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ORIGINAL (Red)

1.0 INTRODUCTION AND PROBLEM STATEMENT

The Environmental Protection Agency (EPA) has requested technical and cost proposals for hazardous waste removal activities at the Van Elswyck Property Site, Huff's Church, Pennsylvania.

The Van Elswyck Property Site was formerly a sand pit which was utilized by local residents for general refuse disposal. The pit was backfilled, regraded and sold to the Van Elswycks during the 1977-1978 interim. It is believed that hazardous wastes were disposed of in the pit during backfilling operations as groundwater sample results at the site reveal high levels of organic contaminants.

The scope of work includes excavation and disposal of an estimated 2,000 cubic yards of contaminated soil. Removal and disposal of approximately 50 drums, and the removal and disposal or treatment of approximately 30,000 gallons of water.

The following sections outline O.H. Materials Co. (OHM) technical proposal for this project.

2.0 TECHNICAL APPROACH

This section details the approach which will be utilized for the removal of the drummed waste and contaminated soil from the Van Elswyck Property site. Included in this section are:

- Site Preparation Detail
- Soil Excavation Procedure
- Drum Handling Procedure
- Liquid Handling Procedure
- Site Regrading Procedure
- Sampling Procedures
- Project Safety
- Analytical
- Project Scheduling
- Personnel and Equipment

2.1 STAGING EQUIPMENT AND SUPPORT FACILITIES

All equipment and support facilities necessary for the effective implementation and completion of the project will be staged prior to drum excavation. The support facilities that will be located at the Van Elswyck Property site which will allow project operations to proceed at a maximum rate are the following:

1. Field Office (Clean Zone)

   This is the communications center for the project for both OHM's personnel as well as the OSC and/or his personnel. The following activities are conducted from the office:

   a. Project billing and report writing
   b. Project purchasing and logistics
   c. Personnel and salary records
   d. Communication system
   e. Supervisory plans for project operation
   f. Arrangements for transportation and disposal

2. Decontamination Trailer (Transition Zone)

   Each decontamination trailer used in the field supports 14 men and their protective equipment. These trailers are designed with private lockers. Each decontamination unit has its own hot and cold water system and contains wash basins and a shower. Decontamination units are equipped with mounted diesel generators to operate lights, pumps, and various electrical needs since electricity is frequently not available in the field.

These units are equipped with a variety of safety equipment, self-contained breathing apparatus, respirators (full and half-face), replacement cartridges and canisters for special atmospheres, protective clothing, chemical and acid suits, sample gloves and sampling equipment, basic hand tools, non-sparking tools, and miscellaneous items.

Depending on the seriousness of the contamination at the site, a decontamination trailer can be the location at which workers enter to remove street clothes and don their protective clothing before going to the contaminated work area, or they can enter the decontamination trailer, remove their street clothes, don coveralls, and then proceed to a tent area (or temporary building) where they dress in other protective clothing. More stringent precautions are taken at more seriously contaminated areas.

The decontamination unit will not only provide maximum safety for employees, but also prevents hazardous chemicals from being carried away from the decontamination project.

3. Cascade Area (tent or temporary building) (Clean Zone)

This is the location where breathing air bottles for the self-contained, 30-minute breathing apparatus and the manifold air systems are filled. Large cylinders of purified air provide the source from which cylinders are filled.

4. Air-Bottle Exchange Area (Transition Zone)

This structure or location is closer to the actual work area since it is more convenient for workers not to have to walk so far every 30 minutes as their breathing apparatus needs to be replaced.

5. Tent Area (can also be a temporary building) (Contaminated Zone)

The "tent" area is where workers clean and store their protective clothing and self-contained breathing apparatus, take breaks between shifts or relief from extreme temperature conditions; drinks of water are offered by a tent assistant who helps workers to avoid contaminating the water or tent area. Disposable gloves and boots are available. The tent assistant maintains stocks of the proper items, helps personnel with their protective clothing and breathing apparatus, and makes certain that personnel take adequate breaks. (See Project Safety) Protective clothing and equipment are inspected and cleaned at this area.

6. Work Area (Contaminated Zone)

Although the work area is not a "Support Operation" of the project, it should be mentioned that this is the area to which most attention is given regarding safety since it is the source of contamination. Workers are assigned to a foreman in small groups of five or less; they are not allowed to leave their group and undertake any activity unaccompanied by other workers. When workers leave the contaminated area, they are allowed to go to the bottle exchange area for refills, or if they plan to leave the site, they must first return to the tent area, remove protective clothing, and then proceed back to the decontamination area.

2.1.1 Site Preparation

A diked storage/solidification area will be constructed on site. This storage/solidification basin will be appropriately lined with polyethylene sheeting. On top of the lining will be approximately one foot of clay type compacted soil to allow heavy equipment entrance and egress. The basin will be constructed in a ramp-like fashion to allow heavy equipment to enter the basin.

Loading of trucks with drums and solidified material will occur directly adjacent to the storage/solidification basin. Therefore, loading ease and truck access will be the prime consideration in construction, locating, and placing the storage/solidification area.

The existing on-site drainage provisions will be accessed as their effectiveness and applicability to cleanup operations. Specific areas of concern for site drainage during cleanup are:

1. Divert all surface waters up gradient from the site away from the site. This will be accomplished primarily by diking.
2. Divert all surface waters away from the solidification area through diking and diversion ditches.

2.1.2 Excavation of the Area

Following site preparation, the area will be excavated. Excavation will proceed from the southwest corner of the drum-filled area and proceed to the northeast corner closest to the house. A front-end track loader will be used to remove fill and debris from the cutwall of the fill area. One loader will be dedicated to the removal of overburden from the cutwall.

The initial removal will be performed in 5' increments with contaminated soil being staged near the solidification basin and clean soil placed on the southeast edge of the excavation for reuse as fill and grade material. The 5' lifts will be repeated until an area is determined drum/contaminated soil free.

After the front-end loader has removed a loaded bucket, the loader will turn and deposit the soil adjacent to their working area if uncontaminated or in the contaminated soil staging area.

When drum(s) are encountered during excavation, a drum grappler will be used to extract the drum(s) from the excavation. The drums will then be immediately overpacked. The 215 will transport the removed overpacked drums to the staging areas. While drums are being removed from an area of the cutwall, the loaders will continue excavating in another area of the fill.

Soil and debris that are determined by the OSC to be contaminated will be stockpiled near the staging/solidification area on the project site. This material will be used for solidifying wastes and will be loaded into bulk-lined trucks for disposal at an approved facility.

As the excavation approaches the house, the following guidelines will be used. A minimum 45% slope will be maintained from the point where the ground surface meets the house to the bottom of the excavation. If there is evidence of contamination that would necessitate excavating closer to the house, alternative support measures will be taken such as piling, etc.

During and after the excavation, the removed soil will be graded with the 955's to prevent erosion of the fill. Additional fill and top soil materials will be acquired.

2.1.3 Drum Handling

There is no one uniform condition in which drums will be found at a hazardous waste site. The drums may be stacked in orderly rows, or piled upon each other in complete disarray. There is no safe way for personnel to move drums manually in these situations. Consequently, OHM utilizes a drum grappler that can move drums quickly, with safety as a prerequisite.

To protect the driver from splashing chemicals, or explosion, a special windshield is used which consists of a clear, outer 1/4" plexiglas shield. This shield is permanently attached to the driver's enclosure. An independent manifold breathing air apparatus is utilized for the operator's respiratory protection.

After the grappler has pulled a drum from its original position, the drum is inspected for leaks, contents, and identifying markings. The drum will then be placed in an available overpack, a number of which will be staged nearby for this purpose.

The on-site decontamination technician records the number of drums moved from the stack of drums each day, the size of the containers (85-gallon overpacks, 55-gallon drums, etc.), the condition of the containers (full, empty, liquid, solid), and any identifying markings (generator's markings, lot number, etc.). This information is logged in a bound ledger which is maintained in the on-site OHM field office. Pictures can also be taken of the drums with identifying markings and kept in a bound ledger.

The initial operation of handling drums as they are recovered from the site is one of the most dangerous operations during a cleanup project at a waste site. A drum might be filled with an inert polymer or with shock sensitive explosives. A drum grappler is built to withstand most potential hazards which provides a marked improvement in safety over the manual method of moving drums.

The person using a drum grappler to handle potentially dangerous drums has the advantage of:

1. being a greater distance away from from the drums, and

2. being protected by two protective shields over the front part of the cab of the grappler.

2.1.3.1 Technique for Handling Drummed Hazardous Wastes

The basic steps involved in removing drums from the Van Elswyck Property Site hazardous waste site can be summarized as a procedure consisting of the following:

1. The drums are removed by a drum grappler; the drums are then set up in rows. The use of the grappler rather than manual labor provides a much faster and safer handling of drums.

2. A front-end loader is used to pick up these drums and take them to the diked staging area. Here the drums are placed in orderly rows. The drums are opened by means of a non-sparking brass tool.

3. Sampling is performed by a team consisting of the technical foreman and two support personnel. The team uses protective clothing and self-contained breathing apparatus during the sampling period. The samples are then transferred to the laboratory for analysis.

4. Following analysis the drums are properly manifested and prepared for shipment to the selected disposal facility.

2.1.4 Handling Contaminated Water

Contaminated water that collects in the excavation will be pumped into a 50,000 gallon pool for storage while analysis is performed and the appropriate disposal/treatment option is determined.

2.1.5 Sampling Procedures

2.1.5.1 Sampling of Drums

After being transferred to the staging area, the drums are ready for sampling. Each drum will be opened using a brass non-sparking tool. The top of the drum will be punctured if building and personnel will assume a safe position in the event of a reaction.

Liquid Waste Drums

A team of technicians will don protective gear necessary for safety and begin sampling the drums. The sampling process consists of the following steps for liquid drums:

1. A clean glass tube is inserted into the opening made in the drum.

2. The liquid in the tube represents a core of a drum contents.

3. The liquid is transferred to an appropriate container and labeled with the corresponding drum number.

4. Each drum has a data sheet regarding pertinent information needed (see attachment).

5. A Chain-of-Custody (see attachment) is completed and samples are sent to the laboratory for analysis.

6. All drums are covered with a polyethylene cover following sampling and the overpack lid put in place.

Solid Waste Drum Sampling

Powdered, granulated and sludge materials will be regarded as solids and be staged as such. The sampling process consists of the following steps for solid drums.

1. A clean trowel or sample trier will be inserted into solid material and an aliquot removed.

2. The material is transferred to an appropriate container and labeled with the corresponding drum number.

3. A data sheet is completed regarding pertinent information (see attachment).

4. A Chain-of-Custody form (see attachment) is completed and the samples are sent to the laboratory for analysis.

2.1.5.2 Sampling of Contaminated Soils

As an added precaution after removal of the drums, contaminated soils in the immediate area are removed and transferred to a storage area and spread out to promote volatilization of organic constituents. The soil will be sampled to determine the extent of contamination, if any. A program utilizing composite samples will be used to ensure the sample is representative. A sampling grid will be established over the storage area and sub-samples of a wide area will be composited into one sample per depth. Analysis of these samples will elicit information regarding contamination of the soil for disposal purposes.

2.1.5.3 Sampling of Contaminated H^2O

Water removed from the excavation area and collected in the 50,000 gallon storage pool will be sampled on a regular schedule. Grab samples will be taken from the pump effluent and composted to provide representative samples of the contaminated water for analysis.

