.

During the period of January 17 through 25, 1995, approximately sixteen (16) surficial soil and sediment samples were obtained from the wetland area for analysis of total lead. Figure 10 illustrates the approximate sampling locations, and Table 3 summarizes the analytical testing results.

In general, total lead concentrations ranged from 20.1 ppm to 47,300 ppm. A review of the data and sample locations reveals that the significant portion of lead impacted sediment appears to be central to the wetland area and concentrations appear to taper off radially from the center of the area. If an access agreement is reached, JCBGI will remediate the Greenburg property. However, if access is not granted, no further actions will be conducted within the wetland.

6.2 Wetland Attenuation of Metals—Previous Studies

In order to evaluate the potential environmental impacts related to leaving the contaminated sediments in place, research was conducted to assess wetland affects on the mobility and attenuation of heavy metals within the perennially flooded sediments. In general, three mechanisms of heavy metal attenuation by wetlands were investigated as outlined below:

- Surface runoff losses of heavy metals from wetland system sediments.
- Leaching losses of heavy metals from wetland sediments to surface water.
- Wetland plant uptake of heavy metals from impacted sediments.

These three attenuation mechanisms appear to be the primary processes affecting the mobility and transport of heavy metals within and out of wetland ecosystems.

The degree of mobility of heavy metals within flooded wetland environments is primarily a function of the sediment pH. Specifically, as oxidized wetland soils and sediments are flooded and become anaerobic or reducing, the sediment pH tends to converge towards 7.0 (neutrality) regardless of the initial sediment pH conditions. These near-neutral pH conditions for wetland sediments tend to inhibit the solubilization of the heavy metals and thus minimizes the transport of these species.

6.2.1 Surface Runoff Losses

The surface runoff loss of heavy metals from the wetland ecosystem is generally minimal due to the neutral pH conditions and subsequent low mobility of the metals. Typically, flooded fine-textured soils containing significant organic matter (reduced) are effective in immobilizing surface runoff losses of metals. In a study conducted by Turner, et. al (1985), 98 percent of incoming lead (Pb) was retained by vegetation and muck soil such that very little lead (Pb) was exported from the wetland via stream flow.

6.2.2 Leaching Losses

The typical hydrology of wetlands is such that water permeability is very slow, and in conjunction with the anaerobic sediment conditions and a neutral pH, metals leaching from sediments to the aqueous phase would be minor. This is primarily the result of strong reducing conditions within the flooded sediments which favors metals immobilization. A previous study by Palermo, et. al. (1989) revealed some movement of lead (Pb) in anaerobic sediments, but at much lower levels than found in contaminated upland soils.

6.2.3 Plant Uptake Losses

Plant uptake of heavy metals is also strongly a function of the redox environment of the soils / sediments. Wetland sediments under reduced conditions (flooded and anaerobic), show significantly reduced plant uptake when compared to oxidizing conditions (upland soils). In a study conducted by Gambrell, et. al. (1980), significantly reduced uptake of exhangeable lead was noted in reduced sediments when compared to oxidized sediment conditions. Generally, metal uptake is significantly greater in marsh plant species in upland conditions when compared to wetland conditions.

6.3 Assessment of Environmental Impact

Based upon the discussion presented above, lead impacted sediments within the wetland at the site will not likely adversely affect groundwater, surface water, or the plant species. Observations made at the site reveal that the wetland is likely flooded throughout the year. As such, reducing conditions likely govern within the wetland sediments. As a consequence, nearly neutral pH conditions would prevail within the sediments, and the lead (Pb) would be present in immobile forms. Furthermore, the sediments within the wetlands contain significant

amounts of organic matter, which would also inhibit the mobility of the lead compounds through adsorptive processes.

In summary, adverse impacts to the wetland, surface water, or groundwater quality at the JCBGI site related to the remaining lead (Pb) impacted sediments are not anticipated. Attenuation mechanisms typically associated with hydric wetland soils present would likely inhibit lead mobility and transport in surface water and groundwater.

The potential for direct human exposure to lead within the wetland is possible but expected to be minimal. The wetland is bordered to the south, east, and west by fences and is surrounded by private land. Access to the general public is already limited.

7.0 SITE RESTORATION

7.1 Restoration of Excavated Areas

Upon completion of the excavation activities, disturbed areas were backfilled, regraded and revegetated. Imported fill material was provided from a local quarry operator. The material consisted of a fine grained soil type exhibiting low permeability characteristics (*i.e.*, greater than 90 percent passing a #200 sieve). This material was the byproduct of the sorting and washing of mined aggregate raw materials (Appendix D).

Backfilled areas were graded so that topographic transitions were smooth and gradual. Grading was performed to reflect the original surface topography which was present prior to site disturbance. In the rail spur area, the site was regraded to improve positive drainage away from the site. Grading was developed so that drainage along the former rail spur retained its original path from south to north, ultimately discharging to the wetland area (see elevational data in Appendix E).

Where necessary to support vegetation, adequate topsoil was provided. Revegetation of all disturbed areas was performed to limit erosion and as an interim control to limit direct contact exposures to human receptors. Revegetation was accomplished using a commercially available seed impregnated erosion mat, Cell-O-Seed®, manufactured by North American Green (Appendix D). The erosion matting was installed with staple fasteners to prevent displacement prior to germination.

7.2 Post-Construction Erosion and Sediment Control

In addition to revegetating with a Cell-O-Seed® mat, riprap diversion dams were placed at 200-foot intervals along the railroad spur drainage to divert and slow down flow.

Silt fencing was left in place along the north property line to prevent off-site migration of sediment. The berm diverting flow from the off-site culvert (stormwater discharge from the United McGill Co.) was left in place to direct flow of stormwater to off-site areas. The locations of post-construction erosion and sediment control are located on Figure 6.

8.0 CONCLUSIONS

The remediation of lead contaminated soil was performed according to the procedures established in the VDEC-approved site Corrective Action Plan. The on-site cleanup target level of 1,500 ppm lead was successfully achieved as indicated by the results of confirmation soil sampling in the two main areas (railroad spur and north grassy area). In general, the average concentration of lead in confirmation soil samples was 125 ppm, indicating that the actual cleanup levels were considerably lower than the target goals. Approximately 4,225 tons of lead contaminated soil were removed from the site for stabilization and landfilling.

In addition, TPH contamination was remediated in ditch line DD-3 leading from an old diesel tank excavation to off-site ditch line DD-4. The petroleum contaminated soil was stabilized and landfilled at City Environmental along with lead contaminated soil. Petroleum contaminated sediment totaled approximately 125 to 150 tons.

As requested by the VDEC, off-site erosion control measures were implemented along ditch line DD-2. The measures included lining the ditch with a low permeability clay liner and covering the liner with cobble-sized stone. The original grade and positive off-site drainage were maintained.

JCBGI is attemtping to gain access to remove lead and petroleum contaminated soil from the wetland area located off-site to the north of the facility (ditch line DD-4). Mr. Jerald Greenburg, owner of the wetland property, was contacted well ahead of remedial activities for the purpose of gaining access to the wetlands. At this time, an access agreement has not been obtained to conduct remedial activities on his property, and no contaminated soil has

been removed from this area. An initial study was performed to determine the mobility of contaminants within the wetland and the potential risk of human exposure. Results of the study indicate that petroleum contaminants will slowly degrade to methane, hydrogen sulfide, carbon dioxide, and water over time, and will not have an appreciable degree of mobility. The lead contamination will not degrade; however, it will not be mobile and appreciable plant uptake will not occur. If an access agreement cannot be obtained, no remediation of the wetland area is recommended, as the general public has only limited access to the wetland.

9.0 RECOMMENDATIONS

All areas on-site and off-site (except for the Greenburg property) identified as having lead concentrations greater than 1,500 ppm and 600 ppm, respectively, have been successfully remediated. Remedial efforts achieved a higher degree of success than expected with an average residual lead concentrations of 125 ppm.

On-site petroleum contamination was effectively removed from the stormwater drainage ditch from the old tank excavation to off-site drainage ditch DD-4. After three monitoring events, only trace concentrations of petroleum-related VOC (below federal action levels) have been detected in groundwater.

Therefore, JCBGI recommends the following:

1. No further remedial actions be required for lead impacts in on-site and off-site soil, with the possible exception of off-site wetland impacts along ditch line DD-4 north of the facility (Jerald Greenburg property).

2. Actions should continue to successfully obtain access to remediate lead impacts on the Jerald Greenburg property. If access is not granted, then no remediation is recommended, as no significant risk to human health is evident.

3. As agreed upon with the VDEC, re-sample on-site well OSW-1 and off-site wells OSW-2 and OSW-3 once more for total lead. If lead impacts in groundwater are not identified, close the site to future actions involving investigation or remediation of lead contamination.

4. No further remedial actions be required for petroleum related compounds or VOCs in on-site or off-site soil.

5. Re-sample monitoring wells MW-1 through MW-7 (except for MW-5, which was abandoned) once more for VOCs. If VOC impacts requiring remediation are not detected, close the site to future actions involving investigation or remediation of petroleum or VOC contamination.

10.0 REFERENCES

Doll, Charles G., 1961, Centennial Geologic Map of Vermont: Vermont Geological Society, scale 1:250,000.

Doll, Charles G., 1970, Generalized Geologic Map of Vermont: Vermont Geological Society, scale 1 inch = 16 miles.

Doll, Charles G., 1970, Surficial Geologic Map of Vermont: Vermont Geological Society, scale 1: 250,000.

Freeze, R.A. and Cherry, S.A., 1979, Groundwater: Prentice Hall, Englewood Cliffs, New Jersey, 604 pp.

Gambrell, R. P. Journal of Environmental Quality, "Trace and Toxic Metals in Wetlands—A Review," Volume 23, No. 5, September-October, 1994.

Gambrell, R.P., R.A. Khalid, and W.H. Patrick, Jr. 1980. Chemical Availability of Mercury, Lead, and Zinc in Mobile Bay Sediments Suspension as Affected by pH and Oxidation-Reduction Conditions, Environmental Science Technology, 14:431-436.

Palermo, M.R., R.A. Schafer, J.M. Braunon, T.E. Myers, C.L. Truitt, M.E. Zappi, et. al. Evaluation of Dredged Material Disposal Alternatives for U.S. Navy Homeport at Everett, Washington, Tech. Rep. EL-89-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Soil Conservation Service, 1974, 1986, Bennington County, Vermont: Soil Survey Field Sheets 3-141 and 3-143, 1974, and Field Mapping Legend, 1986.

State of Vermont, Agency of Natural Resources, 1991, Underground Storage Tank Regulations: Vermont Department of Environmental Conservation, Waterbury, Vermont, 61 pp.

State of Vermont, 1991, Vermont State Statutes, Title 10, Chapter 59: State of Vermont, 19 pp.

State of Vermont, 1994, Site Investigation Guidance: Vermont Department of Environmental Conservation, Waterbury, Vermont, 16 pp.

State of Vermont, 1992, Agency Guidelines for Handling Petroleum Contaminated Soils and Carbon Media: Vermont Department of Environmental Conservation, Waterbury, Vermont, 9 pp.

Turner, R.S., A.H. Johnson, and D. Wang. 1985, Biogeochemistry of Lead in McDonald's Branch Watershed, New Jersey Pine Barrens, Journal of Environmental Quality. 14:305-314.

USGS, 1954, Bennington, Vermont: USGS 7.5 Minute Quadrangle, scale 1:24,000.

USGS, 1974, Hydrologic Unit Map, States of New Hampshire and Vermont: USGS, scale 1:500,000.

APPENDICES

APPENDIX A

LOAD SUMMARY — EWT

		1/19/95							
Johnson Controls									
Bennington Vt.									
EPA ID # VT D001780725							Project # 948530		
Lead Soil Approval Code 13312H							Job # 7024		
Load #	LOADS #	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	*Tare Weight	Tons	tax***
# 1	# 1	MI4102255	DART	T197KC	32,600	87,780	55,180	27.59	9
# 2	# 2	MI4102256	DART	XA71741	32,980	78,220	45,240	22.62	9
# 3	# 3	MI4102257	DART	T677XJ	33,500	85,760	52,260	26.13	13
# 4	# 4	MI4102258	DART	T85KB	32,400	89,080	56,680	28.34	13
# 5	# 5	MI4102259	DART	T809KB	34,600	89,920	55,320	27.66	13
# 6	# 6	MI4102260	DART	TV46062	33,780	80,720	46,940	23.47	13
# 7	# 7	MI4102243	BFC	TK20495	33,740	86,840	53,100	26.55	14
# 8	# 8	MI4102244	BFC	45084T	34,280	81,480	47,200	23.6	14
# 9	# 9	MI4102245	BFC	TY99933	35,540	87,520	51,980	25.99	14
# 10	# 10	MI4102246	BFC	XAO8344	34,360	81,640	47,280	23.64	14
# 11	# 11	MI4102261	DART	T205KC	31,360	79,240	47,880	23.94	14
# 12	# 12	MI4102262	DART	T201KC	32,180	78,660	46,480	23.24	14
# 13	# 13	MI4102263	DART	TAF4848	33,560	83,840	50,280	25.14	14
# 14	# 14	MI4102264	DART	T784KB	35,200	89,700	54,500	27.25	14
# 15	# 15	MI4102265	DART	T557JE	32,700	82,120	49,420	24.71	14
							Total Tons	**379.87**	**196.00**
							Total / Date	**379.87**	
							Avg / truck	**25.32**	

LOAD SUMMARY

EWT

		1/20/95							
Johnson Controls									
Bennington Vt.									
EPA ID # VT D001780725							Project # 948530		
Lead Soil Approval Code 13312H							Job # 7024		
Load	# / Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 16	MI-4102266	DART	T558JE	31,200	79,900	48,700	24.35	14
# 2	# 17	MI4102267	DART	T561JE	33,120	86,660	53,540	26.77	14
# 3	# 18	MI4102247	BFC	45081T	34,720	82,480	47,760	23.88	14
# 4	# 19	MI4102274	BFC	99427F	35,020	83,200	48,180	24.09	14
# 5	# 20	MI4102268	DART	L64591	33,500	88,240	54,740	27.37	14
# 6	# 21	MI4102269	DART	XA44664	32,500	82,980	50,480	25.24	14
# 7	# 22	MI4102270	DART	T200KD	30,860	80,600	49,740	24.87	14
# 8	# 23	MI4102271	DART	T801KB	34,660	85,000	50,340	25.17	14
# 9	# 24	MI4102275	BFC	35864U	34,460	81,160	46,700	23.35	14
# 10	# 25	MI4102276	BFC	45094T	35,100	84,820	49,720	24.86	14
# 11	# 26	MI4102248	FRANK'S	80360V	34,300	79,120	44,820	22.41	14
# 12	# 27	MI4102249	FRANK'S	80369V	34,660	78,680	44,020	22.01	14
# 13	# 28	MI4102250	FRANK'S	43473E	34,600	77,700	43,100	21.55	14
# 14	# 29	MI4102272	DART	640-TSS	29,760	84,160	54,400	27.20	14
# 15	# 30	MI4102251	FRANKS	80360V	34,300	79,120	44,820	22.41	14
							Total Tons	365.53	210.00
							Total / Date	745.4	
							Avg / truck	24.37	

LOAD SUMMARY

EWT

1/23/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725

Project # 948530

Job # 7024

Lead Soil Approval Code 13312H

Load	# / Loads	Man #	Trans#	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 31	MI4102273	DART	L64591	31,880	88,000	56,120	28.06	14
# 2	# 32	MI4102285	DART	T201KC	32,340	80,260	47,920	23.96	14
# 3	# 33	MI4102286	DART	D45621	35,840	81,680	45,840	22.92	12
# 4	# 34	MI4102287	DART	T561JE	31,420	78,620	47,200	23.60	12
# 5	# 35	MI4102288	DART	T558JE	31,420	82,400	50,980	25.49	12
# 6	# 36	MI4102289	DART	T809KB	32,480	90,360	57,880	28.94	12
# 7	# 37	MI4102290	DART	T85KB	32,100	92,180	60,080	30.04	14
# 8	# 38	MI4102291	DART	T550JE	32,400	94,000	61,600	30.80	14
# 9	# 39	MI4102277	BFC	80777V	38,000	81,000	43,000	21.50	9
# 10	# 40	MI4102292	DART	XA71741	32,980	81,980	49,000	24.50	12
# 11	# 41	MI4102293	DART	XA44659	30,100	80,860	50,760	25.38	12
# 12	# 42	MI4102294	DART	T707KE	36,880	97,080	60,200	30.10	14
# 13	# 43	MI4102295	DART	T805KB	35,480	92,900	57,420	28.71	14
# 14	# 44	MI4102105	PAGE	R45807	32,580	93,200	60,620	30.31	14
# 15	# 45	MI4102106	PAGE	M79882	31,740	86,100	54,360	27.18	14
# 16	# 46	MI4102296	DART	L50702	34,500	79,580	45,080	22.54	12
# 17	# 47	MI4102297	DART	39144	37,420	88,960	51,540	25.77	12
# 18	# 48	MI4102298	DART	18206R	34,100	85,880	51,780	25.89	12
# 19	# 49	MI4102278	BFC	86402D	35,980	83,100	47,120	23.56	9
# 20	# 50	MI4102108	BFC	553260	36,240	79,340	43,100	21.55	9
# 21	# 51	MI4102109	BFC	43632T	35,620	87,920	52,300	26.15	12
# 22	# 52	MI4102110	PAGE	XA81723	33,580	89,400	55,820	27.91	14
# 23	# 53	MI4102107	PAGE	277546	31,360	85,720	54,360	27.18	12
							Total Tons	**602.04**	**285.00**
							Total / Date	**1347.44**	
							Avg / truck	**26.18**	

LOAD SUMMARY — EWT

1/24/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725

Project # 948530

Lead Soil Approval Code 13312H

Job # 7024

Load	# / Loads	Man #	Trans	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 54	MI4102299	DART	T207KC	32,180	81,260	49,080	24.54	12
# 2	# 55	MI4102120	BFC	TY9933	35,340	83,280	47,940	23.97	9
# 3	# 56	MI4102300	DART	TV46062	33,780	79,040	45,260	22.63	9
# 4	# 57	MI4102101	DART	T557JE	32,700	79,540	46,840	23.42	9
# 5	# 58	MI4102102	DART	T190BH	32,520	79,520	47,000	23.50	12
# 6	# 59	MI4102103	DART	T677XJ	33,500	83,060	49,560	24.78	9
# 7	# 60	MI4102104	DART	L63364	33,600	80,420	46,820	23.41	12
# 8	# 61	MI4102121	BFC	98987F	31,480	72,600	41,120	20.56	9
# 9	# 62	MI4102122	BFC	TK20495	33,500	80,020	46,520	23.26	12
# 10	# 63	MI4102123	PAGE	776674	34,200	84,760	50,560	25.28	12
# 11	# 64	MI4102111	DART	T197KC	32,400	88,760	56,360	28.18	12
# 12	# 65	MI4102112	DART	XB13468	34,740	96,920	62,180	31.09	12
# 13	# 66	MI4102124	BFC	98289F	30,850	78,040	47,190	23.60	12
							Total Tons	**318.22**	**141.00**
							Total / Date	**1665.66**	
							Avg / truck	**24.48**	