2.2 ANALYTICAL

OHM, as designated by the OSC or designate, is providing all necessary sampling and analytical work for characterization of wastes in order to overpack/bulk, transport, and dispose of the waste materials. As part of the sampling program, volumes and other characteristics of containers, liquids, and soils will be noted and a master site map developed.

The results of the sampling and analytical program will be used by the OHM site supervisor to develop priority recommendations for removal activities. The recommendations will be reviewed with the OSC for his approval prior to commencement of removal operations.

2.2.1 Sampling Methodology

Sample acquisition from the site will follow USEPA sampling protocol. Quality assurance/quality control will follow OHM QA/QC standard procedures as outlined in Appendix C. Safety procedures will be adhered to as outlined in Section 2.4.

If standing water or liquids are encountered on the site such as diked areas, sumps, etc., a sample will be taken of the liquid on top and any solid residues or soils below. The liquid samples will be taken using a lab line sampler if the body of water is of considerable size. A grab sample will be taken of smaller areas. Surface soil samples will be taken using a "trowel". Larger soil piles will be sampled with a trier sampler.

For analysis of volatile halogenated compounds, sample containers will have a minimum 40 ml capacity with a screw-on cap and a teflon-faced silicone septum. The containers will be washed, rinsed, and dried before use. The sample will be sealed allowing no air space, and will remain sealed until the time of analysis.

One quart glass sample containers will be used to obtain samples for PCB and metals analyses. The containers will be washed, solvent rinsed, and dried before use. Caps will be of the screw-on type and will be lined with teflon tape. Aluminum foil is an acceptable substitute for teflon tape if the sample is not corrosive. All samples will be iced or refrigerated until they are extracted for analysis.

All reusable (non-expendable) sample equipment will be washed and/or solvent rinsed between samples. At all times samplers will don clean sample gloves when obtaining the sample.

Sample labels, which include location, time, date, and samplers' initials, are applied to the containers immediately after taking the sample. A field logbook will be kept by the samplers. Information in this book will include specific location of samples, samplers' initials, as well as additional information pertaining to the material being sampled and the sample itself. This book will accompany the samples to the field analytical unit where the samples will be relinquished by the samplers to the chemists performing the analyses. A statement acknowledging the transfer of samples between the two parties will be entered in the field logbook and signed by both individuals. A sample logbook will be kept in the laboratory which will include pertinent sample information and the analyst's signature, thus completing the chain-of-custody from sample acquisition until final analysis.

The USEPA analytical protocols will be followed on all analyses except those not covered by the EPA procedures. The analyses not covered by USEPA protocols will be performed in accordance with ASTM or NIOSH methods. The basic analysis programs proposed by OHM are: tank inventory analyses; disposal analyses; discharge criteria analyses: EP TOX Extraction and Analyses (solids in tanks); swab tests on tank surfaces after decontamination. In-depth descriptions of these programs are outlined in this Section.

2.2.2 Analytical

All soils, sludges, and liquid wastes are analyzed for compatability prior to bulking and disposal. The parameters selected are those indicated by the OSC or designate. At minimum, the wastes are characterized as organic or inorganic liquids, solids, or sludges. Additional parameters, as listed in Section 2.2.2.1, are performed as directed by the OSC.

2.2.2.1 Analytical Procedures

This section contains a listing of analytical methods considered for characterization of liquid and solid wastes at the Van Elswyck Property site. The appropriate standard references are also presented.

2.2.2.1.1 Liquid Wastes (composite multiple samples to form a representative waste stream)

1. Standard Methods for the Examination of Water and Wastewater, 14th ed., 1975

   - Total Cyanides
     - Distillation, Method 413B
     - Colorimetric, Method 413D

- Phosphates (as applicable)
  - Acid Digestion, Method 425C
  - Colorimetric, Method 425D
- Ash Content, Method 208E
- Total Suspended Solids, Method 208C
- Total Dissolved Solids, Method 208A
- Specific Gravity, Method 210

2. EPA 600/4-79-020 - Methods for Analysis of Water and Wastes
   - Total Phenols, Method 420.3
   - Total Kjeldahl Nitrogen (Organic N and Ammonia), Method 351.3
   - pH, Method 150.1
3. Annual ASTM Standards, 1981
   - Special Pesticide Analysis (Tentative), Method D-76T
     - Prometon
     - Atrazine
   - Heat Content, Method D2015-77
   - Sulfur Content, Method D129-64
   - Halogen Content, Method D808-63
4. EPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846
   - Special Pesticide Analysis, Method 8140
     - Chlorpyrifos
     - Disulfoton
     - Ethoprop
     - Phorate
   - RCRA Metals (analyzed directly; includes Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver)
   - Flash Point

2.2.2.1.2

Solid Wastes (composite multiple samples to form a representative waste stream)

1. Standard Methods for the Examination of Water and Wastewater, 14th ed., 1975

   - Total Cyanides
     - Distillation, Method 413B
     - Colorimetric, Method 413D
   - Phosphates
     - Acid Digestion, Method 425C
     - Colorimetric, Method 425D
   - Solids Contents, Method 208A

2. EPA 600/4-790-020 - Methods for Analysis of Water and Wastes

   - Total Phenols, Method 420.3
   - Total Kjeldahl Nitrogen (Organic N and Ammonia), Method 351.3
   - pH, Method 150.1

3. Annual ASTM Standards, 1981

   - Special Pesticide Analysis (Tentative), Method D-76T
     - Prometon
     - Atrazine
   - EP Toxicity Analysis of the Leachate
     - Endrin, Lindane, Methoxychlor, Toxaphene, Method D3086-72T
     - 2,4-D and 2,4,5-TP, Method 3478-79

4. EPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846

   - Special Pesticide Analysis, Method 8140
     - Chlorpyrifos
     - Disulfoton
     - Ethoprop
     - Phorate
   - EP Toxicity Extraction of the Leachate
     - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Endrin, Lindane, Methoxychlor, Toxaphene, 2,4-D and 2,4,5-TP, Method 1310

- EP Toxicity Analysis of the Leachate
  - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
- Flash Point, Method 1020

2.2.2.2 Record Keeping and Labeling

OHM will maintain careful and complete chain-of-custody reports for sampling and analytical activities associated with the Van Elswyck property. Analytical data is thoroughly documented and copies are regularly submitted to the OSC.

All drums/waste containers and bulk containers are clearly marked as to contents. Careful records of container contents, location, and disposition are also kept.

2.3 Project Schedule

The project schedule is graphically presented in Figure 2.S-1. The tasks indicated in this figure include the following:

- Mobilization
- Site Set Up
- Removal Operations
- Transportation and Disposal
- Sampling and Analytical
- Teardown
- Site Restoration
- Demobilization

The work schedule for the project is seven days per week, ten hours per day. The project is scheduled for completion within thirty days of arrival of the necessary personnel and equipment at the site.

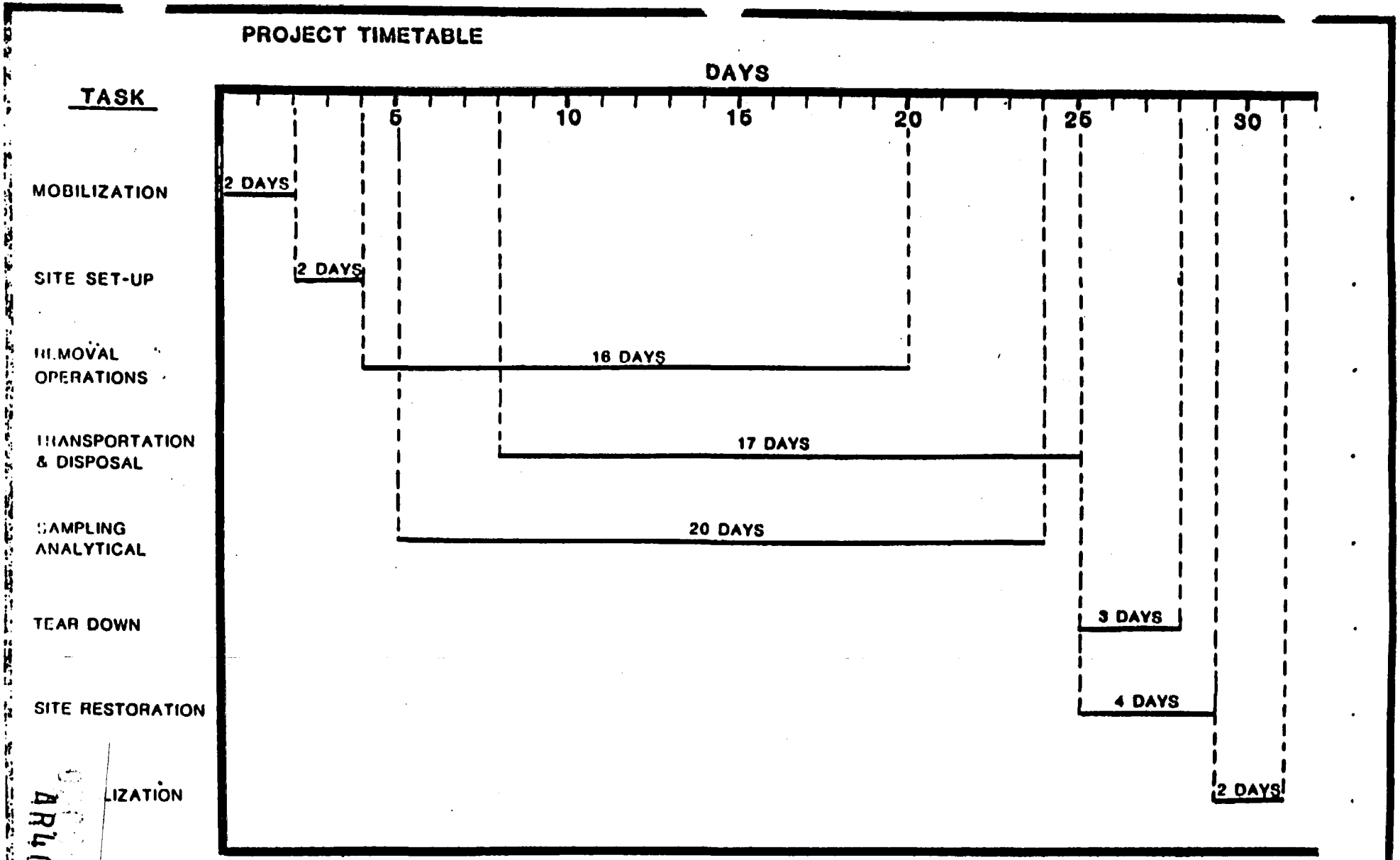

FIGURE 2-S-1

SCALE: NONE	DRAWN BY: C. MERRIN	NO.	DATE	REVISION	BY	PROJECT TIMETABLE	O. H. MATERIALS CO. EMERGENCY RESPONSE AND ENVIRONMENTAL RESTORATION
ATL 6/8/83	CHECKED						
SHEET__OF__	APPROVED						PROJECT / DRAWING / SION

2.4 PROJECT SAFETY AND EMERGENCY PREPAREDNESS

OHM has read and understands the Site Safety Protocal for the Van Elswyck Property Site. The plan will be fully implemented and complied with. The additional project safety policy will be implemented at the Van Elswyck Site as described below. A copy of OHM's Standard Safety Program is presented in Appendix A.