LOAD SUMMARY — EWT

		1/25/95							
Johnson Controls									
Bennington Vt.									
EPA ID # VT D001780725							Project # 948530		
Lead Soil Approval Code 13312H							Job # 7024		
Load	# / Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 67	MI4102135	BFC	358640	31,460	80,840	49,380	24.69	14
# 2	# 68	MI4102136	BFC	45094T	32,450	78,100	45,650	22.83	14
# 3	# 69	MI4102114	DART	T801KB	35,000	81,000	46,000	23.00	14
# 4	# 70	MI4102115	DART	T200KB	31,400	80,900	49,500	24.75	14
# 5	# 71	MI4102116	DART	T736KC	32,200	80,880	48,680	24.34	14
# 6	# 72	MI4102117	DART	T740KC	32,480	79,620	47,140	23.57	14
# 7	# 73	MI4102118	DART	T287KD	32,300	79,680	47,380	23.69	14
# 8	# 74	MI4102138	BFC	45082T	35,160	80,520	45,360	22.68	14
# 9	# 75	MI4102119	DART	640TSS	29,760	78,180	48,420	24.21	14
# 10	# 76	MI4102137	DART	T550JE	32,700	94,120	61,420	30.71	14
# 11	# 77	MI4102139	DART	T809KB	33,400	84,320	50,920	25.46	14
# 12	# 78	MI4102140	DART	T85KB	32,300	90,240	57,940	28.97	14
# 13	# 79	MI4102141	PAGE	TWO7421	31,840	83,000	51,160	25.58	14
# 14	# 80	MI4102142	PAGE	TN98883	32,720	80,260	47,540	23.77	14
# 15	# 81	MI4102113	DART	T561JE	29,320	85,760	56,440	28.22	14
# 16	# 82	MI4102144	BFC	80748V	34,840	81,620	46,780	23.39	14
# 17	# 83	MI4102145	HORWITH	TW56996	33,540	82,200	48,660	24.33	14
# 18	# 84	MI4102146	HORWITH	TY55778	35,540	78,020	42,480	21.24	14
# 19	# 85	MI4102147	DART	18206R	33,460	79,400	45,940	22.97	14
# 20	# 86	MI4102149	HORWITH	TY30444	34,220	77,860	43,640	21.82	14
# 21	# 87	MI4102148	DART	39144	33,460	89,860	56,400	28.20	14
# 22	# 88	MI4102160	HORWITH	XA07721	32,940	79,300	46,360	23.18	14
# 23	# 89	MI4102162	HORWITH	XB14427	31,960	86,540	54,580	27.29	14
# 24	# 90	MI4102163	HORWITH	TZ47345	33,380	79,580	46,200	23.10	14
# 25	# 91	MI4102164	HORWITH	TY14553	33,320	85,000	51,680	25.84	14
# 26	# 92	MI4102165	BFC	98292F	32,340	83,420	51,080	25.54	14
# 27	# 93	MI4102167	HORWITH	TT78952	33,860	82,280	48,420	24.21	14
# 28	# 94	MI4102168	HORWITH	XB54594	32,960	81,720	48,760	24.38	14
# 29	# 95	MI4102169	PAGE	XA81724	33,260	85,860	52,600	26.30	14
# 30	# 96	MI4102143	PAGE	XA81729	34,380	83,740	49,360	24.68	14
							Total Tons	742.94	420.00
							Total / Date	2408.59	

LOAD SUMMARY — EWT

1/25/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725 — Project # 948530

Lead Soil Approval Code 13312H — Job # 7024

Load #	# Loads	Manif #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 67	MI4102135	BFC	358640	31,460	80,840	49,380	24.69	14
# 2	# 68	MI4102136	BFC	45094T	32,450	78,100	45,650	22.83	14
# 3	# 69	MI4102114	DART	T801KB	35,000	81,000	46,000	23.00	14
# 4	# 70	MI4102115	DART	T200KB	31,400	80,900	49,500	24.75	14
# 5	# 71	MI4102116	DART	T736KC	32,200	80,880	48,680	24.34	14
# 6	# 72	MI4102117	DART	T740KC	32,480	79,620	47,140	23.57	14
# 7	# 73	MI4102118	DART	T287KD	32,300	79,680	47,380	23.69	14
# 8	# 74	MI4102138	BFC	45082T	35,160	80,520	45,360	22.68	14
# 9	# 75	MI4102119	DART	640TSS	29,760	78,180	48,420	24.21	14
# 10	# 76	MI4102137	DART	T550JE	32,700	94,120	61,420	30.71	14
# 11	# 77	MI4102139	DART	T809KB	33,400	84,320	50,920	25.46	14
# 12	# 78	MI4102140	DART	T85KB	32,300	90,240	57,940	28.97	14
# 13	# 79	MI4102141	PAGE	TWO7421	31,840	83,000	51,160	25.58	14
# 14	# 80	MI4102142	PAGE	TN98883	32,720	80,260	47,540	23.77	14
# 15	# 81	MI4102113	DART	T561JE	29,320	85,760	56,440	28.22	14
# 16	# 82	MI4102144	BFC	80748V	34,840	81,620	46,780	23.39	14
# 17	# 83	MI4102145	HORWITH	TW56996	33,540	82,200	48,660	24.33	14
# 18	# 84	MI4102146	HORWITH	TY55778	35,540	78,020	42,480	21.24	14
# 19	# 85	MI4102147	DART	18206R	33,460	79,400	45,940	22.97	14
# 20	# 86	MI4102149	HORWITH	TY30444	34,220	77,860	43,640	21.82	14
# 21	# 87	MI4102148	DART	39144	33,460	89,860	56,400	28.20	14
# 22	# 88	MI4102160	HORWITH	XA07721	32,940	79,300	46,360	23.18	14
# 23	# 89	MI4102162	HORWITH	XB14427	31,960	86,540	54,580	27.29	14
# 24	# 90	MI4102163	HORWITH	TZ47345	33,380	79,580	46,200	23.10	14
# 25	# 91	MI4102164	HORWITH	TY14553	33,320	85,000	51,680	25.84	14
# 26	# 92	MI4102165	BFC	98292F	32,340	83,420	51,080	25.54	14
# 27	# 93	MI4102167	HORWITH	TT78952	33,860	82,280	48,420	24.21	14
# 28	# 94	MI4102168	HORWITH	XB54594	32,960	81,720	48,760	24.38	14
# 29	# 95	MI4102169	PAGE	XA81724	33,260	85,860	52,600	26.30	14
# 30	# 96	MI4102143	PAGE	XA81729	34,380	83,740	49,360	24.68	14
							Total Tons	742.94	420.00
							Total / Date	2408.59	
							Avg / truck	24.76	

LOAD SUMMARY — EWT

1/26/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725 — Project # 948530

Lead Soil Approval Code 13312H — Job # 7024

Load	# / Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	Yds
# 1	# 97	MI4102170	DART	XA44659	30,640	77,880	47,240	23.62	14
# 2	# 98	MI4102171	DART	L64591	31,880	82,060	50,180	25.09	14
# 3	# 99	MI4102172	DART	XA71741	32,740	79,580	46,840	23.42	14
# 4	# 100	MI4102173	DART	D45621	33,500	82,600	49,100	24.55	14
# 5	# 101	MI4102174	BFC	55329D	35,800	76,100	40,300	20.15	14
# 6	# 102	MI4102175	DART	T558JE	31,280	78,920	47,640	23.82	14
# 7	# 103	MI4102176	PAGE	T115KF	29,560	76,000	46,440	23.22	14
# 8	# 104	MI4102177	BFC	XAO8344	34,240	81,100	46,860	23.43	14
# 9	# 105	MI4102178	BFC	98834	32,680	82,160	49,480	24.74	14
# 10	# 106	MI4102179	DART	TV46062	33,780	77,980	44,200	22.10	14
# 11	# 107	MI4102180	DART	T557JE	32,820	78,700	45,880	22.94	14
# 12	# 108	MI4102181	DART	T207KC	31,240	78,440	47,200	23.60	14
# 13	# 109	MI4102182	DART	T190BH	32,840	81,560	48,720	24.36	14
# 14	# 110	MI4102183	PAGE	200437	32,180	71,080	38,900	19.45	14
# 15	# 111	MI4102184	HORWITH	TN74987	32,680	80,800	48,120	24.06	14
# 16	# 112	MI4102185	HORWITH	XA73509	34,220	77,040	42,820	21.41	14
# 17	# 113	MI4102186	HORWITH	XA66041	34,240	70,480	36,240	18.12	14
# 18	# 114	MI4102187	HORWITH	XA61007	30,500	78,920	48,420	24.21	14
# 19	# 115	MI4102188	HORWITH	TM99723	30,520	79,120	48,600	24.30	14
# 20	# 116	MI4102189	HORWITH	TY30468	32,220	78,440	46,220	23.11	14
# 21	# 117	MI4102190	HORWITH	T215908	33,240	83,140	49,900	24.95	14
# 22	# 118	MI4102191	HORWITH	TY21801	32,380	85,460	53,080	26.54	14
# 23	# 119	MI4102192	BFC	99427F	35,200	80,800	45,600	22.80	14
# 24	# 120	MI4102193	HORWITH	TK29248	31,980	80,340	48,360	24.18	14
# 25	# 121	MI4102194	HORWITH	TY30802	35,080	82,080	47,000	23.50	14
# 26	# 122	MI4102195	DART	XA44664	32,500	85,260	52,760	26.38	14
# 27	# 123	MI4102196	HORWITH	XA07719	33,140	85,260	52,120	26.06	14
							Total Tons	**634.11**	**378.00**
							Total / Date	**3042.70**	
							Avg / truck	**23.49**	

LOAD SUMMARY — EWT

1/27/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725 — Project # 948530

Lead Soil Approval Code 13312H — Job # 7024

Load	# Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 28	# 124	MI4102198	HORWITH	XB14428	33,760	92,080	58,320	29.16	14
# 29	# 125	MI4102197	HORWITH	TZ15906	33,720	74,000	40,280	20.14	14
							Total Tons	**49.30**	**28.00**
							Total / Date	**3092.00**	
							Avg / truck	**24.65**	

LOAD SUMMARY — EWT

2/2/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725 — Project # 948530

Lead Soil Approval Code 13312H — Job # 7024

Load	# Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 126	MI4102199	PAGE	XA81728	34,240	82,080	46,580	23.29	14
# 2	# 127	MI4102200	PAGE	M77674	33,880	83,620	49,740	24.87	14
# 3	# 128	MI3972002	PAGE	XA81724	33,360	80,820	47,460	23.73	14
# 4	# 129	MI3972004	PAGE	M79882	31,720	93,180	61,460	30.73	14
# 5	# 130	MI3972005	PAGE	R45807	31,800	97,460	65,660	32.83	14
							Total Tons	**135.45**	**70.00**
							Total / Date	**3227.45**	
							Avg / truck	**27.09**	

LOAD SUMMARY — EWT

		2/7/95							
Johnson Controls									
Bennington Vt.									
EPA ID # VT D001780725							Project # 948530		
Lead Soil Approval Code 13312H							Job # 7024		
Load	# / Loads	Man #	Trans	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 130	MI3972003	DART	T197KC	32,300	88,140	55,840	27.92	14
# 2	# 131	MI3972006	DART	T85KB	32,220	90,540	58,320	29.16	14
# 3	# 132	MI3458278	DART	T790KB	32,500	86,120	53,620	26.81	14
# 4	# 133	MI3458279	DART	L64591	31,880	93,080	61,200	30.60	14
# 5	# 134	MI3458280	DART	640TSS	29,760	81,100	51,340	25.67	14
# 6	# 135	MI3573870	DART	XA44659	30,640	77,680	47,040	23.52	14
# 7	# 136	MI3019244	DART	TV46062	33,780	76,460	42,680	21.34	14
# 8	# 137	MI3019245	DART	T0207KC	31,200	80,040	48,840	24.42	14
# 9	# 138	MI3019246	DART	T103KB	31,600	81,080	49,480	24.74	14
# 10	# 139	MI3019247	DART	T558JE	30,820	81,500	50,680	25.34	14
# 11	# 140	MI3019248	PAGE	T115KE	29,620	77,540	47,920	23.96	14
# 12	# 141	MI3729879	HORWITH	XB14427	31,960	82,240	50,280	25.14	14
# 13	# 142	MI3019249	HORWITH	XA07721	32,940	84,400	51,460	25.73	14
# 14	# 143	MI3019051	PAGE	XA81724	35,080	84,840	49,760	24.88	14
# 15	# 144	MI3019052	PAGE	M77674	34,400	87,300	52,900	26.45	14
# 16	# 145	MI3458282	PAGE	XA81728	35,700	82,000	46,300	23.15	14
# 17	# 146	MI3458283	PAGE	27754G	32,600	88,340	55,740	27.87	14
# 18	# 147	MI3972051	PAGE	47317	32,900	86,720	53,820	26.91	14
# 19	# 148	MI3972052	FRANK'S	43473E	34,260	72,900	38,640	19.32	14
# 20	# 149	MI3972053	FRANK'S	80369V	35,100	78,060	42,960	21.48	14
# 21	# 150	MI3972067	FRANK'S	80360V	34,620	76,180	41,560	20.78	14
# 22	# 151	MI3188991	FRANK'S	80362V	33,860	78,800	44,940	22.47	14
# 23	# 152	MI3188992	DART	T200KD	31,120	78,380	47,260	23.63	14
# 24	# 153	MI3188993	PAGE	TS93045	32,300	79,160	46,860	23.43	14
# 25	# 154	MI3188994	PAGE	V50500	35,700	81,460	45,760	22.88	14
# 26	# 155	MI3188995	DART	XA44664	32,140	79,960	47,820	23.91	14
# 27	# 156	MI3188997	HORWITH	TY21801	30,960	81,780	50,820	25.41	14
# 28	# 157	MI3188999	HORWITH	TM99723	31,180	81,220	50,040	25.02	14
							Total Tons	691.94	392.00
							Total / Date	3919.39	
							Avg / truck	24.71	

LOAD SUMMARY — EWT

2/8/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725

Project # 948530

Job # 7024

Lead Soil Approval Code 13312H

Load	# Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
# 1	# 158	MI3189000	PAGE	R45807	32,960	96,220	63,260	31.63	14
# 2	# 159	MI3188961	PAGE	M79882	31,720	86,540	54,820	27.41	14
# 3	# 160	MI3972095	PAGE	70470	32,420	78,080	45,660	22.83	14
# 4	# 161	MI3972096	PAGE	23073G	33,060	80,040	46,980	23.49	14
# 5	# 162	MI3972097	PAGE	TW26730	32,960	81,500	48,540	24.27	14
# 6	# 163	MI3972098	PAGE	TW07421	34,240	83,620	49,380	24.69	14
# 7	# 164	MI3972099	PAGE	U55669	33,260	84,800	51,540	25.77	14
# 8	# 165	MI3972100	PAGE	TP42373	33,520	86,320	52,800	26.40	14
# 9	# 166	MI3972101	PAGE	XA81729	33,780	87,420	53,640	26.82	14
# 10	# 167	MI3972102	PAGE	V50501	33,580	84,660	51,080	25.54	14
# 11	# 168	MI3972103	PAGE	241697ST	30,340	80,920	50,580	25.29	14
							Total Tons	**284.14**	**154.00**
							Total / Date	**4203.53**	
							Avg / truck	**25.83**	

LOAD SUMMARY — EWT

2/10/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725

Project # 948530

Lead Soil Approval Code 13312H

Job # 7024

Load	# / Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
#1	# 169	MI3972104	PAGE	R45807	32,400	106,840	74,440	37.22	14
#2	# 170	MI3972105	PAGE	M79882	31,260	109,020	77,760	38.88	14
#3	# 171	MI3972106	PAGE	U50501	33,040	79,820	46,780	23.39	14
							Total Tons	**99.49**	**42.00**
							Total / Date	**4303.02**	
							Avg / truck	**33.16**	

LOAD SUMMARY — EWT

2/13/95

Johnson Controls

Bennington Vt.

EPA ID # VT D001780725

Project # 948530

Lead Soil Approval Code 13312H

Job # 7024

Load	# / Loads	Man #	Trans.	Trailer Plate	Light Weight	Gross Weight	Tare Weight	Tons	yds
#1	# 172	MI3972108	PAGE	TW26730	32,720	92060	59,340	29.67	14
#2	# 173	MI3972107	PAGE	TN98883	31,620	91080	59,460	29.73	14
							Total Tons	**59.40**	**28.00**
							Total / Date	**4362.42**	
							Avg / truck	**29.70**	

APPENDIX B

SITE SAFETY PLAN

JOHNSON CONTROLS, INC.
Route 67A North Bennington Road
Bennington, Vermont 05201

JANUARY, 1995

GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC.
345 North 95th Street
Milwaukee, Wisconsin 53226

Project Number 948724

Table of Contents

Table of Contents

ENVIRONMENTAL DIVISION
I. SITE SAFETY INFORMATION SHEET

A. LOCAL EMERGENCY NUMBERS:

1. Police: 9-1-1
2. Fire Department: 9-1-1
3. Utilities: Gas: Propane Gas
   Electric: Central Vermont Public Service 442-1026
   Water: Bennington Town Office (day) 442-1037; (eve) police 9-1-1
4. Nearest phone: Field Office
5. Nearest Hospital: Southwestern Vermont Medical Center, 100 Hospital Drive, Bennington, Vermont; 442-6314

Directions to Hospital:

From Johnson Controls exit, turn left on Highway 67A. Proceed southeast on Highway 67A to Belmont Drive. Turn right onto Belmont Drive and proceed south to Main Street (Highway 9). Turn left on Main Street (Highway 9), then an immediate right turn onto Dewey Street. Proceed three blocks south on Dewey Street to Hospital Drive East. Turn right on Hospital Drive East. Emergency Entrance is on north side of Hospital Drive East.

B. Prioritized List of People to Contact in Case of Emergency:

(1) Project Manager Wayne Fassbender Phone: (414) 256-4060
(2) Eric Chudzik Phone: on-site (802) 442-8126/(414) 852-7980
(3) Jerry Chudzik Phone: (414) 256-4060
(4) Bassem Haddad Phone: (414) 256-4060

C. Have the Site Safety Plan in hand and expect to answer these questions in the event of an emergency:

Your Name?
Phone number where you can be contacted: 442 8126
Your exact location and where to enter the site:

What happened (nature of emergency)?

accident *personal injury*
fire *explosion*
gas leak *other*

If personal injury occurred, give:

Name(s)? Location(s)? Condition(s) - age and vital signs, if receiving medical attention -- by whom, etc? Are there chemical or physical hazards that impair rescue operations (see 2nd page - "Anticipated Dangers & Potential Hazards")
Is anyone missing?

D. Anticipated Dangers and Potential Hazards (Appendix A):

During Lead Remediation:	**During UST Investigations:**
Lead Dust	VOCs
Lead Dioxide	

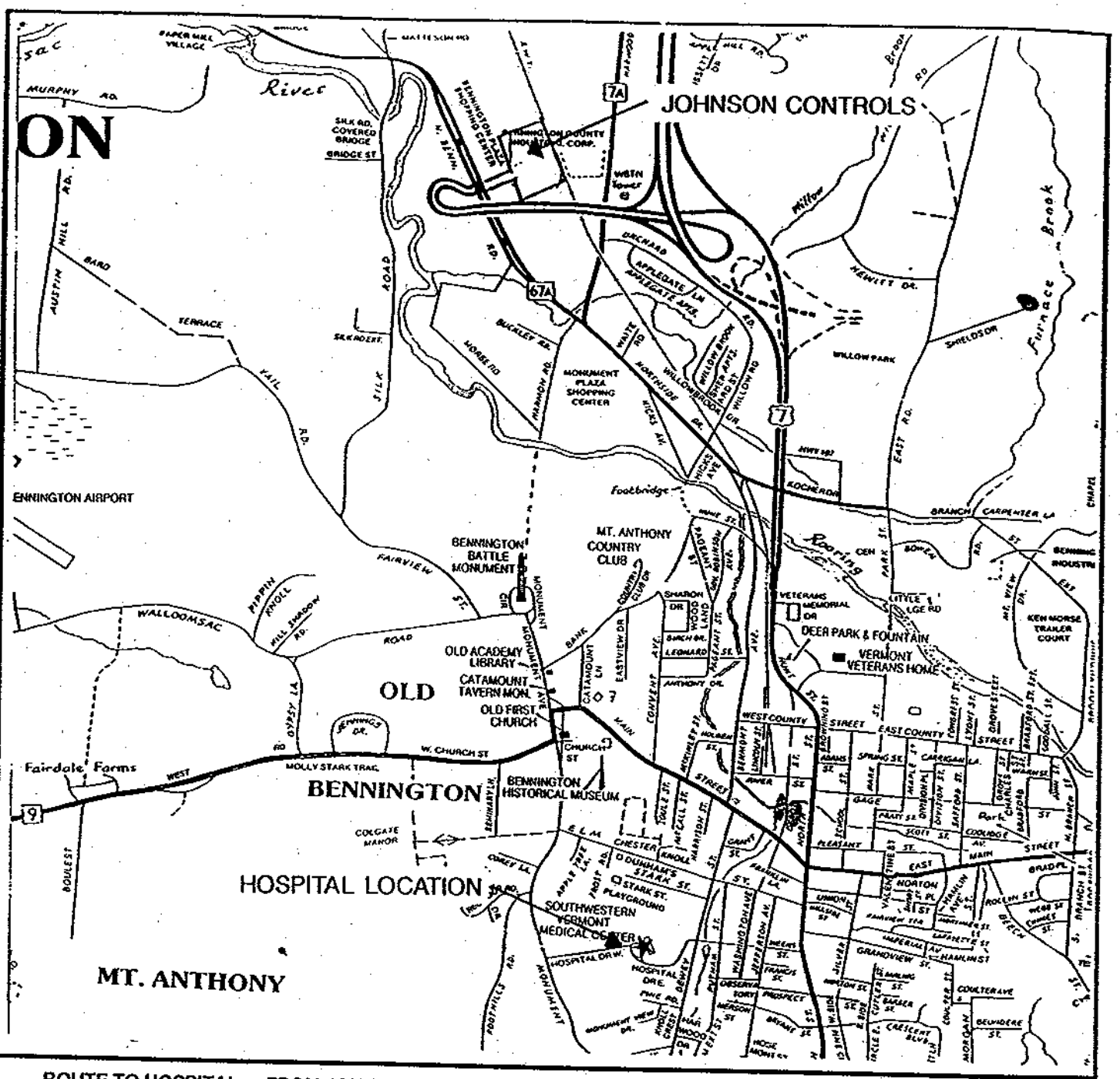
E. In Case of Media Involvement:

Do not release any information. GAS cannot release information about the job without clearing it with Johnson Controls, Inc. project manager, Mr. James Meverden first. Field personnel should recommend that the media contact Mr. James Meverden and Swanson Environmental for detailed information.

F. ***I have read and understand this Site Safety Plan and its contents:***

Print Name	*Signature*	*Date*
ERIC M. CHUDZIK		1-9-95
JAMES H. KASDORF JR	James H. Kasdorf JR	1-10-95
R. Bruce Bowers		1/11/95

Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date
Print Name	Signature	Date



ROUTE TO HOSPITAL: FROM JOHNSON CONTROLS EXIT, TURN LEFT ONTO HIGHWAY 67A. PROCEED SOUTHEAST ON HIGHWAY 67A TO BELMONT DRIVE. TURN RIGHT ONTO BELMONT DRIVE AND PROCEED SOUTH TO MAIN STREET (HIGHWAY 9). TURN LEFT ON MAIN STREET (HIGHWAY 9), THEN AN IMMEDIATE RIGHT TURN ONTO DEWEY STREET. PROCEED THREE BLOCKS SOUTH ON DEWEY STREET TO HOSPITAL DRIVE EAST. TURN RIGHT ONTO HOSPITAL DRIVE EAST. THE EMERGENCY ENTRANCE IS ON THE NORTH SIDE OF HOSPTAL DRIVE EAST.

N

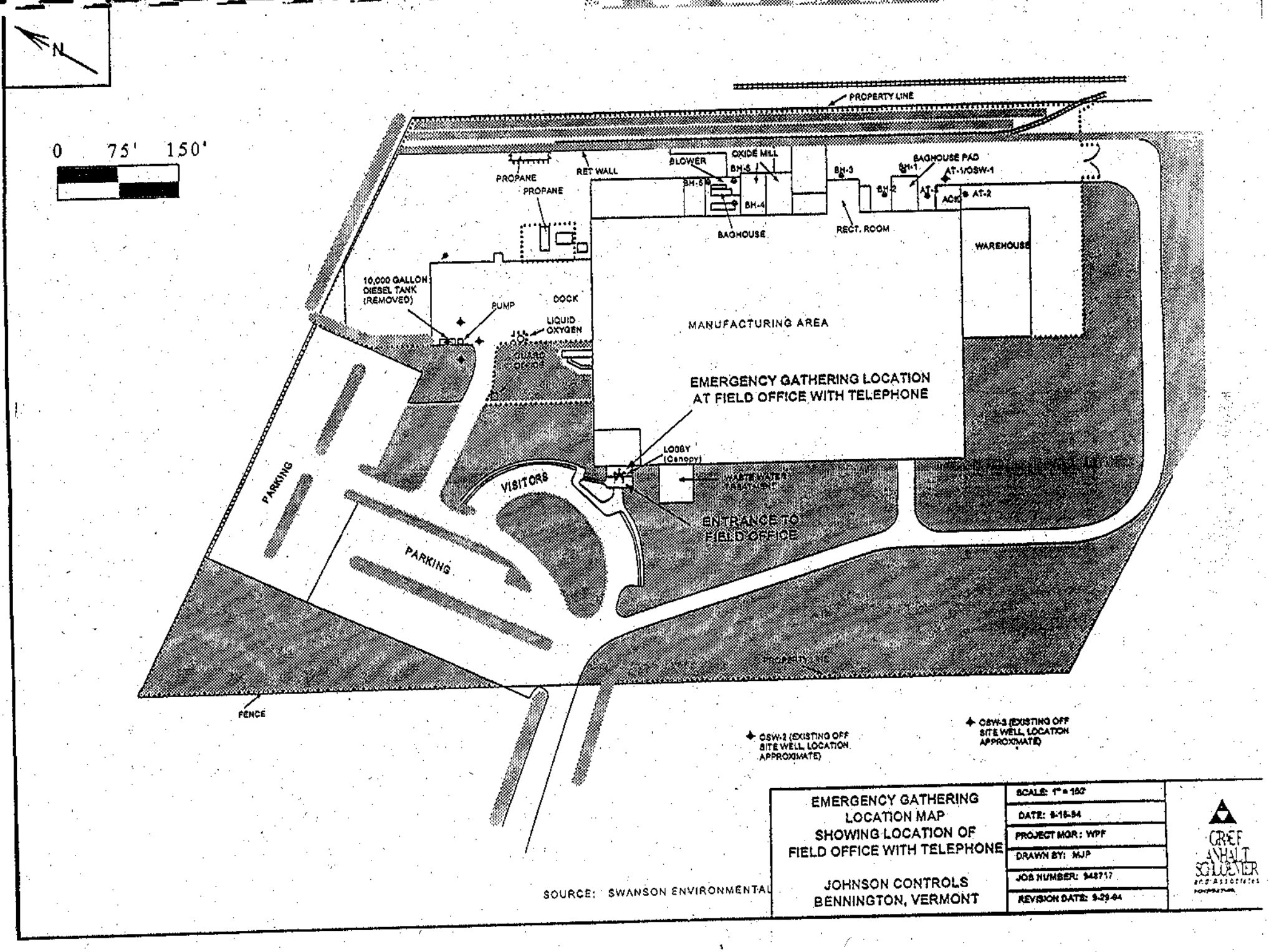
ROUTE TO HOSPITAL

JOHNSON CONTROLS
BENNINGTON, VERMONT

SCALE:	
DATE:	1/7/95
PROJECT MGR:	WPF
DRAWN BY:	MJP
JOB NUMBER:	948724
REVISION DATE:	

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

948724.D1 HOSP RTE



SOURCE: SWANSON ENVIRONMENTAL

EMERGENCY GATHERING LOCATION MAP
SHOWING LOCATION OF FIELD OFFICE WITH TELEPHONE

JOHNSON CONTROLS
BENNINGTON, VERMONT

SCALE: 1" = 150'	
DATE: 9-16-94	
PROJECT MGR.: WPF	
DRAWN BY: MJP	
JOB NUMBER: 948717	
REVISION DATE: 9-29-94	

GREF ANHALT SCHLOSSER and Associates

II. SITE SAFETY PLAN FOR GAS INVOLVEMENT IN PROJECT

A. PROJECT NAME: Site Investigation

B. LOCATION: Route 67A North Bennington Road
Bennington, Vermont 05201

C. INTRODUCTION AND BACKGROUND INFORMATION

Graef, Anhalt, Schloemer & Associates Inc. (GAS) was contracted by Johnson Controls, Inc. (Owner) through Swanson Environmental, Inc. (Project Manager) to oversee and document remedial activities performed at the above referenced site.

The project site is currently leased by Johnson Controls Battery Group, Inc. The site is developed with one major structure, built in 1965 for use by the Johnson Controls Battery Group, Inc. to manufacture lead acid automotive batteries until its closing in 1994. According to Mr. Paul Bohnay, engineer with the City of Bennington Building Department, the current project site and all adjacent land were originally agricultural land.

In October, 1994, an investigation was conducted to determine the extent of lead contamination at the site. Bid documents were prepared and a contract for remediation was awarded.

The project involves excavating lead contaminated soils above 1,500 ppm on-site and 600 ppm off-site. The soil shall be hauled by an approved hazardous waste transporter to a U.S. EPA permitted RCRA treatment, storage, and disposal facility (TSDF). At the TSDF, the lead contaminated soils shall be processed through solidification / stabilization (S/S).

Confirmation testing will be conducted by GAS at several discrete locations to validate removal of the contaminated soils to the approved cleanup endpoints. The excavated portions of the site shall be backfilled with approved backfill material and provided with an erosion-resistant material.

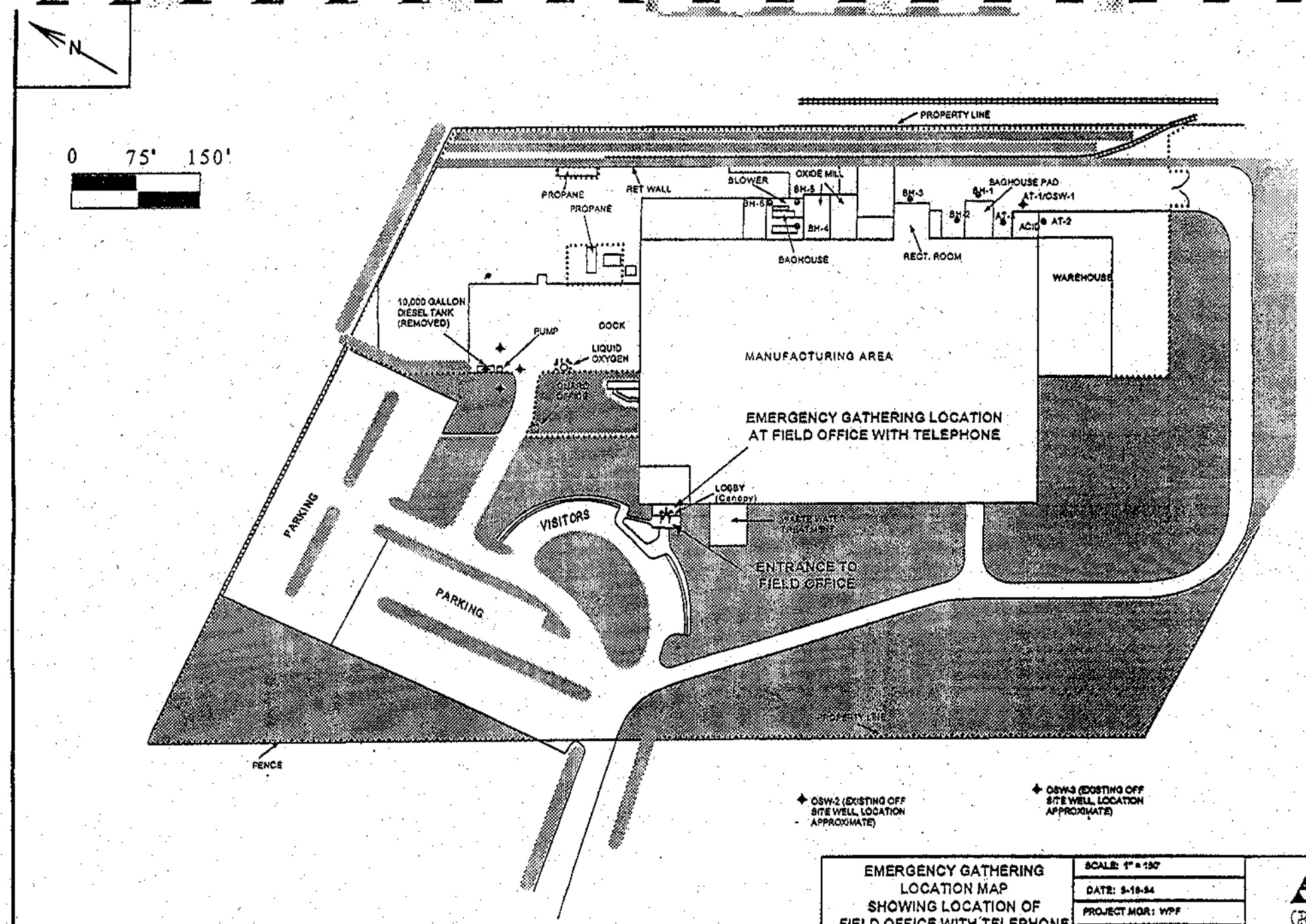
A possible additional phase of this investigation will delineate and possibly remediate by excavation diesel fuel contamination associated with a 10,000-gallon diesel underground storage tank (UST).

The health and safety protocols established in this plan are based on the interpretation of conditions and chemical hazards known and/or anticipated to be present from available site data furnished by Johnson Controls, Inc., Swanson Environmental, Inc., and from an investigation performed by GAS.

The following documents written by GAS were referenced while preparing this Site Safety Plan (SSP):

1. *Site Investigation and Remedial Feasibility Study Concerning Lead Contamination in Soil,* October, 1994

2. *Site Investigation Report for a 10,000-Gallon Underground Diesel Fuel Storage Tank System,*



SOURCE: SWANSON ENVIRONMENTAL

EMERGENCY GATHERING LOCATION MAP SHOWING LOCATION OF FIELD OFFICE WITH TELEPHONE JOHNSON CONTROLS BENNINGTON, VERMONT	SCALE: 1" = 150' DATE: 9-16-94 PROJECT MGR: WPF DRAWN BY: MJP JOB NUMBER: 942717 REVISION DATE: 9-29-94

CREEF AHEARN SCHLOSSER AND ASSOCIATES INC.

II. SITE SAFETY PLAN FOR GAS INVOLVEMENT IN PROJECT

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1. *Site Investigation and Remedial Feasibility Study Concerning Lead Contamination in Soil,* October, 1994

2. *Site Investigation Report for a 10,000-Gallon Underground Diesel Fuel Storage Tank System,*

3. *Corrective Action Plan*, November, 1994

4. *Request for Bid for Remediation of Lead Contaminated Soils*, December, 1994

Appendix A contains health-related chemical data for hazardous substances which may be present on-site.

The following Site Safety Plan (SSP) is intended for use by GAS and its employees during the proposed activities. Specifications herein are subject to review and revision based on actual conditions encountered in the field during site characterization activities. Any subcontractors for the project must prepare their own Site Safety Plan, or they may adopt this plan as their own.

Prior to the initiation of site activities, GAS employees involved shall read and understand this SSP and revisions made to it. A signature page (2) is provided to assure that each GAS employee involved understands this SSP.

D. KEY PERSONNEL

1. **GAS Project Manager:** Wayne P. Fassbender

2. **GAS Site Manager:** Eric M. Chudzik

3. **GAS Resident Project Representative:** Jim Kasdorf

The following individual(s) located on site will have the authority and responsibility to act on behalf of the GAS Project Manager to revise levels of protection for GAS employees and when deemed necessary recommend to Owner the cessation of activities on the site:

- Eric M. Chudzik (Site Manager)

E. PERSONNEL ROLES

1. GAS Project Manager (PM)

The GAS Project Manager is assigned the responsibility for fulfillment of the terms of the contract with the Owner. He/she must oversee GAS activities and observe that legal and safety requirements affecting GAS's activities are met. It is his/her duty to keep GAS's work on schedule, within budget, and to communicate with the client regarding progress toward the specified goals. All GAS project personnel are responsible for reporting any and all potential or actual safety violations to the GAS Project Manager.