A defined project site layout is paramount to the safe completion of all hazardous waste site cleanups. The project site layout has built-in safety features. The site is divided into three zones.

Personnel performing the following job functions will utilize the designated protective equipment:

Soil removal operation

1. Manifold breathing apparatus
2. Tyvek suits
3. Sample gloves
4. Eye/ear protection
5. Vinyl booties

Sampling

1. Positive pressure SCBA (MSHA/NIOSH approved) operated on the positive pressure mode
2. Syranex or Tyvek suits
3. Sample gloves
4. Hard hat
5. Boots - chemical resistant w/steel toe and shank

Loading/Unloading of Trucks

1. Half-face respirator
2. Tyvek suits
3. Boots
4. Gloves

Truck Decontamination

1. Full-face respirator
2. Splash suite
3. Boots
4. Gloves
5. Hard hat

Administrative & Visiting Personnel

1. Half-face respirator
2. Tyvek suit

More stringent protective equipment requirements will be implemented if determined necessary. This determination will be made by the OHM project supervisor after review of the materials to be handled, the ambient monitoring data, and consultation with on-site OHM technical personnel, OSC and the proper OHM corporate personnel.

In responding to an incident where the type(s) and concentration(s) in the ambient atmosphere of substances injurious to human health are unknown, a determination must first be made if it is necessary to have personnel enter the site (close proximity to the potential source of exposure). A requirement for on-site operations, necessitates personnel to initially enter the site to characterize and define the hazardous environment that potentially exists.

The lack of knowledge concerning the toxic atmosphere that could be encountered precludes the use of a decision logic for selecting respiratory protection equipment based on evaluating concentrations of known toxicants against safety factors associated with various types of personnel protective equipment. Until qualitative and quantitative information is available for assessing the ambient atmosphere at a site, levels of protection based on gross measurements from portable instruments for organic vapor analysis (photoionizer, organic miran vapor analyzer) may have to be used.

If carcinogens or other highly toxic materials are suspected to be present, levels of protection should be determined on a case-by-case basis.

The OHM Corporate Health and Safety Officer has been consulted on appropriate filters and cartridges to use in respirators, types of clothing that will best protect the workers, and any other aspect of safety related to the dangers of the chemicals being dealt with.

Zones are assigned to areas of varying readings. Zones A, B, and C are described by the following information:

Zone A - Total Vapor Readings: 500 ppm to 1000 ppm

Definition

That section of the site which has the highest inhalation exposure potential and/or contains suspected high probability of skin contact with cutaneous or percutaneous effecting chemicals.

Protection Level

Since the area requires maximum respiratory, skin, and eye protection, this area requires Level A personnel protection equipment. (See the personnel section under Safety for description of the different types of levels and the recommended protective equipment.)

Monitoring Criteria

Note wind direction and atmospheric conditions before taking environmental background readings. The zone's total vapor concentrations at breathing levels vary above background from 500 ppm to 1,000 ppm.

The entry team should not routinely enter an area containing total vapor concentrations over 1,000 ppm. Although the protective equipment required for this area is sufficient to go into environments with total vapor concentrations greater than 1000 ppm, the entry team should evaluate the need for further entry on a case-by-case basis.

Zone B - Total Vapor Readings: 5 ppm to 500 ppm

Definition

That section of the site which has the next highest respiratory hazard and does not have a high probability of skin contact with cutaneous or percutaneous affecting chemicals.

Protection Level

Since the area requires maximum respiratory protection and the next lower level of skin and eye protection, this area requires Level B personnel protection.

Monitoring Criteria

Note wind direction and atmospheric condition before taking environmental background readings. The zone's total vapor concentrations at breathing levels vary above background from 5 ppm to 500 ppm.

Level B is for those areas where the potential exposure to the small unprotected areas of the body is not likely to be harmful upon skin contact.

Zone C - Total Vapor Readings: Background to 5 ppm

Definition

That section of the site where exposure potential is assumed relatively unlikely, however, low levels of respiratory exposure are possible.

Protection Level

Since the exposure potential, concentration, and/or route(s) of contamination are assumed not to be greater than the protection factor associated with a full-face air-purifying respirator, this area requires Level C personnel protection.

Monitoring Criteria

Note wind direction and atmospheric condition before taking environmental background readings. The zone's total vapor concentrations at breathing levels vary above background to 5 ppm.

More stringent protective equipment requirements will be implemented if determined necessary. This determination will be made by the OHM project supervisor after review of the materials to be handled, the ambient monitoring data, and consultation with on site technical personnel, and the Project Industrial Hygienist.

Requirements for respiratory protection are:

1. In all cases, when protective respirator equipment is used, every respirator type is fit tested to the individual using it. Fit tests are made using irritant smoke. All field personnel are trained in the use of different respirator types and the limitations of those respirators.

2. In work site areas where the respirator wearer may be overcome by toxic vapors, there are several personnel available to initiate a rescue operation. There is also at least one man always within the visual, auditory, or signal communication line of the respirator wearer.

3. Employees using air supplied manifold respirators are always equipped with a five-minute Scott escape pack and a safety harness/life line.

4. Supervisory personnel maintain frequent on-site inspections of respiratory protection gear for cleanliness, function, and repairs (if needed). They also check to be sure that respiratory equipment is properly stored.

5. Supervisors conduct periodic procedural training sessions, on site, for personnel so that they are familiar with the proper use, care, and maintenance of all types of respirators being used.

6. All employees wearing respirators are required to be clean shaven to help ensure proper respirator fit.

Basic air monitoring and general site characteristics are the governing factors for determining the range of specific boundary perimeters. Extensive testing in the field contributes to the final classification of the boundary type and size. Physical field testing consists of the following:

1. Explosive concentration of gases,

2. Detection, analysis, and concentration of toxic gases, and

3. Adequate oxygen in the atmosphere.

These criteria are defined as follows:

1. Vapor Explosiveness

If a vapor concentration is greater than 20 percent of the lower explosive limit, a careful study is made of the area at ground, waist, and head levels. If the vapor concentration is greater than 50 percent of the lower explosive limit, there is immediate withdrawal of the work party.

2. Toxic Gases

The analyses to determine the concentration of any toxic vapors or gases present will be done by accepted EPA or NIOSH criteria methods. Upon detection of any significant rate, appropriate respiratory and/or personnel protective equipment will be used as prescribed by the project site supervisor.

3. Oxygen Level in the Area

If the oxygen level in the area is less than 19.5 percent, the self-contained breathing apparatus or air supplied manifold respirators will be used and a special marking made to designate the precise area.

Upon receiving an unsatisfactory air quality reading from an instrument, the supervisor will notify the foreman in the immediate area. The foreman will have the area evacuated. The supervisor and field chemist (suitably equipped in safety gear) will use a portable monitoring device to find the contributing source. Once the source is located, the field chemist and the supervisor will take the necessary steps to contain and isolate the problem.

Heavy equipment utilized for the Van Elswyck property project will be equipped with audible warning and roll-over protection system (ROPS). OHM's operators are experienced in hazardous waste site excavation procedures and safety. Each piece of heavy equipment has been adapted with protective shields as well as air bottles with an independent manifold breathing system that the operator can utilize.

OHM demands from its employees safe work practices and daily maintenance of safety equipment. Protective clothing is cleaned at the end of each workday. Each self-contained breathing apparatus (SCBA) and respirator are disassembled, cleaned, inspected, and properly stored each day. Supervisory personnel also do periodic inspections of equipment in addition to the daily procedures required of workers.

At the beginning of every workday, a safety meeting is held. The plan for the day is disclosed as clearly as can be determined and the appropriate safety measures related to those activities are explained. All operations are closely supervised for proper safety practices.

Safety equipment such as first-aid kits, emergency eye showers, and emergency oxygen inhalation systems will be placed at strategic locations of the project site so they are quickly accessible for any emergency situation.

Entrance to the Van Elswyck property site will be limited and site security will be maintained. A logbook of personnel entering the site will be kept. Information in this logbook will include: name, organization represented, date, time of entering and departing site, and other information as required by the OSC. No unauthorized person will be allowed to enter the site without the OSC's approval.

OHM has contingency plans for the following emergencies.

1. Fires

   a. A minimum of five, twenty-pound (dry powder and foam) fire extinguishers will be maintained on site.

   b. Radio and/or telephone numbers will be maintained on site for the local fire department.

   c. Access routes for emergency vehicles are maintained throughout the duration of the project.

   d. OHM's supervisory personnel, after consulting with local law enforcement and fire officials, develop a site evacuation plan, in case of serious fire.

2. Toxic Vapor Release (Major)

Upon receiving an unsatisfactory air quality reading room an instrument, the supervisor will notify the foreman in the immediate area. The foreman will have the area evacuated. The supervisor and technical foreman (suitably equipped in safety gear) will use a portable monitoring device to find the contributing source. Once the source is located, the technical foreman and the supervisor will take the necessary steps to contain and isolate the problem.

3. Medical Emergencies

   a. Personnel from local medical facilities will be briefed on the nature of the project so they can make preparations for medical emergencies.

   b. Supervisory personnel from OHM have first-aid instructor's training; first-aid kits will be available at the facility along with emergency oxygen inhalation systems and emergency eye showers.

   c. Safety is stressed. OHM's personnel are trained in safe work procedures; safe work practices are insisted upon by Company supervisory personnel. Work practices of OHM have been inspected and approved by OSHA.

4. Liquid/Solid Waste Spills

a. Equipment will be maintained on site to clean up spilled materials. Heavy construction equipment such as front-end loaders and backhoes can easily pick up spilled solids and properly dispose of them. Sorbent materials will be maintained on site to absorb the contents of any liquid spilled.

b. OHM's personnel are highly trained in spill control and prevention methods.

c. OHM's method of handling materials mechanically minimizes spillage.

EMERGENCY PROCEDURES PLANNING

An integral part of any project OHM undertakes are the emergency procedures for the safety of all personnel involved in the project and contingency planning for the community in the vicinity. Personnel safety is of primary importance at all times during the project so that both active and passive measures are implemented. Active safety measures are outlined in the project safety section. Passive considerations, relating to contingency actions, are outlined before the start of the project.

A. Site Security

Site-specific security measures include 24-hour surveillance, controlled vehicular access, posted warning signs, and interface with the local police authority.

B. Site Preparation

1. Internal Communication Network

The use of two-way radio communication is standard OHM procedure, as is the line of sight spotting system. Personnel are trained in sign language to communicate with equipment operators and, when necessary, among themselves. Warning devices, i.e. portable non-arcing flashers and sirens, are distributed in hazardous areas to alert all personnel of emergency needs.

2. External Communication Network

The installation of local phone service at the project site is another OHM standard procedure. Emergency service numbers are posted at all telephone locations.

3. Hazard Identification

All areas of the site exhibiting an inherently hazardous characteristic are identified and placarded. Chemical and physical accidents that could lead to work injury are theorized so that preventative measures can be taken.

4. Emergency Medical Equipment

Essential first-aid equipment, including oxygen, showers and eye wash fountains, splints, bandages, stretchers, etc., are located at key points within and around the site. Personnel have constant access to first-aid supplies. The communications system is designed to alert local ambulance units immediately in the case of need.

5. Spill Control Equipment

OHM supplies a full complement of spill control equipment to the site. In addition to portable materials such as boom and absorbent pads, personnel are trained to effectively utilize heavy equipment to control spills.

6. Fire Control Equipment

All areas and operations that are identified as flammable hazards are provided with the proper type and amount of extinguishing agent. Personnel are trained to use all available site equipment to combat a fire.