It will be the Project Manager's responsibility to report any emergency and any actions taken in response to that emergency to the GAS Environmental Division Manager, the client, and/or owner of the site.

2. Site Manager / Site Safety Officer (SM/SSO)

Functions as on-site coordinator and oversees all operations for the GAS Project Manager. Will conduct a preliminary site safety meeting with contractors prior to the start of work and any other time he/she determines a site safety meeting is needed. Reports in a regular and comprehensive manner to the GAS Project

Manager. Implements the site perimeter and maintains site security. Observes contractor and all on-site activities performed by resident project representatives and contractors (laborers, technicians, and equipment operators). Ensures all on-site GAS personnel follow all GAS health and safety procedures, especially those concerning personal protective equipment, decontamination, and mechanical operations.

The GAS Site Manager / Site Safety Officer will determine if the GAS Emergency Response Plan should be initiated. It will be the Site Manager's responsibility to make sure an Incident/Injury/Illness Log form or a Resident Project Representative's Report of Contractor's Accident is filled out in the event of an emergency (Appendix B).

If the Site Manager notices a potential or probable unsafe act by a contractor, he will verbally inform the contractor's foreman or superintendent of the unsafe act; this notification will be recorded. In addition, if a potential or probable unsafe act continues or if site conditions change via weather or any other source, the Site Manager / Site Safety Officer, at his/her discretion, will conduct a daily site safety meeting prior to the start of work to address his/her concerns. If the unsafe act is not corrected within a reasonable amount of time, the GAS Site Manager/supervisor will notify the contractor's foreman or superintendent of the unsafe act in writing. A copy of the written notification will be sent to the contractor's home office and GAS's project manager.

3. GAS Resident Project Representative (RPR)

The GAS Resident Project Representative's responsibilities include the data and sample collection. They direct the subcontractor on the collection of samples and construction of groundwater monitoring wells. Observes all on-site activities performed by contractor (including laborers, technicians, and equipment operators). Ensures all on-site GAS personnel follow all GAS health and safety procedures, especially those concerning personal protective equipment, decontamination, and mechanical operations. The GAS Resident Project Representative reports to the GAS Site Manager.

F. STANDARD OPERATING PROCEDURES

1. Personnel Precautions

- The project manager(s) and all GAS personnel who visit the site shall read and sign the SSP.
- GAS personnel must be familiar with standard operating safety procedures and any additional instructions and information contained in this Site Safety Plan.
- GAS personnel must adhere to the information contained in this Site Safety Plan
- GAS personnel will be aware of the symptoms caused by exposure to hazardous chemicals on site and for heat or cold stress.
- EATING, DRINKING, CHEWING GUM OR TOBACCO, SMOKING, OR ANY PRACTICE THAT INCREASES THE PROBABILITY OF

HAND-TO-MOUTH TRANSFER AND INGESTION OF MATERIAL IS PROHIBITED ON SITE EXCEPT IN DESIGNATED AREAS: FIELD OFFICE, JCBGI ADMINISTRATIVE OFFICES.

- **All GAS personnel must follow PPE and decontamination procedures outlined in this plan.**
- Hard hat, safety glasses, and safety shoes shall be required during operation of any heavy machinery.
- GAS personnel will pull off-site to re-evaluate the situation if there are any indications of on-site hazardous chemicals or waste not specifically identified in this SSP.
- GAS personnel shall not enter confined spaces where an oxygen-deficient or toxic atmosphere may exist without obtaining the prior approval of the Site Safety Officer.

2. Site Activities

- Unauthorized GAS Personnel are not permitted on the project site.
- All visitors are required to sign in with the SM/SSO per OSHA 29 CFR 1910 and provide their own PPE as outlined in plan.
- **No smoking, open flames, or sparks will be permitted within the designated work area.**
- Regular inspections of site activities will be conducted by the SM/SSO to monitor compliance with the SSP. If any changes in site operations are necessary, the SM/SSO will evaluate the need for changes to the SSP.
- Review Table 1 -- Safety and Health Risk Analysis vs. Site Task/Operation.

3. **Established Work Zone**

A. Exclusion Zone (Hot Zone)

- Estabilised within the active work zone (illustrated on Figure 3)
- Defined by a chain-link fence along the north and east perimeter of the property and by the plant building.
- The gate on the north side of the facility will be the only entrance / exit for authorized personnel and equipment.

TABLE 1 Safety and Health Risk Analysis vs. Site Task/Operation

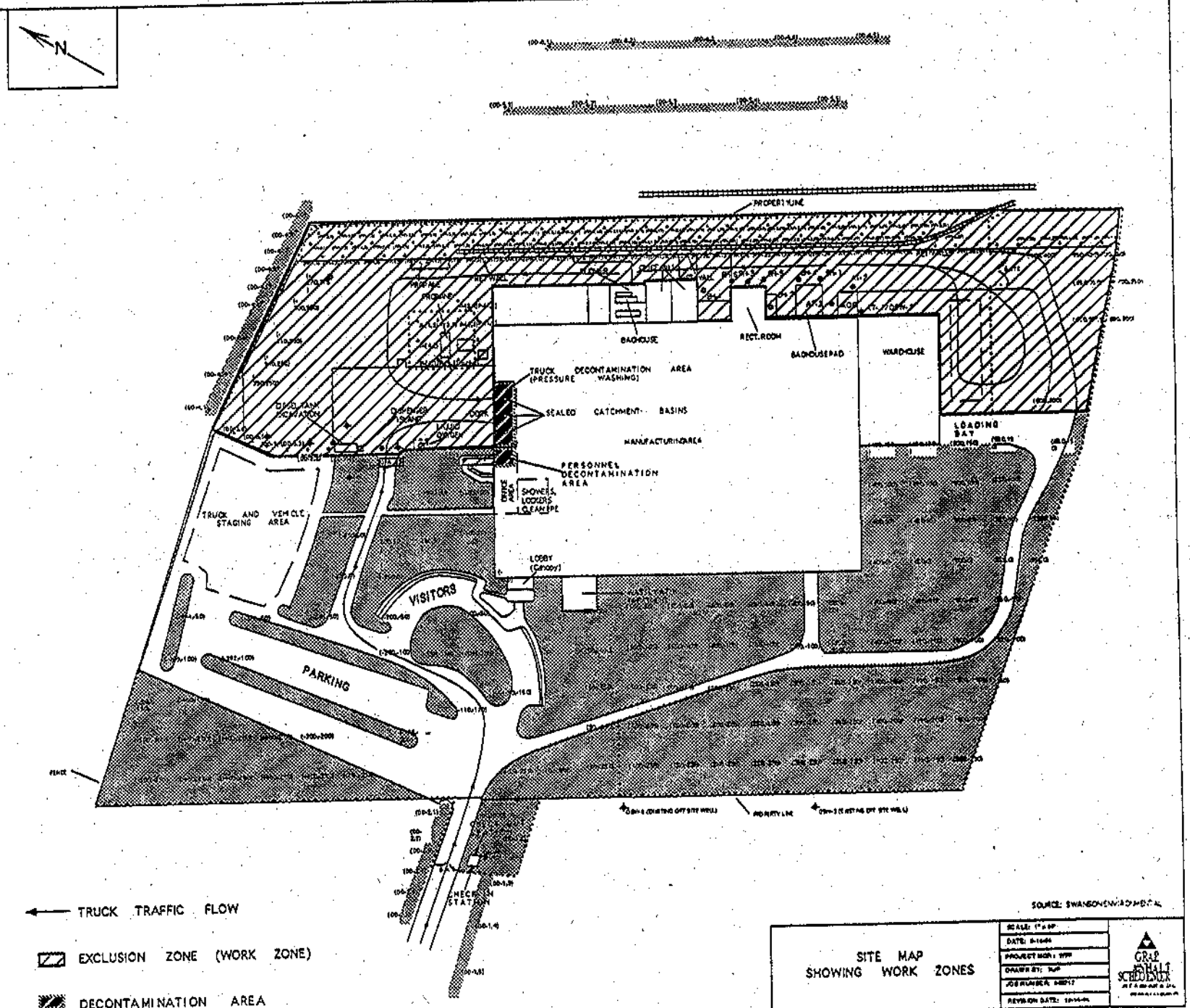


FIGURE 3

AREAS.CVS

- The gate on the south side of the facility will be opened for emergency situations and if the perimeter of the exclusion zone is reduced.
- Minimum PPE required for all personnel entering the exclusion zone will consist of Level C during excavation, loading, and backfilling. The levels of protection may be modified during the project when it is determined by the SM/SSO and PM that activities no longer pose risks (*i.e.*, after backfilling and grading, during seeding, mulching and surveying).

B. Decontamination / Reduction Zone

The heated inside loading dock area will be the designated truck decontamination area. Decontamination area will be established in an attached room for disposable equipment drop and reusable equipment storage. A hallway will lead to locker room with shower and wash facilities. The field office is down the hall along with exit to staging area (see Figure 3).

C. Support Zone

Showers and lockers (for clean clothes only) will be available for men and women adjacent to the site workers decontamination zone (illustrated on Figure 3).

D. Field Office

A field office will be established inside the building adjacent to the site workers' decontamination zone and support zone for general office work and first aid (illustrated on Figure 3).

E. Staging Zone

A paved area south of and adjacent to the south gate may be used to stage or store trucks and other equipment for the duration of the job (illustrated on Figure 3).

4. **Communication Procedures**

a. GAS personnel will keep in contact on site through the use of two-way radios.

b. The hand signals to be used anytime hearing is impaired are:

Thumbs Up: O.K.; I'm all right; I understand.

Thumbs Down: No; Negative.

Hands on Top of Head: I need assistance.

Grip Partner's Wrist or Both Hands Around Waist: Leave area IMMEDIATELY!

Hand Grasping Throat: Out of air; Can't breathe; Respirator problem.

G. AIR MONITORING PROTOCOL

1. Air Monitoring Procedures

a. Air monitoring during lead contaminated soil removal will be performed by the contractor using a MIE PDM-3 Miniram dust monitor. The Miniram is capable of sensing and measuring aerosol concentrations over the range of 0.01 to 100 mg/m^3. Measurements will be taken in the workers brathing zone and at the downwind boundary of the Exclusion Zone. GAS will record and document results of the air monitoring.

b. Air monitoring during the UST investigation will be accomplished using a Foxboro OVA 128 GC flame ionization detector (FID). Ambient air in the workers' breathing zone will be monitored for VOCs. Background readings will be subtracted (See Appendix D).

2. Field Calibration Procedures

Preventive maintenance for all instrumentation will be performed in accordance with the manufacturer's operation manuals. See Appendix D for step by step guideline for checking calibration of OVA.

H. PERSONAL PROTECTIVE EQUIPMENT

1. Introduction

GAS personnel will not work in areas requiring Level A personal protection equipment. The use of the two person buddy system is required when working in an area with Levels B or C protection. If protection Levels of A, B or C become necessary, GAS personnel will leave the affected area until conditions have been stabilized at protection Levels B, C, or D, and the necessary PPE and personnel are attained for protection Levels B or C.

2. Protective Clothing

a. Minimum PPE for Personnel On-Site (but not entering the exclusion zone)

Level D

- Coveralls/Work Clothes
- Disposable Tyvek or Poly Coated Tyvek (optional)
- Safety Boots/Shoes
- Rubber Overboots
- Hard Hat
- Safety Glasses/Face Shield (optional)
- Ear Protection (optional)
- Nitrile 4 mil Inner Gloves
- Latex 16 mil Outer Gloves (optional)
- See Appendix C.

b. Minimum PPE for Authorized Personnel Entering the Exclusion Zone (Work Area)

Level C

- Level D protection plus:
- Disposable Tyvek or Poly Coated Tyvek (required)
- Latex 16 mil Outer Gloves (optional / required for sampling)
- Tape Tyvek and Gloves to Ankles and Wrists (work / warm gloves may be worn over impermable gloves to protect from freezing temperatures, tears, or rips)
- Half Face or Full Face Air Purifying Respirator with HEPA filter / cartridge or Organic Vapor/HEPA Cartridges (HEPA filters / cartridges must be approved for respiratory protection against dust, fumes, and mists having a time-weighted average not less than 0.05 milligrams per cubic meter).
- See Appendix C.

c. Minimum PPE When Volatile Concentrations Exceed 300 PPM (300 IUs)

Level B

- Level C protection plus:
- North 85600 Pressure Demand Air Line Repirator
- Chemical-Resistant Hooded Coverall
- See Appendix C.

3. Respirators

- Each employee has been medically evaluated to determine that they are physically able to perform work while wearing respiratory protective equipment in compliance with 29 CFR Parts 1910.134 and ANSI 288.2-1980.

- Each employee who is determined physically able to perform work while wearing respiratory protective equipment and whose job classification may require wearing respiratory protective equipment is fit-tested annually to assure properly fitted respiratory protection.

- Each employee equipped with respiratory protection is instructed in respirator care, cleaning and usage annually.

- GAS personnel shall not wear facial hair which interferes with a satisfactory fit of the mask-to-face- seal while wearing a respirator.

- Contact lenses cannot be worn when respirator protection is required or when the hazard of a splash exists.

- Respirators shall be cleaned and disinfected after each day's use or more often if necessary by disassembling respirator and soaking parts in warm water with approved respirator cleaning agent.

- Respirators will be inspected for worn or deteriorated parts each day prior to being used. The inspection should include negative and positive air pressure checks using hands to cover inhalation / exhalation valves while checking for air leaks. Respirators and self-

contained breathing apparatus (SCBA) will be inspected and wiped down daily, disassembled and cleaned when necessary.

4. **Evaluating Levels of Protection**

a. During Lead Investigation / Remediation

All excavation work will be performed in modified Level C eliminating the need for aair monitoring.

b. During UST Investigations

Using an OVA, the hazardous concentrations of volatiles in the breathing zone will be monitored based on the STEL, PEL, IDLH and volatility of hazardous chemicals anticipated to be encountered onsite. THE CRITERIA used for levels of protection are as follows:

Background-150 IUs	Level D	Deviations from these levels will be based on the type of product on-site and its constituents.
150-300 IUs above background	Level C	
>300 IUs above background	Level B or A	

See Appendices C and D

IUs = Instrument Units

L EMPLOYEE EDUCATION AND TRAINING

GAS employees involved in site activities participate in routine health and safety education and training programs. These programs are designed to provide the employees with a knowledge of hazardous materials, health and safety hazard potentials and requirements of federal OSHA 29CFR 1910.120(e). Employees are required to have 40 hours of formal instruction. Supervisors are required to have an additional 8 hours of specialized training. Employees will have their training certifications with them on site. As a minimum, this training includes the following:

- General Safety Rules
- Basics of Chemistry
- Basics of Toxicology/Physiology
- Hazardous Materials (types/characteristics)
- Hazard Communication Information
- Respiratory Protection
- Respiratory Training
- Chemical Protective Clothing
- Decontamination Procedures/Personal Hygiene
- Fire Prevention/Protection
- First Aid/CPR
- Confined Space Work/Safety
- Atmospheric Testing/Sampling Procedures
- Emergency Response Procedures
- Electrical Hazard
- Federal and State Regulations

J. HEALTH SURVEILLANCE PROGRAM

All GAS employees involved with this work will have participated in a health surveillance program under the direction of an Occupational Physician. This program includes the following:

- Comprehensive Health and Exposure History
- Physical Evaluation
- Urinalysis
- SMAC 23 including total cholesterol and blood sugar
- Complete blood count (CBC), differential, hematocrit, and hemoglobin
- Chest X-ray
- Pulmonary Function Testing
- Vision Testing (distant, near)
- See Appendix E

Additionally, each employee has been evaluated to determine that they are physically able to perform work while wearing respiratory protective equipment in compliance with 29 CFR Part 1910.134 and ANSI Z88.2 - 1980. Each employee who is determined physically able to perform work while wearing respiratory protective equipment and whose job classification may require wearing respiratory protective equipment shall be fit tested annually to assure properly fitted respiratory protection. In addition, these employees will be instructed in respirator care, cleaning, and usage annually.

K. SPECIFIC DECONTAMINATION PROCEDURES

Personal Decontamination: A decontamination area will be designated separate from the active work zone. The area will be a decontamination zone and will be used for discarding disposable protective clothing and wash water, and for personal washing. Receptacles will be provided for collection of wash water and disposal of discarded protective clothing. All wastewater will be properly disposed of after characterization. An emergency first-aid kit and eye wash will be available for minor injuries.

1. PPE

- Remove and discard disposable PPE in designated container, including respirator cartridges.
- Clean non-disposable PPE with a general purpose decon solution.
- Non-disposable negative pressure respirators will be cleaned and disinfected by disassembling respirator and soaking the parts in warm water with approved respirator cleaning agent.

2. Equipment

- Wash with general purpose decon solution

The following decontamination line will be set up and clearly identified:

- Decontamination area (adjacent to truck / equipment decontamination area): this area is reserved for preliminary over-boot wash and sampling equipment storage

- Disposable equipment drop and reusable equipment storage: an attached room will be provided with disposable drying benches for disposable equipment and storage areas for reusable equipment
- Work clothing storage: locker room area, washroom and shower facilities, respirator cleaning station and storage
- Exit to field office or staging area

III. CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

A. INTRODUCTION

The original Contingency Plan/Emergency Response Plan will be kept in the GAS central file. A complete copy will be kept by the project manager and in all GAS site vehicles. A complete copy will be readily available to the project manager, alternate project managers, and personnel in charge on-site.

Copies of pages 1 through 4 will be posted at the nearest phone located in the field vehicle, and kept readily available to the project manager, alternate project managers, and personnel in charge on-site. The pages will be posted with the Site Safety Information Sheets as the first two pages, the Map of the Emergency Route to the Hospital as the third page, and the Site Map with Emergency Gathering Area as the fourth page.

The Contingency Plan consists of emergency response procedures that will be implemented when an imminent or actual incident could threaten human health or the environment. The emergency response procedure will be implemented in the following serious situations:

1. **Serious personal injury to anyone on site.**

2. **Fire and/or Explosion**

   a. if a fire could cause the release of toxic fumes

   b. if the fire could spread and ignite materials at other locations on-site or cause related heat-induced explosions

   c. if the fire could spread to off-site areas

   d. if the use of water or water and chemical fire suppressant could result in the release of contaminated runoff

   e. if an imminent danger exists that an explosion could occur

   f. if an explosion has occurred

3. **Spills or Material Leaks**

   a. if a spill could result in the release of hazardous liquids or vapors

   b. if a spill can be contained on-site, but the potential exists for possible groundwater contamination

   c. if a spill cannot be contained on-site

Note: See Appendix F for implementation of procedures.