C. Preventative Actions

1. Personnel Awareness Program

Safety training is a continual effort at OHM. Employees are trained to recognize safety hazards and alert the proper site personnel to potential injury situations. Personal and group safety is stressed.

2. Daily Safety Briefings

Prior to commencing any operation, the hazards associated with the day's activities are made clear. Preventative measures are reviewed and emergency procedures established. Routine safety precautions are reviewed.

3. Specialized Equipment

Specialized equipment includes self-contained breathing apparatus, chemical resistant splash suits, non-sparking tools, eye and fire protection, modified heavy equipment, portable analytical instruments and more.

4. Site Layout Planning

The site is physically divided into a support area, contamination reduction area, and exclusion area. Personnel in the exclusion area are constantly supervised and monitored. The site is accessible at all times for emergency equipment.

D. Inspection Program

Drums and other waste containers are inspected at least daily to evaluate their integrity. Deteriorating drums are placed in overpacks. Waste piles are tested daily for reactivity. Surface impoundments are monitored to keep the required freeboard.

E. Decontamination Schedule

Upon project completion, the site will be decontaminated to the degree set forth by the project manager. All vehicles and personnel will be decontaminated prior to leaving the site.

Local Authority Awareness

All pertinent local authorities are contacted and confidentially briefed by the OSC concerning the nature of the project with respect to their possible involvement.

Emergency Coordinators

A particular concern is the advance identification of emergency coordinators. Individuals with appropriate authority are distinguished before the start of the project and information is available on site.

Evacuation Plan

In case of an emergency, an evacuation plan is prepared for both site personnel and the local community. The plan designates site exit points and local escape routes. The community evacuation plan identifies areas to be evacuated and designates relocation centers. It also makes provisions for relocated residents and determines resettling criteria.

In an evacuation scenario, traffic rerouting is a likely necessity, therefore, the plan maps alternate routes for thru traffic.

List of Emergency Equipment

A. Medical

1. Emergency showers
2. Eye wash stations

3. Oxygen delivery systems
4. Splints, slings, stretchers, bandages, and disinfectants

B. Spill Control Equipment

1. Vacuum skit units
2. Boom
3. Absorbent pads
4. Pumps
5. Heavy equipment and miscellaneous tools

C. Fire Control Equipment

1. ABC type extinguishers
2. Heavy equipment

D. Escape Equipment

1. SCBA
2. Fully-contained suits
3. Chemical suits
4. Respirators, eye protection, etc.
5. Emergency escape air packs

When awarded the contract, OHM will follow this outline, in cooperation with the project manager, to establish communication with authorities, evaluate site developments, and strategically place emergency equipment. Additionally, and developed site and off-site contingency plans called for and approved will be strictly followed.

In addition to selecting the appropriate safety equipment, OHM adheres to a standard safety program (Appendix A) which is patterned after those detailed in:

-"Hazardous Materials Response Manual", U.S. Coast Guard Draft Document 26 May 1982, LCDR T. W. Josiah, Chief, Environmental Coordination Branch, Washington, DC.

-"Interim Standard Operating Safety Procedures", USEPA, Draft Document April, 1981, Emergency Response Division, Washington, DC.

2.4.2 Spill Prevention Control and Countermeasure Plan

Approximately 100-120 drums and an additional 2,000 cubic yards of contaminated soil require excavation and removal. The contaminants can be described generically as halogenated and non-halogenated organics and pesticides. The intent of this plan is to mitigate spillage and prevent off-site migration of contaminants during the excavation and removal process.

OHM has responded to over a thousand chemical spill situations. A key benefit of using OHM for work of any type is that the combined experience from years of spill response is applied to any given job. For the task at hand, OHM will utilize the most effective combinations of planning, machinery, safety equipment, and personnel to preclude spillage and contamination. However, in the event of an incident, cleanup and restoration will be accomplished immediately and expertly.

A major area to be addressed at the Van Elswyck property site is rainfall and surface drainage. Judicious use of traditional control measures will be essential to avoid an unmanageable working area. To this end, a dike will be constructed to divert runoff drainage across the site. Additional diking will be necessary to divert water from the working area. The dike will have the following characteristics:

1. It will be approximately two feet high and moderately compacted.

2. It will be of sufficient length to divert drainage clear of all operational zones, including loading.

Other likely sources of spillage and contamination are the various operational phase of the cleanup. These include:

1. Excavation; this activity will likely unearth wet soils and drums in such poor condition that spillage is unavoidable. Careful handling of drummed wastes will be stressed. Personnel safety as well as minimal spillage will be well served by excavating into the drum area and extracting drums with a drum grappler. Drums of liquid which are of questionable integrity will be overpacked before being removed from the excavation area. At any time during operation when liquids begin to pool in the excavation, grading and trenching will be done to drain the area. Also a skid-mounted vacuum unit will be maintained on site for collected of leachate and spilled liquid. Heavy equipment will be immediately available in the excavation to assist in immediate cleanup of spillage. Sorbent material shall be maintained on site for liquid spillage cleanup.

2. Soil solidification; this area will be diked and isolated near the working face of the excavation. Heavy equipment will be maintained on site for cleanup of spillage of soil.

3. Drum staging; this area will be lined and diked, but located away from the excavation, near the loading zone. Drainage from this area will be routed directly to a catch basin. Drums of questionable integrity will be overpacked for storage in this area. This will be accomplished by the drum grappler and backhoe.

Transportation away from the site to an approved disposal facility will take place by truck. In order to truck the solid material, 20 yd3 containers will be sprayed with a foam sealant and tarped. Placards will be placed in conformance with DOT regulations. Trucks will be decontaminated prior to leaving the site. Liquid material will be shipped via drum or by bulk with the same precautions taken where appropriate,

Spillage could occur on site during the loading phase. This event would not likely require more than the dispatch of the appropriate machinery to recover the material and replace it in the contaminated zone. However, in the case of a serious spill of a chemical substance that might possibly end off the environment and cause a local health hazard, all normal operations will cease and the full complement of machinery, equipment and personnel will be dispatched to the spill area.

Equipment that will be on site and available for use in the event of a spill includes:

1. backhoe
2. front loader (tracked)
3. vacuum skid unit
4. pollution control truck equipped with boom, absorbent pads, generator, light plant, and miscellaneous tools
5. personnel and safety equipment

In transit, spills can occur in the truck mode. In the event of a transportation accident involving waste from the Van Elswyck Property project, the driver will be required to immediately notify the project site. The manifest and bill of lading will also state the project site phone number and require immediate notification.

Upon notification, equipment necessary to contain and clean up the spill will be dispatched from the nearest response facility. For the Van Elswyck Property project, the following response centers shall be utilized:

1. Project Site (O.H. Materials Co.)
2. O.H. Materials Co., Findlay, Ohio
3. O.H. Materials Co., Trenton, New Jersey
4. Disposal Site (as yet, undetermined)

Regardless of where the response equipment is dispatched from, OHM will respond to the spill with project personnel extensively experienced in spill mitigation and cleanup techniques.

The following spill notification network shall be strictly followed for the Van Elswyck Property Project.

1. Truck driver to call project site;
2. Project site alerts response center; response commences;
3. Project site informs on-scene coordinator and project officer;
4. Project officer and on-scene coordinator notify local, state, federal authorities as necessary, and inform appropriate officials in accordance with developed contingency plan.

2.5 RESOURCES DEPLOYED

This section lists the personnel, equipment, expendables, etc. utilized at the Van Elswyck property site. for purposes of discussion, the cleanup has been segregated into tasks; during the acutal operation many of the tasks are performed concurrently. The tasks are presented as follows:

Task I Mobilization/Demobilization

Task II Operations

Task III Set Up, Tear Down, & Site Restoration

Task IV Analytical

Task V Travel and Per Diems

Task VI Transportation and Disposal

2.5.1 TASK I: MOBILIZATION/DEMOBILIZATION

Personnel

Level	Straight Time Hours.	Overtime Hrs.
Project Manager	32	
Supervisor	16	
Chemist	32	
Foreman	16	
Operator	32	
PCT	16	
Recovery Technician	208	24

TASK I: MOBILIZATION/DEMOBILIZATION

Equipment

Item	Number of Units
Over-the-Road Tractor	24
Lowboy	12
Vehicles	12
Box Trailer	4
Over-the-Road Tractor Mileage	9600 mi
Vehicle Mileage	3600 mi

2.5.2 TASK II: OPERATIONS

Personnel

Level	Straight Time Hrs.	Overtime Hrs.
Project Manager	32	8
Supervisor	120	90
Foreman	120	90
Operator	240	180
PCT	120	90
Recovery Technician	480	360

TASK II: OPERATIONS

Equipment

Item	Number of Units
Vehicles	63
Box Trailer	21
Decontamination Trailer	21
Laser	17
Decontamination Pad	17
215	168
955	168
Grappler	10
Half-Face Respirator	134
50,000 Gallon Pool	20
2" Electric Subm. Pump	17
3" Trash Pump	20
Manifold Breathing Appar.	26
Emergency 5-min. SCBA	26
Photoionization Detector	16
Explosimeter	16

TASK II: OPERATIONS

Expendables and Rental Items

Item	# of Units
Samples Gloves	2,000
Disposable Boots	2,000
Disposable Suits Tyvek	320
Disposable Suit Saranex	20
Disposable Hoods	268
Resp. Cartridges	134
Sample Jars	200
Disposable Tubes	50
pH Papers	5
Duct Tape	100
Garbage Bag	2
Hazardous Waste Labels	150
Visqueen	30
Breathing Air	52
Top Soil	
Electricity, Est.	
Electrical Service, Est.	
Telephone, Est.	
Overpack Drums	50
Office Trailer	30
Pool Liner	1

2.5.3 TASK III: SET UP, TEAR DOWN, SITE RESTORATION

Personnel

Level	Straight Time Rate Hours	Overtime Hrs.
Project Manager		
Supervisor	40	20
Foreman	40	20
Operator	80	40
PCT	40	20
Recovery Technician	160	80
Breathing Air Surcharge	336	

Task: III EQIUPMENT

Item	Number of units
Vehicles	15
Box Trailer	5
Decontamination Trailer	6
Laser	3
Decontamination Pad	3
215	48
955	48

Task III: EXPENDABLES & RENTAL ITEMS

Item	#Units
Sample Gloves	240
Disposable Boots	240
Disposable Suits Tyvek	36
Disposable Hoods	18
Respirator Cartridges	9

2.5.4 TASK IV: ANALYTICAL

Item	# of Units
Compatibility & PCB Screen	50
RCRA Analysis & Extraction	15
Priority Pollutant	
Liquid	5
Solid	5
PCB Solid & Sediments	10
PCB Liquids	10

2.5.5 TASK V: PER DIEM AND TRAVEL

Mobilization and Demobilization

Item	# of Units
Per Diem	48
Flights	18

Operation

Per Diem	235

Set Up, Tear Down, and Site Restoration

Per Diem	54

2.5.6 TASK VI: TRANSPORTATION AND DISPOSAL

Item	#Units
Solids	
Disposal	2000 yards
Transportation	100 loads

Notes: 1. Tentative disposal facility: ACES
2. Assume 1.5 tons/yard^3
3. Assume 20 yards^3/load

Liquds	
Disposal	30,000 gallon
Transportation	6 loads

Notes: 1) Tentative faclity
Dupont, Deepwater, NJ

Drums	
Disposal	50 overpack
Transportation	1 Load

2.6 Contingencies

The following are several factors which may alter the smooth progress of work on this project. OHM has evaluated each of these possibilities and has the manpower and equipment to provide cost-effective solutions should they arise.