B. SITE CONTROL

Physical access to the site granted by Owner to GAS shall be along Route 67A.

Check In / Check Out: All site personnel and equipment must be logged in before entering the site and logged out before leaving the site at the entrance gate guard shack (illustrated on Figure 3). Unauthorized personnel will not be allowed on-site.

Restricted Site Areas Include: the exclusion zone and decontamination / reduction zones.

C. EMERGENCY RESPONSE PROCEDURES

CALL 9-1-1

In the event of an emergency situation, the Bennington Fire Department will be notified in accordance with these emergency response procedures. After the Fire Department has been notified, the GAS Resident Project Representative will immediately notify the GAS Project Manager. If the Project Manager cannot be contacted, the prioritized list of people to contact, located on the first page of the Site Safety Information sheet, should be used.

D. COORDINATION AGREEMENTS

In case of an on-site safety accident involving GAS personnel, and prior to their transportation to the hospital, the primary on-scene responsibility transfers from the GAS Resident Project Representative to the appropriate fire department and/or the paramedics when they arrive at the site:

- Bennington Fire Department for emergency fire and medical assistance
- Southwestern Vermont Medical Center for assistance in treating possible injuries due to a medical emergency
- Bennington Police Department for assistance during spill emergencies

E. EMERGENCY ACTION - STANDARD OPERATING PROCEDURES

CALL 9-1-1

In the event of an accident or medical emergency, immediately call 9-1-1. In the unlikely event the line is busy or inoperable, appropriate agency numbers are listed below.

HOSPITAL:	Southwestern Vermont Medical Center **442-6314**
AMBULANCE:	**9-1-1**
FIRE DEPARTMENT:	Bennington Fire Department **9-1-1**
SHERIFF/POLICE:	Bennington Police Department **9-1-1**

F. MEDICAL EMERGENCIES

Any person who becomes ill or injured in the Exclusion Zone must be decontaminated and given consideration which risk, the spread of contamination or the health of the individual will be greater (Appendix G). If the injury or illness is minor, full decontamination would be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination would be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid will be administered while awaiting an ambulance or paramedics.

G. FIRST AID MEASURES - GENERAL

GAS personnel will adhere to time parameters for seeking definitive medical care for injuries and/or exposure which are discussed and agreed upon in the "Emergency Response Procedures". The following procedures will be used in the event that personnel exposure symptoms occur during contact with the following chemicals known to be present on site:

H. FIRST AID MEASURES - PRODUCTS AND LEAD CONTAMINATED SOILS

Eye Contact:	Flush eye immediately with copious amounts of emergency eye wash or water. Repeat until irritation is eliminated. If prolonged irritation occurs, seek medical attention.
Skin Contact:	Wash exposed area with emergency eye wash or soap and water. If dermatitis or severe reddening occurs, seek medical attention.
Inhalation:	Remove person into fresh air. If symptoms occur, seek medical attention.
Ingestion:	Do not induce vomiting; seek immediate medical attention.

Refer to attached hazardous constituent chemicals sheets (Appendix A) for information regarding chemical compounds which may be encountered during field procedures.

I. HOSPITAL:

Southwestern Vermont Medical Center
100 Hospital Drive
Bennington, Vermont
442-6314

The following are directions to Southwestern Vermont Medical Center from the Project Site:

From Johnson Controls exit, turn left on Highway 67A. Proceed southeast on Highway 67A to Belmont Drive. Turn right onto Belmont Drive and proceed south to Main Street (Highway 9). Turn left on Main Street (Highway 9); then an immediate right turn onto Dewey Street. Proceed south on Dewey Street to Hospital Drive East. Turn right on Hospital Drive East. Emergency Entrance is on north side of Hospital Drive East.

NOTE: Emergency routes to be verified and driven prior to any site activities.

J. FIRE OR EXPLOSION

The local fire department should be summoned immediately in the event of a fire or explosion. The field supervisor will advise the Fire Department Incident Commander, upon arrival, of the location, nature, and identification of the hazardous materials on-site. The field supervisor must be prepared to remain with the Fire Commander as an information resource.

If it is safe to do so and trained Fire Department staff are not yet on site, GAS employees may

1) Use fire-fighting equipment available on site to control or extinguish the fire.

2) Remove or isolate flammable or other hazardous materials which may contribute to the fire.

APPENDIX A

HEALTH DATA ON HAZARDOUS CHEMICALS POSSIBLY PRESENT

CHEMICAL	TWA	STEL (15 Min)	C	IDLH	PHYSICAL DESCRIPTION	UEL	LEL	RESPIRATOR REQUIREMENT	EFFECTS
Hydrochloric Acid Solution (HCl)	5 ppm	NA	5 ppm	100 ppm	Clear, colorless, fuming liquid with a pungent, irritating odor.	NA	NA	SA at 50 ppm PAPR at 5 ppm	Inflamation of nose and throat; cough, burns throat, eyes, skin; choking.
Lead (Pb)	0.100 mg/m3 (NIOSH) 0.050 mg/m3 (OSHA)	NA	NA	700 mg/m3	Heavy, ductile, soft gray solid	NA	NA	SA at 0.5 mg/m3	Weakness, lassitude, low weight, malnutrition, hypotension, anemia
Nitric Acid (HNO3)	2 ppm	4 ppm	NA	100 ppm	Colorless, yellow or red, fuming liquid with an acrid, suffocating odor	NA	NA	SA at 2 ppm PAPR at 6 ppm	Irritation of the eyes, mucous membranes, skin; delayed pulmonary edema. Burns eyes and skin.
Sodium Hydroxide Solution (NaOH)	NA	NA	2 mg/m3	250 mg/m3	Colorless, odorless liquid.	NA	NA	SA at 50 ppm	Irritation of nose; burns eyes and skin. Temporary loss of hair.
Sulfuric Acid	1 mg/m3	NA	NA	80 mg/m3	Colorless, dark brown oily, odorless liquid	NA	NA	PSA at 25 mg/m3 PAPR at 50 mg/m3	Eye, skin, mose and throat burns

Data Source: U.S. Department of Health and Human Services (1990), NIOSH Pocket Guide to Chemical Hazards, 245 pp.

NIOSH = National Institute for Occupational Safety and Health, TWA = Time-weighted Average, STEL = Short-term Exposure Limit, IDLH = Immediately Dangerous to Life or Health, UEL = Upper Explosive Level, LEL = Lower Explosive Level, SA = Supplied Air Respirator, PAPR = Powered, air purifying respirator. C = Ceiling

APPENDIX B

Incident/Injury/Illness Log

Site Incident Information:

Site Name: _____

Site Address: _____

_____

Site Phone Number: _____

Site Owner: _____

Reporting Information:

Date of Incident: _____

Time of Incident: _____

_____

Date of Incident Report: _____

_____

Reported By: _____

Incident Information:

Date of Incident: _____ Time of Incident: _____

Personnel Involved: _____ Any Witnesses: _____

Symptoms or Areas Affected: _____

_____

_____

Description of Incident or Exposure: _____

_____

_____

_____

_____

_____

_____

_____

Actions:

Was any Action Taken: ☐ Yes ☐ No; If Yes, _____

_____

_____

To whom was incident first reported: _____

Was Medical Attention Required? ☐ Yes ☐ No; If Yes, _____

_____

_____

Attending Physician: _____ Medical Facility: _____

Was any Medical Follow-up Required? ☐ Yes ☐ No, If Yes, _____

_____

_____

WINNART HANNAH ENGINEERING & ASSOCIATES INC
CONSULTING ENGINEERS
1987A2A4

RESIDENT PROJECT REPRESENTATIVE'S REPORT OF CONTRACTOR'S ACCIDENT

Date _____

DAY | S | M | T | W | TH | F | S |

Project _____

Unit _____

Proj. No. _____ Contract No. _____

WEATHER | | | | | |
TEMP. | | | | | |
WIND | | | | | |

Contractor: _____

Sub-Contractor: _____

Date of Accident: _____ Time: _____ AM/PM Location: _____

Description of Accident: _____

Primary Cause: _____

Contractor's Personnel or Equipment

Name of Injured Employee: _____ Age: _____

Occupation: _____ Sex: _____

Nature of Injury: _____

Degree of Injury: _____ First Aid ☐ Doctor Visit ☐ Hospital ☐ Fatality ☐

Type of Equipment: _____

Extent of Damage: _____

Other Persons or Property

Name of Injured Party: _____ Age: _____

Address: _____ City: _____ State: _____

Nature of Injuries: _____

Name of Property Owner: _____ Address: _____

Nature and Extent of Damages: _____

Was Use or Lack of Safety Equipment a Factor in This Accident: _____

If so, Explain: _____

What Safety Regulations Were Violated: _____

What Corrective Action Has Been Taken by the Contractor: _____

DISTRIBUTION:
1. Project Manager
2. Legal Staff
3. Engineer/Architect
4. Project File

Report by: _____

Title: _____

Wiley-Fisk Form 8-13

INCIDENT/INJURY/ILLNESS LOG

Site Incident Information:

Site Name: _____

Site Address: _____

_____

Site Phone Number: _____

Site Owner: _____

Reporting Information:

Date of Incident: _____

Time of Incident: _____

_____

Date of Incident Report: _____

_____

Reported By: _____

Incident Information:

Date of Incident: _____ Time of Incident: _____

Personnel Involved: _____ Any Witnesses: _____

Symptoms or Areas Affected: _____

_____

_____

Description of Incident or Exposure: _____

_____

_____

_____

_____

_____

_____

_____

Actions:

Was any Action Taken: ☐ Yes ☐ No; If Yes, _____

_____

_____

To whom was incident first reported: _____

Was Medical Attention Required? ☐ Yes ☐ No; If Yes, _____

_____

_____

Attending Physician: _____ Medical Facility: _____

Was any Medical Follow-up Required? ☐ Yes ☐ No, If Yes, _____

_____

_____

CONSULTING ENGINEERS
& ASSOCIATES INC
1087A2A4

RESIDENT PROJECT REPRESENTATIVE'S REPORT OF CONTRACTOR'S ACCIDENT

Date ______________

DAY

S	M	T	W	TH	F	S

WEATHER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TEMP.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WIND	[illegible]	[illegible]	[illegible]	[illegible]	

Project ______________

Unit ______________

Proj. No. ______________ Contract No. ______________

Contractor: ______________

Sub-Contractor: ______________

Date of Accident: ______________ Time: __________ AM/PM Location: ______________

Description of Accident: ______________

Primary Cause: ______________

Contractor's Personnel or Equipment

Name of Injured Employee: ______________ Age: ______

Occupation: ______________ Sex: ______

Nature of Injury: ______________

Degree of Injury: ______ First Aid ☐ Doctor Visit ☐ Hospital ☐ Fatality ☐

Type of Equipment: ______________

Extent of Damage: ______________

Other Persons or Property

Name of Injured Party: ______________ Age: ______

Address: ______________ City: ______________ State: ______

Nature of Injuries: ______________

Name of Property Owner: ______________ Address: ______________

Nature and Extent of Damages: ______________

Was Use or Lack of Safety Equipment a Factor in This Accident: ______________

If so, Explain: ______________

What Safety Regulations Were Violated: ______________

What Corrective Action Has Been Taken by the Contractor: ______________

DISTRIBUTION:
1. Project Manager
2. Legal Staff
3. Engineer/Architect
4. Project File

Report by: ______________

Title: ______________

Wiley-Fisk Form 8-13

APPENDIX C

Level of Protection	PPE	Protection Provided	Should be Used When:	Limiting Criteria
A	Recommended: • Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA. • Fully-encapsulating, chemical-resistant suit. • Inner chemical-resistant gloves. • Chemical-resistant safety boots/shoes. • Two-way radio communications. Optional: • Cooling unit. • Hard hat. • Disposable boot covers.	The highest available level of respiratory, skin, and eye protection.	• The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either: 1. measured for potential for high concentration of atmospheric vapors, gases, or particulates or 2. site operations and work functions involving a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin. • Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible. • Operations must be conducted in confined, poorly ventilated areas until the absence of conditions requiring Level A protection is determined.	• Fully-encapsulating suit material must be compatible with the substances involved.

Level of Protection	PPE	Protection Provided	Should be Used When:	Limiting Criteria
	• Face shield. • Escape mask.			
B	Recommended: • Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA.	The same level of respiratory protection but less skin protection than Level A.	• The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres:	• Use only when the vapor or gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin.
	• Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit).	It is the minimum level recommended for initial site entries until the hazards have been further identified.	1. with IDLH concentrations of specific substances that do not represent a severe skin hazard;	• Use only when it is highly unlikely that the work being done will generate either high concentrations of vapors, gas, or particulates or splashes of material that will affect exposed skin.
	• Inner and outer chemical-resistant gloves.		or 2. that do not meet the criteria for use of air-purifying respirators.	
	• Chemical-resistant safety boots/shoes.			
	• Two-way radio communications.		• Atmosphere contains less than 19.5 percent oxygen.	
			• Presence of incompletely identified vapors or gases is indicated by direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.	
	Optional: • Disposable boot covers.			
	• Face shield.			

Level of Protection	PPE	Protection Provided	Should be Used When:	Limiting Criteria
D	Recommended: • Coveralls.	No respiratory protection. Minimal skin protection.	• The atmosphere contains no known hazard.	• This level should not be worn in the Exclusion Zone.
	• Safety boots or shoes.		• Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.	• The atmosphere must contain at least 19.5 percent oxygen.
	• Safety glasses or goggles.			
	• Hard hat.			
	Optional: • Gloves.			
	• Escape mask.			
	• Face shield.			
C	Recommended: • Full-facepiece, air-purifying, canister-equipped respirator.	The same level of skin protection as Level B, but a lower level of respiratory protection.	• The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin.	• Atmospheric concentration of chemicals must not exceed IDLH levels.
	• Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit).		• The types of air contaminants have been identified, concentrations measured, and a canister is available that can remove the contaminants.	• The atmosphere must contain at least 19.5 percent oxygen.
	• Inner and outer chemical-resistant gloves.		• All criteria for the use of air-purifying respirators are met.	
	• Chemical-resistant safety boots or shoes.			
	• Hard hat.			
	Optional: • Disposable boot covers.			
	• Two-way radio communications.			

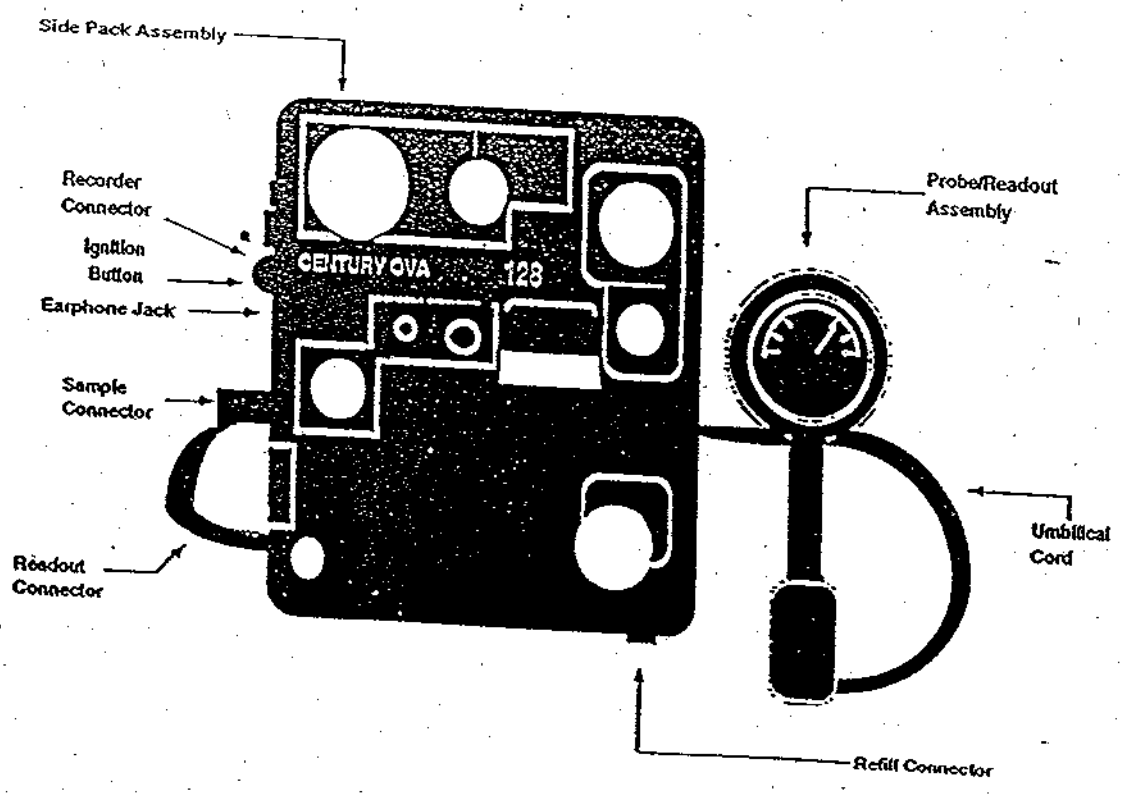
APPENDIX D

MODEL OVA 128
CENTURY ORGANIC VAPOR ANALYZER

GENERAL DESCRIPTION

The OVA 128 Analyzer is designed to detect and measure hazardous organic vapors and gases found in most industries. It has broad application since it has a chemically resistant sampling system and can be calibrated to almost all organic vapors. It can provide accurate indication of gas concentration in one of three ranges: 0 to 10 ppm; 0 to 100 ppm and 0 to 1000 ppm. While designed as a lightweight portable instrument, it can be permanently installed to monitor a fixed point.

The instrument utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors. The instrument measures organic vapor concentration by producing a response to an unknown sample, which can be related to a gas of known composition to which the instrument has previously been calibrated. During normal survey mode operation, a continuous sample is drawn into the probe and transmitted to the detector chamber by an internal pumping system.



The sample stream is metered and passed through particle filters before reaching the detector chamber. Inside the detector chamber, the sample is exposed to a hydrogen flame which ionizes the organic vapors. When most organic vapors burn, they leave positively charged carbon-containing ions. An electric field drives the ions to a collecting electrode. As the positive ions are collected, a current corresponding to the collection rate is generated. This current is measured with a linear electrometer preamplifier which has an output signal proportional to the ionization current. A signal conditioning amplifier is used to amplify the signal from the preamp meter or external recorder display. The display is an integral part of the Probe/Readout Assembly and has 270° scale deflection.