PROBLEM	SOLUTION
1. Large volume water recharge recharge in the pit area.	1. Dewatering and on-site treatment (See Section 3.3)
2. Wastes in close proximity to or under the Van Elswyck house.	2. Temporary Support, Pilings moving of the house.
3. Large numbers of drums	3. Replace overpacking with compatability/bulking procedures to reduce per drum analytical and disposal costs.
4. Extremely Hazardous or Toxic Wastes	4. OHM will have an extensive inventory of personnel protective equipment on site including Level A protection.
5. Explosive, Reactive or Radioactive Waste	5. OHM personnel are experienced at bonding, transporting, reacting or isolating these materials.
6. Lab Pack Drums	6. Repackage, identify and/or bulk items for safe disposal. OHM has extensive experience at handling this type of waste.

3.0 TRANSPORTATION AND DISPOSAL

This section addresses the approach and procedures for transportation and disposal of waste materials. Since OHM does not own or operate a disposal facility or waste transportation fleet, a qualified subcontractor will be selected for transportation and disposal of waste material. We feel that this offers a cost-effective solution because competitive quotes can be evaluated for selection of a least-cost vender. OHM has considerable experience in subcontracting transportation and disposal and thereby can get the entire project completed efficiently.

3.1 TRANSPORTATION

Over-the-road transportation of any of the Van Elswyck waste materials will be during daylight hours along designated routes. Only licensed waste hauling vehicles will be used. Drum loads will be shipped in box trailers. Solid chemical waste will be transported in lined and covered 20 cubic yard containers. Liquid wastes shipped off site will be transported in bulk tank trucks. All state and federal regulations pertaining to identification of a load (i.e., placarding, labeling, bill of lading), and the manifest tracking system will be complied with.

3.2 DISPOSAL

Prior to selecting a disposal facility, a decision will be made regarding the cost effectiveness (or otherwise desirability) of resource recovery options. Controlled chemical incineration will also be evaluated such that given a set of constraints by the OSC, the minimal cost solution to the treatment and disposal issue can be calculated and approved.

OHM will thoroughly investigate the transportation and disposal options available for hazardous waste generated at the Van Elswych site. At least three competitive quotes will be received for each specific waste type actually found at the site. Each location will be evaluated in the best interest of the USEPA. Evaluation will be based on the following parameters:

1. regulatory compliance,
2. site availability,
3. costs, and
4. approval of the OSC and disposer's state.

A list of potential disposers has been generated and is listed in Tables 3.2-1 and 3.2-2. These tables include EPA identification number, date of last inspection and other pertinent information.

3.3 On-Site Treatment Option

In the event that large volumes of groundwater entrusions are encountered an on-site treatment system could be supplied by OHM.

This system would provide a cost-effective alternative to the transportation and disposal of aqueous wastes.

This system would include the following equipment and materials:

EQUIPMENT	MATERIALS
Mobile Clarifier	Granular Activated Carbon
Pump Station	Filter Sand
Flash Mixer	Gravel
High Capacity Multi-media Filter	Caustic
Dual Cell Activated Carbon Filter	Acid
50,000 gallon Holding Pool	Polymer

During the initial stages of the groundwater collection in the excavation, the OSC and OHM supervisor will determine if water recharge to the pit will be sufficient to makek the use of the on-site treatment equipment cost-effective. Use of the treatment system will be contingent upon the availability of necessary discharge permits from USEPA and Pennsylvania DER.

Table 3.2-1

DISPOSAL SUBCONTRACTOR DATA

Company Name	Address	EPA ID#	Type of Facility	Date Last Inspected	Telephone #
SCA Waste Services	1135 Balmer Rd. Box 200 Model City, NY 14107	NYD049836679	Landfill	5/3,4/83	716-754-8231
CECOS Int. Inc.	P.O. Box 619 Niagara Falls, NY 14302	NYD080336241	Landfill		716-731-3281
CECOS Int. Inc.	4879 Spring Grove Ave. Cincinnati, OH 45232	OHD087433744	Landfill	2/9/83	513-681-5731 Federal Insp.
Fondessy Ent. Inc. (ACES)	876 Otter Creek Rd. Oregon, OH 43616	OHD045243706	Landfill Land Farm	6/12/83	419-726-1521
Chemical Waste Management	Box 628 504 Liberty St. Fremont, OH 43420	OHD020273819		Deepwell Ins.	419-332-2688
Chemical Waste Management	Emelle, AL 35459	ALT000622464	Landfill		205-652-9531
Chemical Waste Management	Toledo, OH				
. DuPont DeNemours	Chamber Works Technical Laboratory-D Rt. 130 Deepwater, NJ 08023	NJD002385730		6/10/82	609-299-8098
lins Environmental Services Inc.	Rts. 332 & I-295 Bridgeport, NJ 08014	NJD063288239	Incin.	6/10/82	609-467-3105
mirosafe Services	115 Gilbralter Rd. Horsham, PA 19044	PAD980554893 PAD098160906	Landfill Landfill		215-441-5900 (Home Office)
CA Chemical Services	Box 255 Route I Pinewood, SC 29125	SCD070375985	Landfill		803-452-5003

Table 3.2-2

DISPOSAL SUBCONTRACTORS AND MATERIALS HANDLED

Disposal Sources	Solids			Liquids				Processing
	Organic	Inorganic	PCB	Aqueous	Organic	PCB	Reactive	
SCA Chemical Waste Services, Inc. Model City, NY	yes	yes		yes	yes		yes	Distilation, Phase Separation
CECOS Int. Inc. Niagara Falls, NY	yes	yes	yes					
CECOS Int. Inc. Cincinnati, OH	yes	yes	yes		yes	yes		Chemical and Biological, etc.
Pondessy Ent. Inc. Oregon, OH	yes	yes		yes				Neutralization, Precipitation
Chemical Waste Management Fremont, OH				yes				
Chemical Waste Management Emelle, AL	yes	yes	yes	yes		yes		Neutralization, Fixation
Chemical Waste Management Toledo, OH	yes	yes						
E.I. DuPont DeNemours Deepwater, NJ				yes	yes			Neutralization, Chemical and Biological
Rollins Environmental Services Bridgeport, NJ				yes	yes			Neutralization, Precipitation
Envirosafe Services Inc. Horsham, PA		yes						Chemical Fixation
FMC	yes	yes						
SCA Chemical waste Pinewood, SC	yes	yes			yes			Centrifying, Filtration, Precipitation

4.0 PROJECT MANAGEMENT

This section presents OHM's approach to integrating all project activities in order to ensure the safe, timely, and efficient completion of the project. The management approach is discussed and the resources to be utilized in the various tasks are described.

4.1 MANAGEMENT APPROACH

OHM believes that careful project management is the key factor in assuring that work elements are successfully completed within prescribed time limits, while maintaining strict standards of product quality. The specific management approach to each work element will be tailored to its magnitude and complexity, thereby allowing project personnel to focus their particular skills and expertise, while maintaining overall coordination of effort through the Project Manager.

OHM has developed a system for project management based on successful completion of numerous projects. Coordination of the total work effort is effected through a management approach characterized by:

1. Administrative control
2. Technical control
3. Financial control

Pertinent administrative procedures and reports that provide these controls are discussed in Appendix B.

4.2 PROJECT MANAGEMENT ORGANIZATION

The project management organization structure is illustrated in Figure 4.2-1. The Project Director provides executive-level liaison between OHM and OSC while day-to-day workings of the project team are coordinated by the Project Manager and the OSC. Four specific functional areas of project execution are identified: regulatory liaison, transportation, cleanup operations, and disposal. Each of these areas is coordinated by one or more key personnel. Each of these key personnel leads a team providing specific skills needed to fully address the work effort.

Safety and health and quality control are integral parts of all OHM's projects. These functions are usually coordinated by someone not involved in the day-to-day project activities to promote objectivity. Also, the responsible personnel report directly to the Project Director. Of course, project personnel are also intimately involved in safety and quality control on a day-to-day basis.

4.3 PROJECT COORDINATION AND COMMUNICATION

The OHM project team will be activated within 5 days of award of the contract. The following actions will be taken to ensure that the team effort will result in a timely, cost-effective, top-quality program. During the first week after authorization to proceed:

1. The OHM's Project Director, Project Manager and other key personnel will meet with the Contracting Office and the OSC to review project scope, objectives and methodology.

2. Communication links between EPA's and OHM's personnel will be established.

3. The EPA's staff, together with the Project Manager will modify the plans presented by OHM as appropriate.

4. Field equipment will be assembled.

Based on the first two weeks' activities, the OSC will approve the detailed work plans agreed upon. The entire project team will meet to review plans in detail and clarify assignments. Throughout this period and for the duration of the project, the Project Manager will maintain close contact with the OSC to assure proper coordination of all efforts.

As the program proceeds there will be periodic formal review meetings to insure timely review of all data and provide an opportunity for mid-course corrections to the program, based either on the needs of the OSC or the recommendations of OHM. However, no such changes will be made without mutual agreement between the OSC and OHM's staff and written authorization. Minutes of these meetings, supplemented by progress reports, will be issued by OHM within seven days after each meeting.

Between formal review meetings, it is anticipated that close contact between the OHM's team and OSC will assure that EPA's personnel are aware of any potential problems, and that concerns are addressed expeditiously. OHM's Project Manager is responsible for maintaining proper documentation of the project, including substantive telephone communications and decision-related agreements between the OSC and OHM.

4.4 SUBCONTRACTOR MANAGEMENT

OHM is experienced in subcontract management and has the systems and procedures for effective subcontractor management already in place. Transportation and disposal projections will be performed during the course of the project. These projections will be made based on the types and quantities of actual recovered wastes. Such projections will allow for mid-course budgetary adjustment for transportation and disposal.

4.5 PROJECT MANAGEMENT TEAM

The project management team which will be utilized for the Van Elswyck Property project is graphically presented in Figure 4.5-1. These personnel have been specifically picked for their assignments in this project based on their training and experience in their areas of responsibility. Resumes of these key individuals and other personnel available to contribute to the project are presented in Section 7. Resumes of the following OHM personnel are included:

Personnel	Project Function or Position Title
J. R. Kirk	Project Director
R. H. Panning	Project Manager
W. F. Warner	Safety and Health Coordinator
S. E. Insalaco	Quality Control Coordinator Regulatory Liaison
R. M. Graziano	Regulatory Liaison
W. C. Studabaker	Transportation
J. R. Hitchings	Transportation
S. O. Smith	Cleanup Operations
L. E. Reese	Supervisor
S. C. Day	Disposal
C. B. Daniels	Explosive - Reactive Handling
T. M. Smullen	Explosive - Reactive Handling

4.5.1 Identification of Problem Areas

Before the project begins the OSC, project manager, field supervisor, and technical personnel will develop a site specific contingency plan for the Van Elswyck Property site. Inclusive in the contingency plan will be identification of potential problem areas that may be encountered during the course of the project. These areas may include:

1. Provision for off-site and on-site evacuation.

2. Methodology for handling:

   a. toxic gas release
   b. fire
   c. explosives
   d. leaking containers
   e. large volumes of acutely dangerous substances
   f. medical emergencies
   g. transportation incidences
   h. spilled substances

3. Transportation routes (explosive - reactive transport)

Other problem areas which may be identified and addressed include:

a. transportation and disposal scheduling
b. excessive inclement weather
c. site access
d. site security
e. site publicity (all handled through OSC)

After these problem areas have been identified the solution to these problems will be proposed within the contingency plan. These solutions will result from the mutual agreement of all parties concerned as well as the final approval of the OSC.