In general, the hydrogen flame ionization detector is more sensitive for hydrocarbons than any other class of organic compounds. The response of the OVA varies from compound to compound, but gives repeatable results with all types of hydrocarbons; i.e., saturated hydrocarbons (alkanes), unsaturated hydrocarbons (alkenes and alkynes) and aromatic hydrocarbons.

APPENDIX E

Graef, Anhalt, Schloemer and Associates Inc.

Presents this certificate to

Eric Chudzik

for the completion of the
8-Hour Hazardous Waste Site Worker
Refresher Training Program
October 26th., 1994

Conducted by
Safety Compliance Consultants & Trainers, Inc.
Green Bay, WI

Program Contents:
Toxicology
Hazard Recognition
Monitoring
Respiratory Protection
Confined Space Regulations
Excavation Safety
Personal Protection Equipment
Safe Work Practices
Decontamination Procedures
Site Health & Safety Plans

Robert A. Ehlert, CET, CHMM
Trainer

University of Wisconsin-Madison
College of Engineering

The Department of Engineering Professional Development

proudly presents this award for
educational achievement to

Eric Chudzik

for successful completion of the 40-hour training program

Health and Safety Training for Superfund and RCRA Remediation Site Personnel

April 24 - 27, 1989

Michael T. Klemann
Program Director

John T Leighty
Chairman of the Department

Graef, Anhalt, Schloemer and Associates Inc.

Presents this certificate to

Jim Kasdorf

for the completion of the 8-hour
Hazardous Waste Site
Personnel Refresher Training

January 31st., 1994

conducted by
Safety Compliance Consultants & Trainers, Inc.

Program Contents:
Toxicology
Hazard Recognition
Monitoring Devices
Cartridge Respirators
Confined Space Regulations and Safe Procedures
Excavation Regulations and Safe Procedures
Personal Protection Clothing
Decontamination Procedures
Site Health and Safety Plans

Robert A. Ehlert, CET
Trainer

LAKESHORE
TECHNICAL COLLEGE

This certificate is presented to

James H. Kasdorf

for completion of 40 hours

March 18-22, 1991

in the General Site Worker Program

designed by:

The Midwest Consortium for

Hazardous Waste Worker Training

Composed of: University of Cincinnati; The Greater Cincinnati Occupational Health Council; University of Illinois; University of Kentucky; Michigan State University; the Southeast Michigan Committee on Occupational Health; University of Michigan; Purdue University; Lakeshore Technical College, WI; University of Louisville; University of Minnesota; Roane State Community College, Tennessee; American Federation of State, County and Municipal Employees; and UBC Health and Safety Fund, Washington, D.C.

Program Contents

Hazardous Recognition
Hazard Control
Monitoring
Non-Respiratory Personal Protective Equipment
Respiratory Equipment
Work Practices
Emergency Response
Rights and Responsibilities

Lakeshore Technical College
Hazardous Materials Staff

District Director/President

OS 10/90

TRIAD

CERTIFICATION

Name: R. Bruce Bowers

Employer: Triad Engineering, Incorporated
11 Warehouse Road
Harrisonburg, Virginia 22801

To Whom It May Concern:

TRIAD ENGINEERING, INCORPORATED hereby certifies that in accordance with the provisions of 29 CFR 1910.120 (e)(9), which section provides that:

> "Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(1) through (e)(4) of this section shall not be required to provide the initial training requirements of those paragraphs to such employees.",

R. Bruce Bowers has had sufficient training and first hand experience in hazardous waste operations to possess training equivalent to the initial training referenced above.

A brief synopsis of M. Bowers' education and experience is attached to this certification.

Respectfully,
TRIAD ENGINEERING, INCORPORATED

Wallace Schwartz
Health and Safety Director

Mark E. Pennington, P.E., M.S.
Vice President

DATED: October 19, 1992

TRIAD

R. BRUCE BOWERS, E.I.T.

PROJECT MANAGER/ENGINEER

EDUCATION:

B.S.C.E. - Structures & Hydrology - 1983 - West Virginia University

M.S.C.E. - Environmental Engineering - 1988 - West Virginia University

Ph.D. - Environmental Engineering - West Virginia University (diploma pending)

PROFESSIONAL EXPERIENCE:

Environmental Engineer	- Triad Engineering, Inc., Harrisonburg, VA, 1989 to present
Instructor	- Fairmont State College, Fairmont, WV 1986 to 1989
Environmental Engineer	- David Taylor Naval Ship R & D Center Annapolis, MD, 1987
Design Engineer	- Erwin Industries, Inc., Fairmont, WV 1984 to 1985

PERTINENT EXPERIENCE:

Eight (8) years experience in civil and environmental engineering. Proficient in structural analysis, design of small structures, and design of shallow foundation systems. Intense environmental engineering background with four (4) years experience which includes the following:

- Hazardous/municipal waste disposal.
- UST site closures.
- Environmental Site Assessments (ESA Level I & II) to include site investigations, hydrogeologic assessments, and analytical laboratory testing.
- Site risk and remediation assessments, and corrective action plans (CAP) for LUST sites.
- Development of oil discharge contingency (ODC) plans in the Commonwealth of Virginia.
- Land Application Permitting for land application of treated wastewater effluent which includes site hydrogeologic studies.
- Groundwater sampling and analysis for sanitary landfills.

FEDERATION OF ENVIRONMENTAL TECHNOLOGISTS

certifies that

WAYNE FASSBENDER

has successfully completed the

CERTIFIED HAZARDOUS MATERIAL MANAGER REVIEW COURSE

MARCH 3, 1994

Date

Anthony D. Montemurro

CHMM Wisconsin Chapter

Alan K. Haase

FET

University of Wisconsin-Madison
College of Engineering

The Department of Engineering Professional Development

proudly presents this award for
educational achievement to

Wayne Fassbender

for successful completion of the 40-hour training program

Health and Safety Training for Superfund and RCRA Remediation Site Personnel

March 13 - 16, 1989

UNIVERSITY OF WISCONSIN-MADISON

Michael T. Wehrman
Program Director

John T Leighty
Chairman of the Department

University of Wisconsin-Madison
College of Engineering

The Department of Engineering Professional Development

proudly presents this award for
educational achievement to

Bassem Haddad

for successful completion of the 40-hour training program

Health and Safety Training for Superfund and RCRA Remediation Site Personnel

June 11 - 14, 1990

Michael F. Berman
Program Director

John T. Quigley
Chairman of the Department

Graef, Anhalt, Schloemer and Associates Inc.

Presents this certificate to

Bassem Haddad

for the completion of the 8-hour
Hazardous Waste Site
Personnel Refresher Training

January 31st., 1994

conducted by
Safety Compliance Consultants & Trainers, Inc.

Program Contents:
Toxicology
Hazard Recognition
Monitoring Devices
Cartridge Respirators
Confined Space Regulations and Safe Procedures
Excavation Regulations and Safe Procedures
Personal Protection Clothing
Decontamination Procedures
Site Health and Safety Plans

Robert A. Ehlert, CET
Trainer

APPENDIX F

Serious Personal Injury

Emergency Response will be Implemented in the Following Manner

There is a serious personal injury.

STOP!

Stop and survey the scene.

- Is it safe for you to approach the victim?
- Look for clues to what happened.
- How many people are injured?
- Is there anyone present to help you?
- Identify yourself as a trained rescuer.

Do a primary survey of the victim(s).

- Do not move the victim(s) unless you or the victim(s) is in immediate danger from a hazard at the scene.
- Yell "HELP!"
- Check the ABC's
  - Airway
  - Breathing
  - Circulation

Phone the Emergency Medical Services (EMS) for help.

- If someone is present to help you, send them to call EMS.
- Give the caller the EMS phone number.
- Tell the caller to give the following information:
  - Where you are.
  - Telephone number from which call is being made.
  - Callers name.
  - What happened?
  - How many persons injured?
  - Condition of victim(s).
  - Help (first aid) being given.

Do a secondary survey of site.

- Interview the victim(s)
  - Name?
  - Age?
  - Medications?
  - Medical problems?
  - How he/she feels?
  - Where does it hurt?
  - Write information down, if possible.
- Determine the following:
  - Is breathing normal?
  - Is pulse normal?
  - Is body temperature normal?

Call the project manager.

- If the project manager is not available, use the prioritized list of people to notify in case of an emergency.

Fire and/or Explosion

Emergency Response will be Implemented in the Following Manner

There is a fire or explosion!

STOP!

Stop and survey the scene.

- Can you extinguish the fire with equipment available on site?
- Are there any victims?
- Has there been a spill associated with the fire and/or explosion?
- Are there flammable materials nearby?

If you cannot extinguish the fire with equipment on site...

CALL THE FIRE DEPARTMENT

- ell the Fire Department where you are.
- rovide telephone number from which the call is being made.
- ive your name.
- escribe what has happened.
- form dispatcher if there are any injuries.
- ollow any instructions given.

Call the project manager.

- If the project manager is not available, use the prioritized list of people to be contacted in case of an emergency.

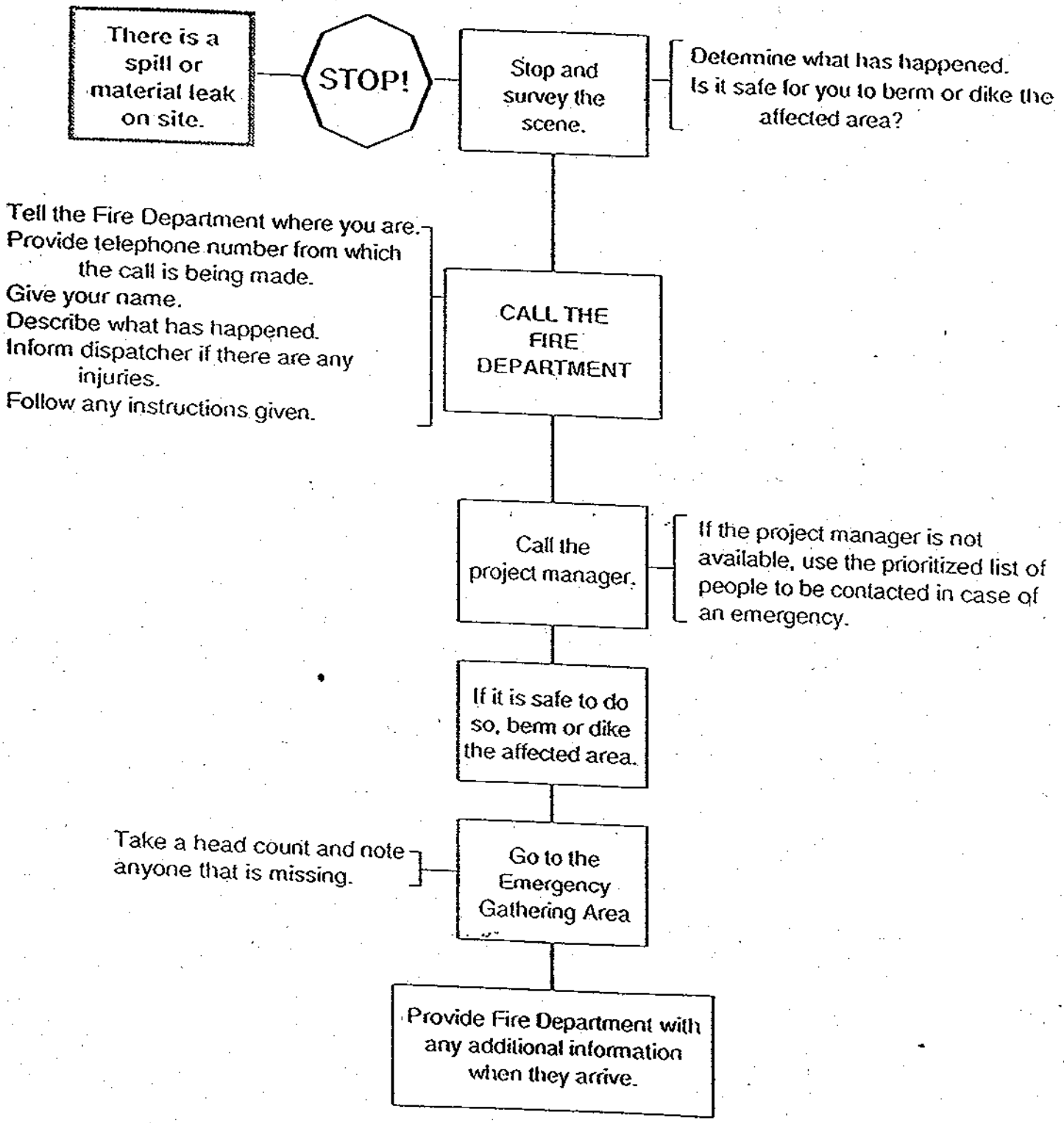
Go to the Emergency Gathering Area

- Take a head count and note anyone that is missing.

Provide Fire Department with any additional information when they arrive.

Spills & Materials Leaks

Emergency Response will be Implemented in the Following Manner



Non-serious Injury

Respond in the Following Manner

There is a non-serious personal injury on site.

If the victim can move under their own power, but needs medical assistance...

- **Call the hospital.**
  - Provide your name to hospital.
  - Provide the victim's name to hospital.
  - Describe the incident.
  - Give expected arrival time at the hospital.
- **Transport the victim to the hospital.**
- **Call the project manager.**
  - If the project manager is not available, use the prioritized list of people to be contacted in case of an emergency.

APPENDIX C

FIELD WATER QUALITY SAMPLING AND ANALYSIS LOG

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

PROJECT: JOHNSON CONTROLS
PROJECT NO.: 948724
LOCATION: R-67A, BENNINGTON, VERMONT
LABORATORY: SPECIALIZED ASSAYS ENVIRONMENTAL
DATE SENT: 1/26/95

INSTRUMENT IDENTIFICATION:
TEMPERATURE: #2
CONDUCTIVITY: #2
pH: #2
PUMP: NA

SAMPLE LOCATION	MW-1	MW-2	MW-3	MW-4	MW-5
TYPE	MONITORING WELL	MONITORING WELL	MONITORING WELL	MONITORING WELL	MONITORING WELL
DATE/TIME	1/25/95; 4:25	1/25/95; 4:44	1/25/95; 8:28	1/25/95; 2:44	1/25/95
WELL DEPTH (FT.)	12.92	12.72	13.00	15.40	15.48
DEPTH TO GW (FT.)	1.52	4.44	5.16	5.89	5.30
WATER COLUMN (FT.)	11.40	8.28	7.84	9.51	10.18
WELL VOLUME (GAL)	1.74	1.69	1.82	1.35	1.57
PURGE VOLUME (GAL)	5.0	5.0	4.0	5.0	Not Sampled
MP ELEV. (FT.)	99.02	98.75	97.12	103.03	101.67
GW ELEV. (FT.)	96.96	96.59	96.38	96.09	96.37
SAMPLING DEVICE	BAILER	BAILER	BAILER	BAILER	
TEMPERATURE (°C)	7.8	8.8	6.0	8.0	
CONDUCTIVITY (Us/cm) (ms/cm)	0.70	0.49	0.45	1.06	
pH	7.83	7.89	8.46	7.79	
DISSOLVED OXYGEN (ppm)	—	—	—	—	
COLOR	GRAYISH BROWN	GRAYISH BROWN	GRAYISH BROWN	GRAYISH BROWN	
ODOR	NONE	NONE	NONE	NONE	
CLARITY	TURBID	CLOUDY	CLOUDY	CLOUDY	
SAMPLING PARAMETERS	NO.OF CONTAINERS & CONTAINER TYPE & VOA, PLASTIC, AMBER ETC. PRESERVATIVE TYPE & FILTERED OR UNFILTERED				
VOC. 8240	(3) 40 ml AMBER VOA VIALS WITH HCL	(3) 40 ml AMBER VOA VIALS WITH HCL	(3) 40 ml AMBER VOA VIALS WITH HCL	(3) 40 ml AMBER VOA VIALS WITH HCL	(3) 40 ml AMBER VOA VIALS WITH HCL
TPH. 8015	(1) LITER AMBER BOTTLE, NO PRESERVATIVE	(1) LITER AMBER BOTTLE, NO PRESERVATIVE	(1) LITER AMBER BOTTLE, NO PRESERVATIVE	(1) LITER AMBER BOTTLE, NO PRESERVATIVE	(1) LITER AMBER BOTTLE, NO PRESERVATIVE
SAMPLED BY:	JK	JK	JK	JK	JK
REMARKS:	SLOW RECHARGE	SLOW RECHARGE	SLOW RECHARGE, BAILED DRY AT 4 GAL, ALLOWED TO RECHARGE THEN SAMPLED	SLOW RECHARGE	BENTONITE IN WELL AT 5.65' BMP

FIELD WATER QUALITY SAMPLING AND ANALYSIS LOG

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

PROJECT: JOHNSON CONTROLS
PROJECT NO.: 948724
LOCATION: BENNINGTON, VERMONT
LABORATORY: SPECIALIZED ASSAYS ENV.
DATE SENT: 1/26/95

INSTRUMENT IDENTIFICATION:
TEMPERATURE: #2
CONDUCTIVITY: #2
pH: #2
PUMP: NA

SAMPLE LOCATION	OSW-1	OSW-2	OSW-3	MW-6	MW-7	DUP-3A
TYPE	MON. WELL	MON. WELL	MON. WELL	MON. WELL	MON. WELL	MON. WELL
DATE/TIME	1/25/95; 11:58	1/25/95; 9:45	1/25/95; 10:35	1/25/95; 3:16	1/26/95; 2:01	1/26/95; 2:01
WELL DEPTH (FT.)	17.60	18.94	15.06			
DEPTH TO GW (FT.)	4.76	3.53	7.23	7.14	4.80	
WATER COLUMN (FT.)	12.84	15.41	7.83			
WELL VOLUME (GAL)	2.07	2.49	1.27			
PURGE VOLUME (GAL)	6.0	6.0	6.0	5.00	5.0	
MP ELEV. (FT. MSL)		91.87	91.90			
GW ELEV. (FT. MSL)		88.34	84.67			
SAMPLING DEVICE	BAILER	BAILER	BAILER	BAILER	BAILER	
TEMPERATURE (°C)	9.9	6.3	6.8	7.8	7.2	
CONDUCTIVITY (Us/cm) (ms/cm)	1.97	0.41	0.39	0.70	0.56	
pH	7.33	6.93	7.60	7.83	11.15	
DISSOLVED OXYGEN (ppm)	—	—	—	—	—	—
COLOR	BROWNISH GRAY	DARK BROWN	DARK BROWN	GRAYISH BROWN	GRAY	
ODOR	NONE	NONE	NONE	NONE	PETROLEUM	
CLARITY	CLOUDY	TURBID	TURBID	CLOUDY	CLOUDY	
SAMPLING PARAMETERS	NO. OF CONTAINERS & CONTAINER TYPE: VOA, PLASTIC, AMBER, ETC. PRESERVATIVE TYPE: FILTERED OR UNFILTERED					
VOC. 8240	(3) 40 ml AMBER VOA VIALS WITH HCL			(3) 40 ml AMBER VOA VIALS WITH HCL	(3) 40 ml AMBER VOA VIALS WITH HCL	
TPH. 8015	(1) LITER AMBER BOTTLE, NO PRESERVATIVE			(1) LITER AMBER BOTTLE, NO PRESERVATIVE	(1) LITER AMBER BOTTLE, NO PRESERVATIVE	
FILTERED Pb	(1) LITER AMBER BOTTLE, HNO3, FILTERED	(1) LITER AMBER BOTTLE, HNO3, FILTERED	(1) LITER AMBER BOTTLE, HNO3, FILTERED			
SAMPLED BY:	JK	JK	JK	JK	JK	JK
REMARKS:			GOOD RECHARGE	SLOW RECHARGE	SLOW RECHARGE	DUPLICATE SAMPLE FROM MW-7

FIELD WATER QUALITY SAMPLING AND ANALYSIS LOG

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

PROJECT: JCBGI REMEDIAL INVEST.
PROJECT NO.: 948530
LOCATION: BENNINNGTON, VT.
LABORATORY: SPECIALIZED ASSAYS ENV.
DATE SENT: 12/10/94

INSTRUMENT IDENTIFICATION:
TEMPERATURE: #1
CONDUCTIVITY: #1
pH: #1
PUMP:

SAMPLE LOCATION	OSW-3	OSW-2	OSW-1	MW-1	MW-2
TYPE	GW	GW	GW	GW	GW
DATE/TIME	12/7/94 8:40	12/7/94 9:30	12/7/94 11:30	12/7/94 4:10	12/7/94 4:40
WELL DEPTH (FT.)	14.65	17.95	17.60	12.92	12.72
DEPTH TO GW (FT.)	7.33	5.20	5.76	1.53	2.03
WATER COLUMN (FT.)	7.32	12.75	11.84	11.39	10.69
WELL VOLUME (GAL)	1.17	2.04	1.89	1.83	1.71
PURGE VOLUME (GAL)	6.00	11.00	7.50	9.00	8.50
MP ELEV. (FT. MSL)	91.90	91.87	106.55	99.02	98.75
GW ELEV. (FT. MSL)	84.57	86.67	100.79	97.49	96.72
SAMPLING DEVICE	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER
TEMPERATURE (°C)	7.20	7.10	9.80	8.87	10.40
CONDUCTIVITY (Us/cm)	7.20	7.40		887.00	796.00
(ms/cm)			3.36		
pH	7.49	7.51	6.65	7.65	7.40
DISSOLVED OXYGEN (ppm)	---	---	---	---	---
COLOR	LIGHT BROWN	LIGHT BROWN	LT GRAYISH BROWN	BROWN	CLEAR
ODOR	NONE	NONE	SL. PETRO.	NONE	NONE
CLARITY	TURBID	TURBID	SL TURBID	TURBID	SL TURBID
SAMPLING PARAMETERS:	NO. OF CONTAINERS & CONTAINER TYPE: VOA, PLASTIC, AMB, ETC. PRESERVATIVE TYPE: FILTERED OR UNFILTERED				
FIELD FILTERED Pb	1 L AMB; HNO3; FF	1 L AMB; HNO3; FF	1 L AMB; HNO3; FF		
EPA 8015			1 L AMB	1 L AMB	1 L AMB
EPA 8240			(3) VOA	(3) VOA	(3) VOA
SAMPLED BY:	EMC	EMC	EMC	EMC	EMC
REMARKS :					

FIELD WATER QUALITY SAMPLING AND ANALYSIS LOG

GRAEF ANHALT SCHLOEMER and Associates Inc.
ENGINEERS & SCIENTISTS

PROJECT: JCBGI REMEDIAL INVEST.
PROJECT NO.: 948530
LOCATION: BENNINNGTON, VT.
LABORATORY: SPECIALIZED ASSAYS ENV.
DATE SENT: 12/10/94

INSTRUMENT IDENTIFICATION:
TEMPERATURE: #1
CONDUCTIVITY: #1
pH: #1
PUMP:

SAMPLE LOCATION	MW-3	MW-5	MW-4	MW-6	MW-7
TYPE	GW	GW	GW	GW	GW
DATE/TIME	1/5/04 16:33	12/7/94 5:44	12/7/94 6:35	12/10/94 6:40	12/10/94 7:10
WELL DEPTH (FT.)	16.00	15.48	15.40	15.00	12.00
DEPTH TO GW (FT.)	4.69	5.24	6.04	7.21	4.78
WATER COLUMN (FT.)	11.31	10.24	9.36	7.79	7.22
WELL VOLUME (GAL)	1.80	1.64	1.50	1.25	1.16
PURGE VOLUME (GAL)	9.00	10.00	7.50	7.50	6.00
MP ELEV. (FT. MSL)	97.12	101.67	103.03		
GW ELEV. (FT. MSL)	92.43	96.43	96.99	-7.21	-4.78
SAMPLING DEVICE	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER	DISPOSABLE BAILER
TEMPERATURE (°C)	6.10	9.00	10.20	10.20	5.80
CONDUCTIVITY (Us/cm) (ms/cm)	197.00	896.00	7.00	707.00	1091.00
pH	7.90	7.25	7.10	7.15	7.75
DISSOLVED OXYGEN (ppm)	—	—	—	—	—
COLOR	CLEAR	CLEAR	CLEAR	LT BROWN	LT BROWN
ODOR	NONE	NONE	NONE	NONE	NONE
CLARITY	SL. TURBID	CLEAR	CLEAR	SL. TURBID	SL. TURBID
SAMPLING PARAMETERS:	NO. OF CONTAINERS & CONTAINER TYPE (VOA, PLASTIC/AMB. BTL.), PRESERVATIVE TYPE, FILTERED OR UNFILTERED				
FIELD FILTERED Pb					
EPA 8015	1 L AMB	1 L AMB	1 L AMB	1 L AMB	1 L AMB
EPA 8240	(3) VOA	(3) VOA	(3) VOA	(3) VOA	(3) VOA
SAMPLED BY:	EMC	EMC	EMC	EMC	EMC
REMARKS:					

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
JOHNSON CONTROLS - BENNINGTON		SB-8/MW-6

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
SOIL AND MATERIAL TESTING, INC. RICHARD STONEY	12/08/94	12/08/94	HOLLOW STEM AUGER

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water	Surface Elevation	Borehole Diameter
		NA	NA	NA	8.5 INCHES

Boring Location State Plane	Lat Long	Local Grid Location (if applicable)

County	DNR County Code	Civil Town/City/ or Village
BENNINGTON		BENNINGTON

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			1	0.0 - 1.0: TURF, TOPSOIL										
			2	1.0 - 6.5: SILT, some sand, fine to, medium, light brown, few gravel. Trace cobbles at 5.0 ft.										
			3											
			4											
			5											
			6											
			7	6.5 - 13.5: SILTY SAND AND GRAVEL										
			8											
			9											
			10											
			11											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Graef Anhalt Schloemer and Associates Inc.

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	RQD/ Comments
			13											
			14	EOB SB-8/MW-6 AT 13.5 FT BGS.										
			15											
			16											
			17											
			18											
			19											
			20											
			21											
			22											
			23											
			24											
			25											
			26											
			27											
			28											
			29											
			30											
			31											

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
JOHNSON CONTROLS - BENNINGTON		SB-9/MW-7

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
SOIL AND MATERIAL TESTING, INC. RICHARD STONEY	12/08/94	12/08/94	HOLLOW STEM AUGER

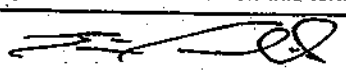
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water	Surface Elevation	Borehole Diameter
		NA	NA	NA	8.5 INCHES

Boring Location State Plane	Lat Long	Local Grid Location (if applicable)

County	DNR County Code	Civil Town/City/ or Village
BENNINGTON		BENNINGTON

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			1	0.0 -1.0: FILL										
			2	1.0 - 9.8: SILTY SAND and GRAVEL, some angular limestone 3/4" - 13/4", petro odor, wet.										
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	EOB SB-9/MW-7 AT 9.8 FT BGS. CONCRETE OBSTRUCTION, EXTRA LARGE, ENCOUNTERED AT SAME DEPTH IN 3 LOCATIONS.										
			11											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Graef Anhalt Schloemer and Associates Inc.

Facility/Project Name
JCBGI BENNINGTON, VT

Facility License, Permit or Monitoring Number

Grid Location
_____ ft. ☐N. ☐S.
_____ ft. ☐E. ☐W.

Well Name
MW-6

Wis. Unique Well Number | DNR Well Number

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location
____ 1/4 ____ of 1/4 of Section ____.
T ____ N, R ____ ☐E ☐W

Date Well Installed: 12 m m / 08 d d / 94 y y

Distance Well is From Waste/Source Boundary: 36 ft.

Location of Well Relative to Waste/Source: ☐Upgradient ☐Sidegradient ☐Downgradient ☐Not Known

Well Installed By: (Person's Name and Firm)
SOILS & MATRIALS TESTING
STONEY

Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

A. Protective pipe, top elevation ft. MSL
B. Well casing, top elevation ft. MSL
C. Land surface elevation ft. MSL
D. Surface seal, bottom ft. MSL or ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☒ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; _____ Other ☐

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
_____

E. Bentonite seal, top ft. MSL or 0.5 ft.
F. Fine sand, top ft. MSL or ft.
G. Filter pack, top ft. MSL or 2.0 ft.
H. Well screen, top ft. MSL or 2.5 ft.
I. Well screen, bottom ft. MSL or 12.5 ft.
J. Filter pack, bottom ft. MSL or 13.5 ft.
K. Borehole, bottom ft. MSL or 13.5 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.03 in.
N. I. D. well casing 2.30 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length 4.5 ft.
c. Material: Steel ☒ 04; _____ Other ☐
d. Additional protection: ☐ Yes ☐ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; _____ Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐; _____ Other ☐
5. Annular space seal: ____ Granular Bentonite ☒ 33; ____ Lbs/gal mud weight..Bentonite sand slurry ☐ 35; ____ Lbs/gal mud weight.....Bentonite slurry ☐ 34; ____ % Bentonite.....Bentonite-cement grout ☐ 50; ____ Ft^3 volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☒ 33; ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐; _____ Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
#30 SIEVE
Volume added 2.4 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; _____ Other ☐
10. Screen Material: PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; _____ Other ☐
Manufacturer _____
Slot size: 0.010 in.
Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☐; _____ Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm GRAEF, ANHALT, SHLOEMER AND ASSOCIATES, INC.

948530.MW-6

Facility /Project	Well Name
JCBGI BENNINGTON, VT	MW-6
License, Permit or Monitoring	Wis. Unique Well Number / DNR Well Number

1. Can this well be purged dry? [X] Yes [ ] No

2. Well development method

surged with bailer and bailed	[X]	41
surged with bailer and pumped	[ ]	61
surged with block and bailed	[ ]	42
surged with block and pumped	[ ]	62
surged with block, bailed and pumped	[ ]	70
compressed air	[ ]	20
bailed only	[ ]	10
pumped only	[ ]	51
pumped slowly	[ ]	50
Other _____	[ ]	

3. Time spent developing well 360 min.

4. Depth of well (from top of casing) 14.7 ft.

5. Inside diameter of well 2.03 in.

6. Volume of water in filter pack and well casing 7.9 gal.

7. Volume of water removed from well 40.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? [ ] Yes [ ] No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	7.23 ft.	11.32 ft.
Date	12/08/94 m m d d y y	12/08/94 m m d d y y
Time	11:30 [X] a.m. [ ] p.m.	[ ] a.m. 5:30 [X] p.m.
12. Sediment in well bottom	≤ 1.5 inches	inches
13. Water clarity	Clear [ ] 10 Turbid [X] 15 (Describe) light brown to gray brown	Clear [X] 20 Turbid [ ] 25 (Describe) very slightly turbid

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Additional comments on development:

Slow recharge. Purge dry after removing 7-9 gallons.

Well developed by: Person's Name and Firm

Name: ERIC CHUDZIK

Firm: Graef, Anhalt, Schloemer and Associates, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: Graef, Anhalt, Schoemer and Associates, Inc.

Facility/Project Name: JCRGI BENNINGTON, VT

Facility License, Permit or Monitoring Number:

Grid Location: _____ ft. ☐N. ☐S. _____ ft. ☐E. ☐W.

Well Name: MW-7

Wis. Unique Well Number / DNR Well Number:

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location: _____ 1/4 _____ of 1/4 of Section ____, T _____ N, R _____ ☐E ☐W

Date Well Installed: 12 / 08 / 94 (m m / d d / y y)

Well Installed By: (Person's Name and Firm)
SOILS & MATRIALS TESTING
STONEY

Distance Well is From Waste/Source Boundary: 0.0 ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known

A. Protective pipe, top elevation ____ ft. MSL

B. Well casing, top elevation ____ ft. MSL

C. Land surface elevation ____ ft. MSL

D. Surface seal, bottom ____ ft. MSL or ____ ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☐ SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
_____

E. Bentonite seal, top ____ ft. MSL or 0.5 ft.

F. Fine sand, top ____ ft. MSL or ____ ft.

G. Filter pack, top ____ ft. MSL or 1.5 ft.

H. Well screen, top ____ ft. MSL or 2.0 ft.

I. Well screen, bottom ____ ft. MSL or 9.0 ft.

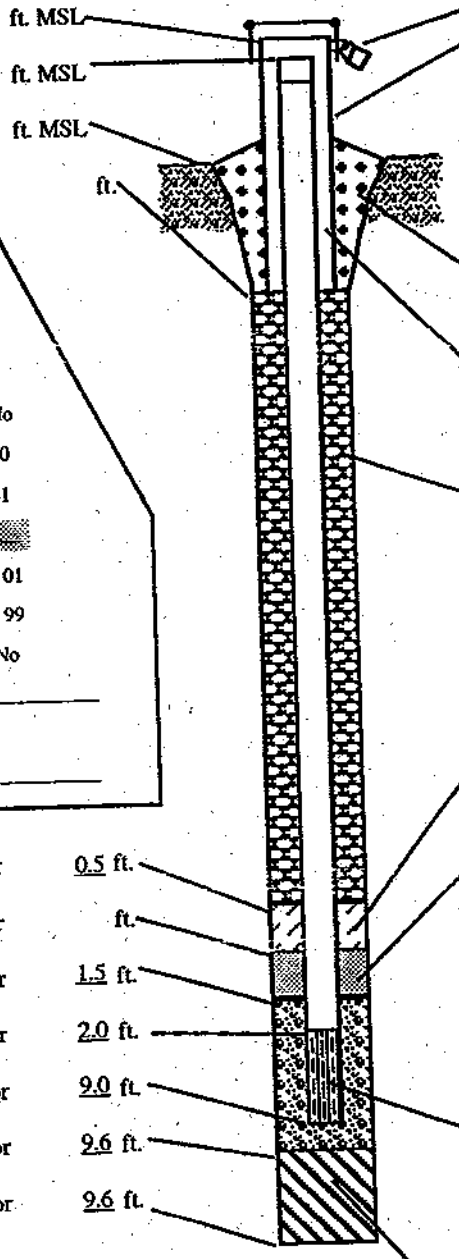
J. Filter pack, bottom ____ ft. MSL or 9.6 ft.

K. Borehole, bottom ____ ft. MSL or 9.6 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.03 in.

N. I. D. well casing 2.36 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length 4.5 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection: ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐; Other ☐ ____

5. Annular space seal: ____ Granular Bentonite ☒ 33; ____ Lbs/gal mud weight..Bentonite sand slurry ☐ 35; ____ Lbs/gal mud weight.....Bentonite slurry ☐ 31; ____ % Bentonite.....Bentonite-cement grout ☐ 50; ____ Ft^3 volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☒ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐
Other ☐ ____

7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added _____ ft^3

8. Filter pack material: Manufacturer, product name and mesh size
30 SIEVE
Volume added 1.9 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____

10. Screen Material: PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
Manufacturer _____
Slot size: 0.010 in.
Slotted length: 7.0 ft.

11. Backfill material (below filter pack): None ☒; Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm GRAEF, ANHALT, SHLOEMER AND ASSOCIATES, INC.

948530.MW-7

Facility /Project	Well Name
JCBGI BENNINGTON, VT	MW-7
License, Permit or Monitoring	Wis. Unique Well Number / DNR Well Number

1. Can this well be purged dry? [X] Yes [ ] No

2. Well development method

surged with bailer and bailed	[X]	41
surged with bailer and pumped	[ ]	61
surged with block and bailed	[ ]	42
surged with block and pumped	[ ]	62
surged with block, bailed and pumped	[ ]	70
compressed air	[ ]	20
bailed only	[ ]	10
pumped only	[ ]	51
pumped slowly	[ ]	50
Other _____	[ ]	

3. Time spent developing well 300 min.

4. Depth of well (from top of casing) 12.0 ft.

5. Inside diameter of well 2.03 in.

6. Volume of water in filter pack and well casing 7.2 gal.

7. Volume of water removed from well 35.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? [ ] Yes [ ] No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	4.81 ft.	4.78 ft.
Date	12/08/94 m m d d y y	12/08/94 m m d d y y
Time	[ ] a.m. 3:30 [X] p.m.	[ ] a.m. 8:30 [X] p.m.
12. Sediment in well bottom	≤ 1.0 inches	≤ 1.0 inches
13. Water clarity	Clear [ ] 10 Turbid [X] 15 (Describe) light brown to gray brown very fine sediment	Clear [X] 20 Turbid [ ] 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	mg/l	mg/l
15. COD	mg/l	mg/l

Additional comments on development:

Slow to very slow recharge. Purge dry after 5-7 gallons.

Well developed by: Person's Name and Firm

Name: _____

Firm: Graef, Anhalt, Schloemer and Associates, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: Graef, Anhalt, Schloemer and Associates, Inc.

APPENDIX D

WILLIAM E.
DAILEY INC.
RR1A - BOX 51
SHAFTSBURY, VERMONT 05262

DATE: 1-9-95

To: MATERIALS DIVISION
From: PLANT Shaftsbury
Source: Pond Fill
Remarks: RSB

Att: Paul Buckley
EWT Co.