4.5.2 Problem Solving (Potential Actual)

When a potential problem area is identified before or during the project, the OSC, project manager, field supervisor, and the necessary technical personnel will meet to discuss and resolve the best solution and/or technique to avoid the potential problem. The contingency plan which is developed in cooperation with the OSC will be utilized as a resource for evaluation of potential problem areas as well as for the formation of resolution to the problem.

When an actual problem arises during the course of the project, the same management personnel will assemble. The decision making process, however, may be accelerated due to the nature of the problem.

In all cases, the EPA OSC will make the final decision as to how best to resolve all problems. OHM's personnel will make recommendations and/or develop procedures to present to the OSC for his approval. These recommendations or procedures will be based on the combined experience base of the project manager, field supervisor, and the required technical personnel.

OHM's project team is extensively experienced in potential and actual problem solving. The combined team has solved literally thousands of operational/environmental problems associated with the cleanup of abandoned hazardous waste sites. The best evidence of this problem solving experience is the resumes of the key program team as presented in Section 7.

Additional evidence of OHM's experience with problem solving is presented in the project summaries Section 6.0. Your attention is directed to the project summaries of similar nature to the Van Elswyck Property project. These include:

1. Cleanup, decontamiantion and water treatment chemical facility;

2. Hazardous waste site cleanup (valley of the drums);

3. Cleanup disposal and water treatment of waste site, Goose Farm, NJ and;

4. Two piggy back trailers of barreled calcium carbide;

4.6 PROJECT MANAGEMENT ACTIVITIES

Figure 4.6-1 illustrates the flow of various project activities and the relationship of those activities o the time line. Included in these activities are three project management tasks. The first is the project management program which consists of a series of weekly progress meetings and reports. During these meetings the Project Manager or Supervisor will discuss the technical progress of the project and any necessary schedule changes in relation to the project time table (Figure 2.5-1) and the project management flow chart. Additionally the functioning of the project health and safety programs and results of the analytical program will be discussed at the progress meetings. As appropriate interim analytical reports will be issued with the weekly progress reports.

The second task is the cost control program. This consists of a series of weekly meetings at which a report of costs to date, and projections of the following weeks costs will be presented.

The third task is the project quality assurance program. This program is designed to monitor the performance of the project as a whole in general and specifically the analytical program. The quality assurance plan is outlined in Appendix C.

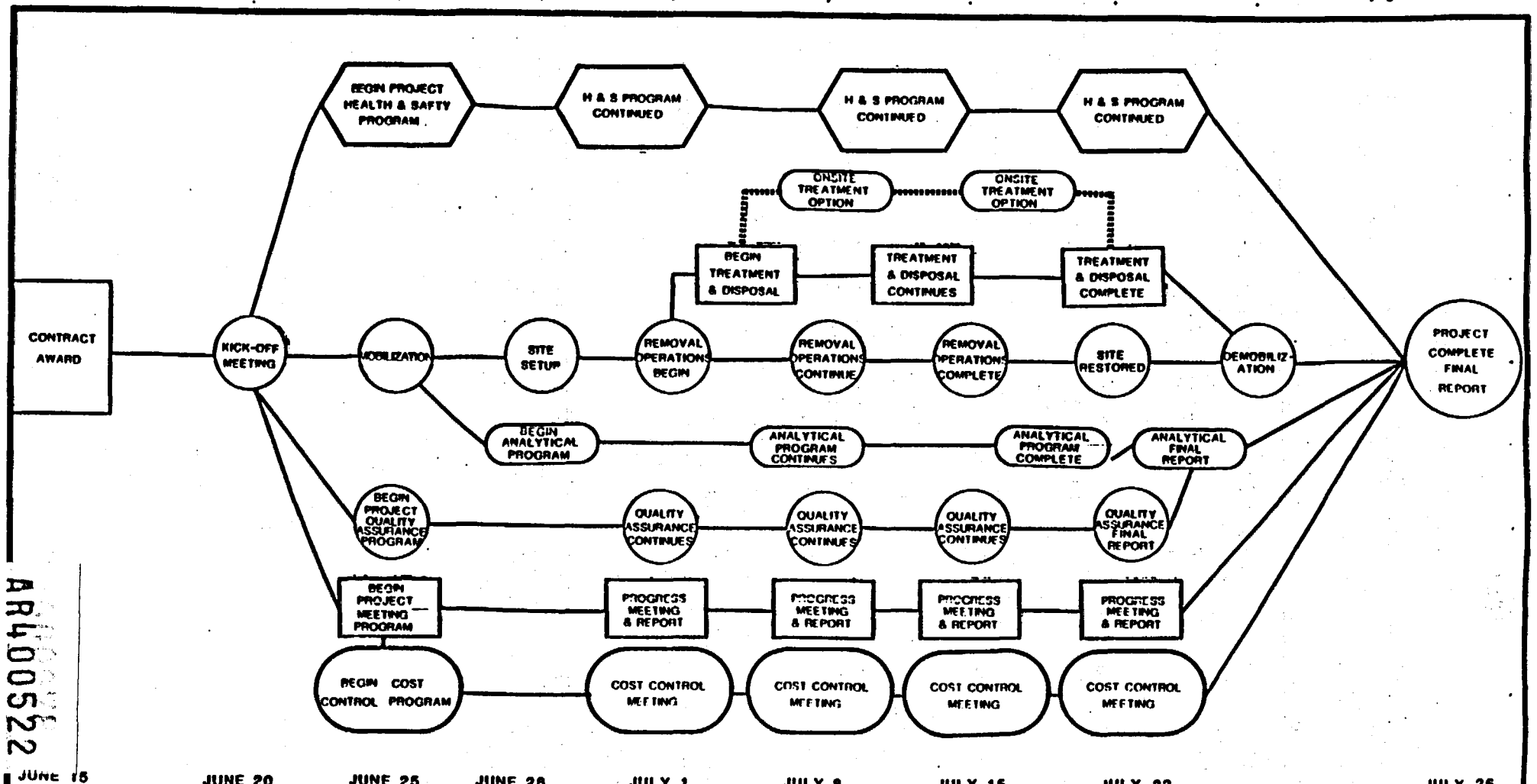

FIGURE 4.6-1

SCALE	DRAWN BY	NO.	DATE	REVISION	BY
NONE	C. MEEHAN				
DATE 6/9/83	CHECKED				
SHEET_ OF_	APPROVED				

PROJECT MANAGEMENT FLOW CHART

O. H. MATERIALS CO.
EMERGENCY RESPONSE AND ENVIRONMENTAL RESTORATION
BOX 551 FINDLAY OHIO
419-423 3526 800 537 9540

PROJECT	DRAWING	REVISION

5.0 REGULATORY COMPLIANCE

OHM's operations during the project will comply with all applicable federal, state, and local regulations. OHM has specifically addressed the following regulations:

1. The Resource Conservation and Recovery Act, Public Law 94-580

   RCRA regulations, effective November 19, 1980, cover generating transporting, storing, treating, and disposing hazardous wastes. The regulations require manifesting of all wastes shipped from the site. These manifests must be signed by the generator.

2. The Toxic Substances Control Act: 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

   This regulation governs the handling, testing, packaging for shipping, and disposal of PCBs and PCB-contaminated substances.

3. Transportation: 49 CFR Parts 100 to 199

   This regulation governs the transportation of hazardous materials. Hazardous materials shipped from the Van Elswyck Property site will comply with these regulations.

4. Occupational Safety and Health Administration

   OSHA has regulations governing hazardous waste site cleanup operations. OHM's operations have been inspected and approved by OSHA's investigators.

5. Pennsyvlania

   OHM's operations during the project will comply with all Pennsyvlania's hazardous waste regulations. These regulations follow the guidelines as set by the Resources Conservation and Recovery Act.

6.0 CORPORATE QUALIFICATIONS

This section presents the qualifications and experience of O.H. Materials Co. (OHM) which makes the Company uniquely qualified to perform this project. Personnel qualifications and experience, selected project experience, facilities and equipment available for use, and the emergency response capability of OHM are discussed in the following sections.

PERSONNEL

OHM has 200 full-time employees, including engineers, chemists, biologists, skilled craftsmen, and experienced technicians. Field personnel are extensively trained in the use of protective equipment and safety procedures which are used in hazardous spill situations. Technical personnel remain continually aware of new development in the treatment, containment, or handling of hazardous materials. Resumes of OHM's personnel available to contribute to the project are presented in Section 7.0.

SELECTED PROJECT EXPERIENCE

OHM is one of the foremost firms in the country specializing in hazardous material cleanup and environmental restoration. Within the last several years, OHM has been successful in solving over 2,000 environmental problems ranging from cleanup of oil and chemical spills to the collection and disposal of hazardous materials and stored wastes products.

A summary of OHM's project experience is presented in Table 6.0-1.

Written project summaries of a few of OHM's completed projects are presented in this section.

SELECTED PROJECTS

	Contracting Activity and Address	Contracting Officer's Name & Phone Number	Project Location and Contract Number	Project Type	Award Price/Cost Final Price/Cost	Period of Performance
1	USEPA, Region III Curtiss Building 6th & Walnut Streets Philadelphia, PA 19106	Mr Thomas I Massey 215-597-9898	Hagerstown, MD and Fort A P Hill, VA I-C005	Explosive Yellow Phosphorus	Emergency $100,000 Estimate $ 93,000	4/79-5/79
2	City of Lafayette 20 North Sixth Street Lafayette, IN 47901	Mr. Phillip New 317-742-4045	Lafayette, Indiana P O N-9-52-0071 FX	Explosive Lab Chemicals	Emergency $25,000 Estimate $18,000	4/79-4/79
3	Drexel Chemical P O Box 9306 2487 Penn Street Memphis, IN 38100	Mr Robert Uchechey 901-774-4370	Memphis, Tennessee Commercial	Chemical Warehouse Fire	Emergency $250,000 Estimate $200,000	7/79
4	Termines International 855 Ridge Lake Boulevard Memphis, IN 38117 901-767-8720	Mr John Krafft 502-969-1345	Louisville, Kentucky Commercial	Chemical Warehouse Fire	Emergency $30,000 Estimate $25,000	1/80
5	Department of the Army Construction Engineering Research Lab P O Box 4005 Champaign, IL 61820	Colonel Louis J. Circeo Corps of Engineers 217-352-6511	Champaign, Illinois DACA88-80-C-0004	PCB Transformer Explosion	$16,500 Estimate $14,000	1/80-2/80
6	Consolidated Rail Corp. 347 Madison Avenue New York, NY 10017	Mr Tom Hearsheimer 212-340-2216	Croton-on-the-Hudson Commercial	PCB Wastewater Tertiary Treatment	$3,160,000 to date	4/80-present
7	New Jersey Department of Environmental Protection P O Box 1390 Trenton, NJ 08625	Mr. Paul Giardino, Director Haz. Management Program NJDEP 609-292-9560	Elizabeth, New Jersey #A02425	Hazardous Waste Site Cleanup	$22,000,000 Est $19,000,000	4/80-6/81
8	Shell Chemical Company One Shell Plaza P O Box 2463 Houston, TX 77001	Mr. Jerry Weld 713-241-6161	National Pickup P O #348538	Banned Pesti- cides Pickup	$90,000 Estimate $44,273	5/80-6/80
9	Consumer Power Company 2500 East Cork Street Kalamazoo, MI 49001	Mr. Robert Stickland 616-318-6130	Battle Creek, MI Commercial	Explosive Range Cleaning	Emergency $15,000 Estimate $10,500	3/81-4/81
10	Illinois Environmental Protection Agency 2200 Churchhill Road Springfield, IL 62706	Mr Geoff Langley 217-785-1868	Leaf River, Illinois Contract 8028-53230-1900-00-9	Drum Removal	$15,000 Estimate $13,000	5/81

	Contracting Activity and Address	Contracting Officer's Name & Phone Number	Project Location and Contract Number	Project Type	Award Price/Cost Final Price/Cost	Period of Performance
11	Norfolk & Western Railway Co 8 North Jefferson Roanoke, VA 24042	Mr. Paul Henson 709-981-4351	Wakefield, Virginia	Train Derailment, Creosote		5/01 - 6/01
12	Commonwealth of Massachusetts Dept of Environmental Quality & Engineering One Winter Street Boston, MA 02108	Mr. William A Simmons 617-727-3855	Kingston, MA	Abandoned Hazardous Waste Site Cleanup	Contract $515,000 Estimate $419,000	7/01-9/01
13	USEPA, Region IV 345 Courtland St., NE Atlanta, GA 30365	Mr. Warren Dixon 404-881-3931	Columbia, SC Contract 868-94-0002	Abandoned Hazardous Waste Site Cleanup	Contract $264,000	9/01-10/01
14	Enterprise Products Co 2727 North Loop West P O Box 4324 Houston, TX 77210	Mr. Frank Chapman 713-880-6500	Mansfield, Louisiana	Subsurface Gasoline Treatment	$64,300	10/01-12/01
15	Metro Dade County Office of Transportation Administration 911 Courthouse Miami, FL 33130	Mr. John Driest 305-579-5580	Miami, Florida Contract #DOTA-04	Abandoned Hazardous Waste Site Cleanup	Contract $2,000,000 Est. $1,540,000	12/01-1/02
16	USEPA, Region III 6th & Walnut Streets Philadelphia, PA 19106	Mr. Thomas I Massey 215-597-9858	Lockhaven, PA Contract 868-93-0011	Abandoned Hazardous Waste Site Cleanup	Contract $[illegible] Estimate $847,000	2/02-6/02
17	Union Oil Co P O Box 4147 Atlanta, GA 30302	Mr. W. Carroll Jackson 404-321-3471	Franklin, Ohio H-30439	Subsurface Diesel Oil Isolation & Treatment	$57,900	4/02-6/02
18	State of Rhode Island Environmental Management Air & Hazardous Materials 204 Cannon Bldg., 75 Davis St Providence, RI 02908	Mr. Barry Muller 401-277-2808	Coventry, Rhode Is. P O #00373	Abandoned Hazardous Waste Site Cleanup	Contract $2,000,000 Est. $1,400,000	4/02-7/02

FACILITIES AND EQUIPMENT

This subsection describes OHM's facilities and equipment resources which can be applied to projects as needed.

Facilities

OHM is headquartered in Findlay, Ohio, and has regional offices in Atlanta, Georgia; Ottawa, Illinois; Minneapolis, Minnesota; Ocoee, Florida; Lexington, Kentucky; and Trenton, New Jersey. Emergency crews and equipment can be mobilized from all locations. The headquarters office in Findlay houses the main laboratory, equipment fabrication shop, equipment storage yard, computer facilities, library, and administrative services. These facilities serve as backup to the regional offices and to any operations taking place in the field. The main lab and fabrication shop are discussed in more detail in the following paragraphs.

Main Laboratory

The major specialty of the main laboratory is analysis of hazardous material from various sample matrices. The laboratory provides both qualitative analyses, utilizing state-of-the-art identification procedures not commercially available, and quantitative analyses for specific compounds from virtually any sample matrix.

One major aspect of any emergency services company is its ability to provide rapid turnaround of results. The service provided by O.H. Materials Co.'s laboratory is unparalleled in this respect. However, high quality results are never compromised due to fast turnaround. A stringent quality assurance program is integrated into all laboratory procedures and analyses.

The O.H. Materials Co.'s laboratory specializes in the use of mass spectrometry for hazardous material identification and quantification. Virtually all GC/MS procedures are performed by high resolution capillary column GC/MS techniques.

O.H. Materials Co. maintains, uses, and develops specific analytical protocols. The laboratory maintains all of the current promulgated government analytical procedures as well as consensus procedures. Since very few procedures have been promulgated for hazardous material analysis, the laboratory has developed and utilizes, on a routine basis, specific state-of-the-art analytical procedures.

In addition to those specific analyses, the main laboratory has analytical capability for other more routine analyses such as TOC, flask point, heat content, metals analysis, etc. Additionally, laboratory personnel maintain membership in professional organizations, particularly those which are involved with environmental analytical procedures.

A library of concensus and federally published analytical procedures is maintained and kept up to date; further, the interfacing data communication hookup with the MISS (M.I.T.) library computer search system provides O.H. Materials Co. with a broader base for searching compounds and for examining detailed physical characteristics and toxicological information.

Quality control for the analyses of samples establishes valid results for laboratory purposes. A rigid system for chain-of-custody handling of samples assures the chemists and clients that there is a legal, accurate record for following the samples from sources to final analyses.

Equipment Fabrication Shop

OHM's Equipment Fabrication and Repair Division specializes in developing, designing, and constructing the environmental spill control equipment required during the cleanup and containment of hazardous material spills. All environmental spill control equipment and systems are designed and constructed by skilled, certified ASME code welders. The equipment manufactured by OHM includes mobile laboratories, decontamination trailers, fume scrubbers, pneumatic transfer receivers, transfer stations, clarifiers, compatibility chambers, simulators, galley trailers, underground recovery systems, and carbon filters. In addition to designing and fabricating mobile facilities, standard production trucks and vehicles are modified to accommodate the needs of our emergency response and support operations. Shop maintenance of all vehicles and equipment is accomplished on a scheduled and regular basis.

Equipment

OHM has an extensive inventory of emergency response equipment including:

* Vacuum equipment
* Trucks and trailers
* Protective clothing
* Protective equipment
* Recovery and treatment equipment
* Analytical and research equipment
* Chemical transfer equipment
* Construction equipment
* Lights and generators
* Compression equipment
* Water equipment
* Pumping equipment
* Miscellaneous tools and equipment
* Aviation equipment
* Communication equipment

Many of the major equipment items are fabricated by OHM's fabrication shop. The following paragraphs discuss a number of these special items.

OHM Field Analytical Laboratory

O.H. Materials Co. designs and constructs Field Analytical Units (FAU) to meet its unique demands for high-volume, field-based analysis. These units are designed to support the following analytical methods:

1. Compatability analysis
2. Gas chromatography and gas chromatography/mass spectrometry
3. Liquid chromatography
4. TOC/TOX
5. Air sampling and analysis
6. Atomic absorption
7. Mass spectrometry

Each of the OHM's eight laboratories can also be modified to do specific analysis as required by each contract.

These FAU's (42 feet in length) support up to four chemists, two gas chromatographs, and one additional analytical function such as organic extraction of soil or water samples. Multiple heating/air conditioning units and fume hoods maintain constant and safe environmental conditions within the laboratory unit. Each unit also contains its own laboratory-grade water-treatment system, line voltage regulators, and safety equipment. It is designed as a self-sufficient, safe, and efficient unit for all types of chemical analyses.

For start-up, the FAU needs only a power hook-up. Its water tank is capable of holding 250 gallons (purified through resin beds and carbon), and the gas lines can accommodate six types of gases. The unit is equipped with safety features such as a shower, eye wash, first-aid kits, and fume hoods. Its efficiency is optimized by its 42-foot length, 29 feet of counterspace, storage space, and the complete outfitting for organic and inorganic analyses. High volume extractions of soil, air, and water samples are standard. A separate storage area in the rear of each trailer keeps the work area clear.

Capable of sustained use, these units have functioned for over 10 months at remote locations and, with a full complement of personnel, have analyzed up to 150 samples per 24-hour periods. This proven versatility gives the OHM's site management (and the client) the flexibility to make immediate decisions on the basis of scientific facts rather than conjecture. Also, more cost-effective use is made of all equipment and personnel because test results are available within hours of sampling.

Experience has shown that only a full-sized, well-designed field unit can support major operations such as those performed by OHM.

Decontamination Trailer

Each decontamination trailer has the capability to provide 14 men with enough protective equipment to fulfill safely any specific demand. This equipment ranges from chemical suits with half-face respirators to bomb suits and self-contained breathing apparatus, depending on the situation. All personnel can change clothing or gear at this station to prevent carrying any contamination beyond the project location.

These trailers are designed with an independent, self-storing water system and are completely equipped with cleanup facilities including wash basins and showers, with hot water and outside water outlets. The trailers also contain emergency eye wash systems, emergency oxygen systems, and various first-aid supplies. Every trailer is also provided with a diesel generator to supply electrical power for lights, pumps, and other necessary equipment.

The large and varied inventory of equipment stocked in a decontamination trailer makes it a versatile and efficient unit. The variety of protective equipment enables OHM's personnel to respond quickly to unexpected contingencies of spill cleanup or decontamination operations. The self-contained electrical systems can reduce the support equipment necessary in many remote locations; for example, a generator can power necessary site lighting and office or storage trailer lighting.

Mobile Carbon Filters

OHM has also designed and fabricated mobile carbon filters. These filters use granular activated carbon inside cylindrical, fixed bed cells to remove organic materials from wastewater.

OHM's mobile carbon filters are fabricated in 1-cell, 2-cell, and 3-cell units, and are of carbon steel construction. The cell dimensions of a typical 2-cell unit are 8.3 feet in height by 6.8 feet in diameter and hold approximately 10,500 pounds of FS-300 carbon.

Each carbon filter is skid-mounted and able to be transported by truck, train car, barge, crane, etc., making the unit extremely mobile. Each unit is equipped with all the necessary piping, pressure gauges, and valves to allow the individual filter cells to be operated either in series or parallel, down-flow or up-flow, or as an individual cell. To allow convenient sample collection and monitoring of contaminant removal, sample valves have been installed on each unit.

Portable Clarifier

The portable clarifier is analogous to a primary clarifier at a wastewater treatment plant. The mobile clarifiers are 10,000-gallon capacity rectangular tanks constructed of carbon steel. The clarifier is used for removal of settled solids, removal of

suspended solids using pH adjustment or the additions of floccing agents, and the precipitation of heavy metals. Additionally, the clarifier can be used to adjust the pH of the water entering the carbon filtration units to maximize the loading of the carbon with the compounds being removed.

The clarifier increases the cost effectiveness of other treatment modules by removing most of the solids which would otherwise clog the multimedia filters and the carbon filters. If these solids were not removed, the frequency of prefilters media changes and carbon changes would be greatly increased, thereby increasing costs. The clarifier is equipped with surface skimmers, variable baffle configurations, and automatic sludge removal to facilitate the treatment of various waste streams.