END OF ROLL END OF ROLL END OF ROLL END OF ROLL

Pond Fill

SIZE	WEIGHT	% RET	% PASS	WEIGHT	% RET	% PASS	WEIGHT	% RET	%
#50	0		100						
#100	1.5	.4	99.6						
#200	16.8	4.4	95.2						
270	17.5	4.6	90.6						
Pan	345	90.6							
Total	381								

SIZE	WEIGHT	% RET	% PASS	WEIGHT	% RET	% PASS	WEIGHT	% RET	%

TECH DATA SHEET

American Colloid Company
Building Materials Division

1. PRODUCT NAME

VOLTEX™ Geotextile Waterproofing Liner

2. MANUFACTURER

American Colloid Company
Building Materials Division
One North Arlington
1500 West Shure Drive
Arlington Heights, IL 60004
Phone: (708) 392-4600
Fax: (708) 506-6195

3. PRODUCT DESCRIPTION

Basic Use: VOLTEX is a flexible, high strength, sodium bentonite geotextile waterproofing liner.

VOLTEX is designed for waterproofing concrete, especially construction methods such as lagging, sheet piles and caissons. VOLTEX is also suitable for use on foundation walls and below concrete slabs. Each 4' x 10' sheet of VOLTEX is fabricated by distributing Volclay sodium bentonite in a uniform thickness between two layers of polypropylene geotextile. This "sandwich" is then needle-punched American Colloid Company's state of the art equipment, which pushes the fibers from one layer of the geotextile, through the layer of sodium bentonite into the opposite layer of geotextile. The connecting fibers between the two geotextiles essentially encapsulate the bentonite; inhibiting migration of the clay in either the dry or hydrated state. This mechanical bonding of the layers gives VOLTEX unequaled friction characteristics and intergeotextile shear strength. The result is a strong, flexible, uniform, sodium bentonite geotextile liner with the characteristics of a 3 foot layer of compacted (1×10^{-7} cm/sec) clay.

Limitations: VOLTEX should not be applied in standing water. If the soil contains strong acids, alkalies, or brines, water samples should be submitted to the manufacturer for tolerability testing.

Surfaces with gaps in excess of 1-1/2" must be filled and trowelled smooth with grout, cement, or Bentoseal. Applications other than those clearly discussed herein should receive written approval by the manufacturer prior to the issuance of specifications.

Expansion joints are the responsibility of others.

Composition and materials: VOLTEX is manufactured utilizing a chemically treated high swelling Volclay sodium bentonite (also known as Wyoming Bentonite) at a 12% moisture content. The "standard" assembly is 6oz. per square yard nonwoven geotextile, Volclay bentonite, 3.3oz. per square yard woven geotextile, VOLTEX has a bentonite content of 1.2 pounds per square foot.

4. TECHNICAL DATA

Free Swell Rating: Granular bentonite used in VOLTEX meets the following test: 2 grams sifted into deionized water swells to occupy a minimum volume of 16 cc.

Grading: Granular bentonite used in VOLTEX passes 90% through a 20 mesh sieve and less than 10% through a 200 mesh sieve.

Chemical Analysis-Approximate %

Silica	60%
Alumina	20%
Iron Oxides	5%
Magnesia	3%
Soda	3%
Lime	1%
Chemically Bound Water	6%
Minor	1%

Performance Characteristics: VOLTEX Geotextile Waterproofing liner has been tested by independent laboratories, and has a measured permeability of 1×10^{-7} cm/ sec. The mechanical bonding of the geotextile layers give VOLTEX unequaled friction characteristics and intergeotextile shear strength. VOLTEX when applied to manufacturers recommendations is capable of waterproofing over gaps in lagging.

5. INSTALLATION

Preparation: Installation shall not proceed when work areas are flooded or excessively wet to the extent that would cause VOLTEX to hydrate, nor when rain can reasonably be anticipated before VOLTEX can be properly installed. Concrete surfaces shall be free from large voids or projections. Voids, pits, cracks and joints in excess of 3/4" diameter, should be parged to flush

condition using either cement grout or Volclay Bentoseal. Projections greater than 1/2" shall be smoothed flush.

Method: Install VOLTEX in strict accordance with manufacturer's instructions as applicable to project conditions (ie...lagging, sheet piles, caissons, below slab, free standing walls,...) Install VOLTEX with the woven side (black) facing the concrete to be waterproofed. VOLTEX should be installed with a minimum edge lap of 2". A general securement pattern may be established as; along the edges and a few in the center of the section.

Backfill compacted to at least 85%. Modified Proctor shall promptly follow the application of each course to within 2" of the top sheet edge on outside or free standing wall applications. For additional securement and termination guidelines; refer to the manufacturer's specification.

6. AVAILABILITY & COST

Availability: VOLTEX is available throughout the United States, Canada, the Far East, and Europe, through a network of American Colloid Distributors. Contact the manufacturer for the nearest distributors location.

Cost: Applied costs are dependent upon local labor cost, freight rates, job site conditions, etc. Costs are competitive with conventional waterproofing materials.

7. WARRANTY

Information contained herein supersedes all previously printed matter and is subject to change without notice.

All goods sold by Seller are warranted to be free from defects in material and workmanship.

The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise, including but not limited to any implied by operation of law or otherwise, including but not limited to any implied warranties of merchantability or fitness.

Seller shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising from the sale, handling or use of the goods, or from any other cause relating thereto, and Seller's liability hereunder in any case is expressly limited to the replacement (in the form originally shipped) of goods not complying with this agreement or at Seller's election, to the repayment of, or crediting Buyer with, an amount equal to the purchase price of such goods, whether such claims are for breach of warranty or negligence.

Any claim by Buyer with reference to the goods sold hereunder for any cause shall be deemed waived by Buyer unless submitted to Seller in writing within (30) days from the date Buyer discovered or should have discovered, any claimed breach.

Materials should be inspected and tested by purchaser prior to their use if product quality is subject to verification after shipment. Performance guarantees are normally supplied by the applicator. Expansion joints are the responsibility of others.

8. MAINTENANCE

None required.

9. TECHNICAL SERVICES

Complete technical service is available upon request to the manufacturer. These services include water analysis to determine compatibility of conditions below grade, and review of drawings and specifications. Prescribed modifications are recommended when required to accommodate special conditions. The manufacturer and distributors also work with the contractor through the initial stages to assure proper installation procedures. For specialized services, a fee may be negotiated with the contractor.

Contact manufacturer for current data, additional installation instructions, technical information, and comments on design conditions not covered herein.

10. FILING SYSTEMS

Product brochures, specifications sheets and technical information is available from American Colloid Company.

NORTH AMERICAN GREEN

MATERIAL SPECIFICATIONS — CATEGORY I

CELL-O-SEED Seed-incorporated blanket option shall consist of 2-ply 100% recycled, unbleached, cellulose tissue. A *standard seed mix of 66% Kentucky 31 Tall Fescue and 33% Annual Ryegrass at a rate of .05 lbs/y^2 (240 lbs/acre) shall be uniformly distributed upon the bottom ply of cellulose tissue and fully overlaid with a top cellulose ply to provide complete envelopment of the seed layer. The seed-incorporated cellulose medium shall be sewn to the bottom side of the specified erosion control blanket.

Material Content

Top ply	1-ply 100% recycled unbleached cellulose tissue (4.3 lbs/1,000 sq ft)
*Seed	Kentucky 31 Tall Fescue (.033 lbs/y^2 - 160 lbs/acre)
	Annual Ryegrass (.017 lbs/y^2 - 80 lbs/acre)
Bottom ply	1-ply recycled unbleached cellulose tissue (4.3 lbs/1,000 sq ft)

Physical Specifications (Roll)

The seed-incorporated cellulose medium shall conform in length, width, and area to the dimensions of the erosion control blanket specified with the option.

* Shall also be available in customer-specified seed blends.

NORTH AMERICAN GREEN

MATERIAL SPECIFICATIONS — CATEGORY I

S150 Erosion control blanket shall be a machine-produced mat of 100% agricultural straw.

The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with polypropylene netting having an approximate 1/2 inch X 1/2 inch mesh. The blanket shall be sewn together with cotton thread.

Straw erosion control blanket shall be S150 as manufactured by North American Green, or equivalent. The erosion control blanket shall have the following properties:

Material Content

Straw	100% (.5 lb/y^2) (.27 kg/m^2)
Netting	Top and bottom sides lightweight photodegradable (1.64 lb/1,000 sq ft approx wt)
Thread	Cotton

Physical Specifications (Roll)

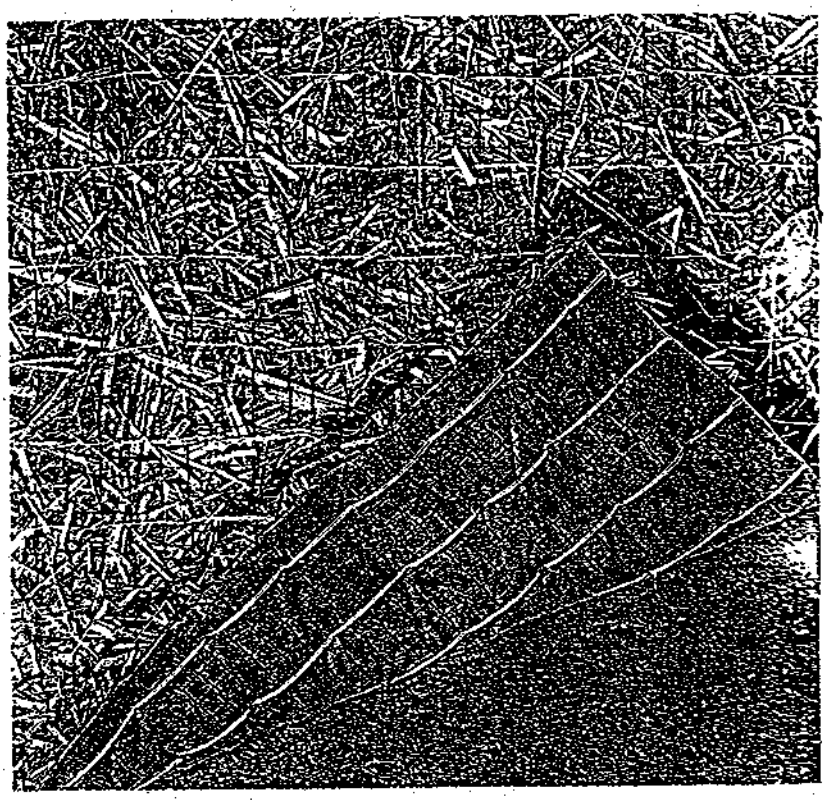
Width	6.5 feet (2m)
Length	83.5 feet (25.4m)
Weight	30 lbs ± 10% (13.6 kg)
Area	60 sq yds (50m^2)

14649 Highway 41 North • Evansville, Indiana 47711 • 812-867-6632

North American Green® Blanket Option

Cell-O-Seed®

North American Green Cell-O-Seed seed-incorporated blankets offer a cost-effective alternative to the conventional two-step seed/ mulch revegetation routine. North American Green Cell-O-Seed is a recycled cellulose fiber growth medium incorporated with standard or customer-specified seed mixes. The Cell-O-Seed process insures seed retention and distribution while providing an optimum germination environment throughout the erosion blanket. Cell-O-Seed is available on North American Green blanket models S150 through C125 for simple, one step application of mulch, erosion control and seed.



Cell-O-Seed Specifications

Material Composition

Tissue . . . recycled cellulose fiber top and bottom

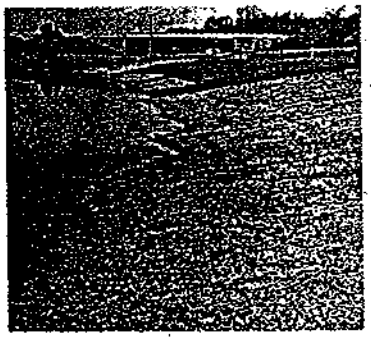
Seed* . . . standard mix
2/3 KY 31 Tall Fescue
1/3 Annual Ryegrass
.05 lbs/sq yd (.027 kg/sq m)

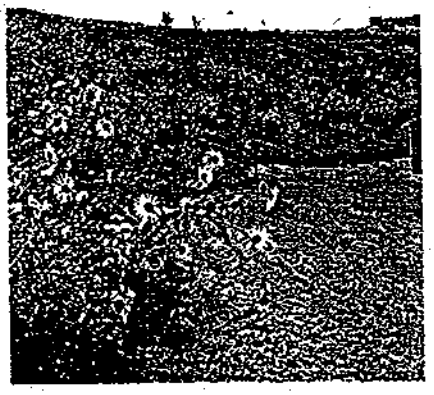
*Contact North American Green for design, pricing, and availability of custom seed blends.

Cell-O-Seed Roll Specifications

Width . . . . 6.5 ft (2 m)
Length . . . 83.5 ft (25.5 m)
Weight . . . 7.7 lbs (3.5kg) with standard seed
Area . . . . . 60 sq yd (51 sq m)

Erosion, wildlife depredation, and poor seed distribution are problems often encountered when revegetating newly constructed wetland shorelines. These problems can virtually be eliminated by using North American Green blankets incorporated with a special wetlands seed blend.





North American Green C125 incorporated with a native grass and wildflower mix provided ideal revegetation for this steep, low maintenance slope around a housing complex.

APPENDIX E

RAIROAD SPUR DRAINAGE DITCH ELEVATION

JOHNSON CONTROLS BATTERY GROUP INC.
BENNINGTON, VT.

Station	RR-1			RR-2 West			RR-2 East			RR-3		
	Initial	Depth of Cut	Final	Initial	Depth of Cut	Final	Initial	Depth of Cut	Final	Initial	Depth of Cut	Final
7+75	609.80	611.18	613.70	609.80	608.28	611.02			610.90			610.82
7+50		610.82	614.10			610.72	609.56	608.20	610.72			610.86
7+25	609.26	609.92	614.08	609.26	607.74	610.68	608.64	608.64	610.68	611.22	610.22	611.90
7+00	609.10	609.60	613.60	609.10	607.10	611.68	609.10	606.84	610.78	612.02	610.60	612.72
6+75		607.40	611.52			610.58	610.82	609.08	611.64	612.74	610.42	613.00
6+50	609.11	607.77	612.70	609.11	607.97	611.92	609.14	607.64	610.50	612.98	611.98	612.82
6+25	612.09	610.81		609.18	608.20		608.90	607.90				
6+00	612.00	610.36	611.86	609.14	607.92	610.50	608.96	607.62	611.98			613.66
5+75	611.32	609.64		609.12	606.56		608.92	606.60				
5+50	611.26	608.16	611.78	609.08	605.80	610.42	608.94	605.78	612.42			
5+25	610.78	607.50		608.98	605.60		608.56	607.28				
5+00	610.58	608.18	611.64	609.18	606.56	610.40	608.96	606.98	611.52			613.44
4+75	611.48	608.25		609.22	606.72		609.16	607.94		612.62	611.24	
4+50	611.32	609.78	611.34	609.18	607.48	609.76	608.70	607.18	610.80	613.06	611.00	613.70
4+25	609.22	607.87		609.08	607.99		608.30	606.68		609.48	611.60	
4+00	609.34	608.08	610.92	609.10	608.08	609.40	607.92	606.86	611.12	611.44	611.56	613.38
3+75	609.20	607.98		609.24	607.90		607.72	606.80		609.48	610.90	
3+50	609.12	607.58	609.52	609.18	607.48	609.32	607.56	606.48	609.88	611.44	609.70	612.38
3+25	608.96	607.02		609.12	607.00		607.38	606.24		609.48	608.70	
3+00	609.36	606.18	610.56	608.98	605.78	609.12	607.86	606.06	608.84	611.44	608.70	610.92
2+75	609.48	606.30		609.16	606.14		608.14	606.22		609.80	608.10	
2+50	611.44	609.86	611.52	609.12	607.28	609.00	607.06	605.98	609.62	608.80	607.74	610.50
2+25	609.68	606.84		607.84	609.87		605.64	607.68				
2+00	610.34	608.24	611.74	609.18	607.10	609.40	608.20	606.24	608.38			609.48
1+75	609.26	606.64		609.26	606.40		608.10	605.68				
1+50	609.26	606.52	610.22	608.90	606.28	609.20	607.88	605.80	607.58			608.54
1+25	609.66	607.24		609.12	607.10		610.86					
1+00	609.40	607.74	609.58	609.04	607.44	608.88	607.57		607.48			
0+75	609.26	607.58		609.04	607.14		607.42	606.30				
0+50	608.78	606.04	609.48	608.40	605.70	608.74	607.70	606.53	607.46			
0+25	607.58	604.44		607.50	604.30		607.00	607.00				
0+00	607.35	604.32	607.90	607.32	605.17	607.80	606.82	606.82	606.70			

PROPANE AREA ELEVATIONS

JOHNSON CONTROLS BATTERY GROUP INC.
BENNINGTON, VT.

Station	Initial	Depth of Cut	Final
01	609.00	610.10	610.34
02	608.94	610.44	610.18
03	608.06	609.02	609.22
04	607.66	604.86	609.12
05	607.22	610.66	609.54
06	604.34	606.84	608.20
07	604.38	607.34	608.10
08	610.64	611.46	611.68
09	611.14	612.18	612.22
10	611.30	612.46	612.56
11	612.40	613.40	613.18
12	611.62	612.68	611.70
13	610.26	608.70	609.96
14	609.12	610.24	608.50
15	609.86	611.32	609.72
16	611.48	612.68	610.84
17	612.56	613.40	611.55
18	612.22	613.14	611.60
19	611.20	612.48	610.72

NORTHEAST STORMWATER DRAINAGE DITCH (ON-SITE) AND DRAINAGE DITCH DD-3 ELEVATIONS

JOHNSON CONTROLS BATTERY GROUP INC. BENNINGTON, VT.

Station	Initial	Depth of Cut	Final
N-0+75 W	606.88	603.78	607.86
N-0+75 E	607.24	603.52	608.64
N-1+00 W	606.72	605.58	607.90
N-1+00 E	606.82	605.20	608.66
N-1+25 W	605.54	603.29	607.32
N-1+25 E	606.90	604.25	608.46
N-1+50 W	605.26	604.73	607.56
N-1+50 E	606.34	604.52	608.20
DD-3,1	604.12	601.01	604.12
DD-3,2	604.00	601.44	604.20
DD-3,3	603.26	600.78	604.18
DD-3,4	603.82	601.41	604.34
DD-3,5	599.76	601.82	604.10
DD-3,6	602.56	601.00	603.98
DD-3,7	603.02	599.86	603.80