Vacuum Skid Units

Vacuum units are indispensable when salvaging spilled products. These units are skid mounted to provide vacuum capabilities at remote sites and convert easily from trailer mounting to barge or railroad flatcar mounting. They can also be moved by bulldozer.

Vacuum units store up to 3,500 gallons of liquids and offload sludges under pressure. Equipped with varying lengths of hose and the capability to be pulled on a trailer, carried on a railroad flatcar, mounted on a boat, dragged by a bulldozer, or lifted by a crane or helicopter, these units are used to vacuum and discharge materials in locations too remote to be reached by conventional equipment. All vacuum equipment units are designed with vapor scrubbers to capture hazardous materials' vapors and are operated by diesel power.

Compatibility Chamber

The compatibility chamber is an OHM-designed and custom-built unit. Its purpose is to serve as a mixing chamber for bulking compatible liquids. It is used extensively for bulking hazardous materials and wastes from drums found at hazardous waste sites. The compatibility chamber is mobile and has a 10,000-gallon capacity.

The chamber is built to withstand heat from reaction when hazardous materials are bulked. Thermocouples mounted in the chamber constantly monitor temperature. The non-sparking bar scraper with explosion-proof drive prevents sludges and solids from entering the collection chamber. The hopper is designed for fast removal of materials and loading into tank trucks. The use of the compatibility chamber gives OHM a unique method of bulking liquid hazardous wastes safely and economically.

Transfer Equipment Trailer

OHM's transfer units are designed to meet the special needs

created by incidents requiring the transfer of hazardous materials. The transfer equipment trailers are equipped to handle many diverse commodities such as compressed gases, combustible and flammable liquids, corrosives, and viscous liquids.

Transfer trailer equipment includes: portable hydraulic power packs; high rate delivery pumps; viscous material pumps; acid pumps; nitrogen purging systems; pneumatic transfer systems with air dryers and fume scrubbers; steam heating equipment (up to 1,000,000 BTU); temperature monitoring devices; stainless steel, teflon-lined hoses; acid hoses; metering equipment; vapor control systems; power entry tools; tank patching equipment; and stainless steel, teflon, PVC, and other piping components.

In addition to the actual transfer equipment, these units carry such support equipment as cutting torches, welders' portable generators, lighting, scaffolding, tips, dies, hand tools, partner saws, blocking cables, chains, breathing air, self-contained breathing apparatus, respirators, respirator cartridges, emergency oxygen, first-aid materials, and portable eye wash showers.

Heated Volatile Organic Sparging Unit

The purpose of the heated volatile organic sparging unit (HVOSU) is to strip volatile organic contaminants from a wastewater stream. The unit is set up to provide either spray type and/or sparging air-water contacting. Mass transfer rates can be increased by raising wastewater temperature with a steam-fed tubular heat exchanger. The HVOSU is cylindrical in shape with approximate dimensions of 6'D x 12'H, of carbon steel construction, and is skid mounted so it is mobile. The unit is equipped with the appropriate temperature and pressure gauges, values, and auxiliary piping, thus making it a self-contained unit.

Remote Handling System (RHS)

The remote handling system consists of a hydraulically operated device which can grasp a drum or other similar container. The device can rotate through 360° to allow it to pick up drums that are stacked or piled at odd angles. The grasping device is attached to a backhoe. The backhoe is equipped with a full cab and 1-1/4" of Plexiglas shielding to protect the operator. Additionally, the backhoe is equipped with a 100-pound breathing air cylinder and a supplied air breathing mask for the operator. The RHS allows one man and one piece of equipment to move, stage for sampling, and empty drums without coming into direct contact with the drum or the material in it.

Alternative drum handling methods involve the use of 3 to 4 men, and multiple pieces of equipment to accomplish the same tasks in a much longer time and with much greater risks.

Crew Trailer

The crew trailer is designed and stocked to serve three purposes. This unit combines on a reduced scale the materials and equipment stock of a pollution control truck, and the facilities of both a galley trailer and an office trailer. The three functions supported by this unit are essential to every project; however, many projects do not warrant a separate unit for each function. The crew trailer provides an efficient and cost-effective method for essential job support for smaller projects.

Barrel Shredder

Commercially available drum and aerosol shredders have been specifically adapted by OHM for hazardous material processing. These shredders are modified to prevent release of hazardous liquid, gases, and solids during a shredding process. All entrance points to the shredders are sealed and tested to be water tight. Spray nozzles are placed in the interior of the shredders to rinse the shredder and sidewalls prior to opening. An air tight lid accompanied with a vapor recovery vacuum system prevent atmospheric emissions of volatile substances from the shredders. These shredders can be further adapted and modified if necessary to handle most all types of containers and materials.

EMERGENCY RESPONSE CAPABILITY

OHM's services have been widely used by the oil, chemical, and transportation industries and by local, state, and federal regulatory agencies to control emergencies and to deal with complete cleanup activities at hazardous waste sites or other locations where a comprehensive plan of action is needed. OHM has a full-time, full-service emergency response capability which has been adapted to the needs of clients throughout the continental United States and parts of Canada.

OHM employs over 200 trained, full-time employees. Field workers are instructed through weeks of training to familiarize themselves with the specialized protective equipment and safety procedures which are used in hazardous material spill situations. Also, OHM maintains a staff of trained technicians and specialized equipment on call 24 hours a day so that OHM can respond immediately to environmental problems of all types. Because jet and turbo-prop aircraft allow access to small airports, personnel arrive quickly on the scene to handle the immediate problem. A full fleet of other vehicles provide transportation needs for equipment and manpower.

OHM's personnel can deal with a variety of spills from oil to toxic chemicals--even chemicals that must be cleaned to within a parts-per-billion range. In some cases, spilled substances can be neutralized; in other cases, OHM's unique underground recovery system can be installed to remove contaminants in soil or water

while plant operations or transportation activities remain operational. OHM's skilled technicians have the experience and specialized protective equipment to perform effectively and safely in hazardous situations. Facilities and equipment available to support emergency response efforts are presented in previous sections.

OHM can mobilize men and equipment from five locations and equipment from two locations, for a total of seven (7) response centers:

1. Findlay, Ohio
2. Atlanta, Georgia
3. Ottawa, Illinois
4. Ocoee, Florida (Equipment only)
5. Lexington, Kentucky (Equipment only)
6. Trenton, New Jersey
7. Minneapolis, Minnesota

All equipment and personnel are maintained field-ready capacity so that both can be mobilized immediately upon notification. Men and selected response equipment can be flown to a site; other equipment not needed until a later time can be transported by truck to the site.

An organization dedicated to emergency response and environmental restoration, O.H. Materials Co. has utilized communications to assure that channels among field crews, supervisors, and management is maintained, both horizontally and vertically.

The Company uses a communication network combining the use of radio telephones, company UHG radio systems, marine band radios, toll-free number capability to the Dispatch Center at Corporate headquarters, and any other necessary communications which are found necessary for open lines between crews and management and/or supervisory personnel.

At project sites a "buddy" system is used to give an added safety measure, and two-way, hand-held for attached radios are available for immediate reporting of problems, changes in routing, or any other on-scene activity.

In any emergency or situation threatening the safety of the environment or the health of those nearby, instant and knowledgeable decisions must be made based on input of those aware of the problem; the decision then has to be communicated to those affected.

Vehicles of various types and jet and turbo-prop aircraft are available for physical transportation of crews and supervisor for emergencies or relief duties.

Project Title: Cleanup, Decontamination, and Water Treatment of Chemical Facility Following a Fire and Explosion

Client: New Jersey Department of Environmental Protection, Elizabeth, New Jersey

Chemical Control, an illegal hazardous waste facility storing over 60,000 drums of unknown contents, caught fire in a spectacular blaze. Drums of waste ignited being propelled hundreds of feet in the air and exploded causing a rain of toxic chemicals in the surrounding area. Evacuation of residents, schools and business was initiated due to the noxious and toxic fumes produced by the fire. Contaminated water from fire fighting efforts and uncontained liquid wastes from the site entered the Elizabeth River and adjacent properties creating an emergency situation.

O.H. Materials Co. (OHM) was contracted by the New Jersey Department of Environmental Protection (NJDEP) to provide a safe and efficient means of categorizing and containing all liquids, drums, solids, building components, and other objects contaminated by the fire and explosions.

Due to the many unknown elements involved with the site, a very elaborate safety plan for personnel had to be instituted. Very little space remained uncontaminated on the peninsula; therefore, decontamination facilities, offices, galley trailers, and field laboratory facilities had to be located away from the site. All personnel were protected from the hazardous environment by self-contained breathing apparatus and protective clothing. Also, disposable protective clothing and respiratory protection were utilized by personnel outside the work area to protect them from dust. Air quality was monitored on a twenty-four hour basis with MIRAN units, photoionization detectors, specific detection tubes, and personnel monitoring devices.

During a period of less than five months the majority of the severely toxic and explosive materials were removed and prepared for disposal or detonation without incident. All remaining buildings and foundations were excavated, sampled, and transported to an approved landfill. Over 5,000 drums containing lab reagents, carcinogens, pesticides, explosives, compressed gases, liquids, and various other specialty chemicals were screened piece-by-piece and repacked in safe containers.

The remaining drums containing liquids and solids were bulked according to compatibility tests. The compatibility analyses allowed compatible wastes to be bulked together for disposal. This procedure provided a more cost-effective disposal alternative than drum-by-drum disposal.

NJDEP, Elizabeth, New Jersey -- continued

At this point, a plan was adopted to install an underground recovery system to prevent further contamination from materials migrating away from the contaminated area. This system effectively stopped the migration of contamination in all directions and decontaminated the subsurface area. Chemical concentration levels established by the NJDEP and the U.S. Coast Guard were met for groundwater removed and treated by the underground recovery and treatment system.

Prior to the installation of monitoring wells for the testing of groundwater contamination, all surface contamination including drums and tanks was removed from the site. Soil borings were obtained and analyzed to determine the contamination of subsurface soil.

Based on well monitoring and soil boring data, a recovery system was designed and installed on the site to treat volatile organics, PCBs, and various toxic materials.

The system consisted of numerous recovery points connected to header systems across the site. Volatile organics from recovered water that was preheated in a closed system were stripped and adsorbed onto vapor phase carbon. The water was then pumped through a clarifier for pH adjustment and flocculant addition. Upon leaving the clarifier, the pH of the water was readjusted and the water was pumped through a mixed media prefilter. Carbon filtration was utilized as a final treatment step. Over five million gallons of water were treated at this site.

Due to the scope of work and emergency nature of this project, work continued for approximately one year in order to complete all of the phases described. This project was estimated by NJDEP to take two years to complete.

Project Title: Hazardous Waste Site Cleanup (Valley of the Drums)

Client: EPA Region IV

In March of 1979, O.H. Materials Co. was called by the United States Environmental Protection Agency, Region IV, to respond to a spill incident that resulted from solvents leaking from rusted drums that had been landfilled at the Valley of the Drums in Shepherdsville, Kentucky. OHM responded to the spill with men and material from its home office in Findlay, Ohio, and its Regional Office in Atlanta, Georgia.

The first step was to contain the leaking solvents. This was done by digging a trench around the landfill and digging sump holes in the area of the spill. Exposed drums were covered with visqueen plastic for protection from the rain. To prevent flooding, OHM's personnel wearing acid suits used two custom-built, 1,500-gallon skid-mounted vacuum units to pump liquid from the trench and sumps.

The second step was to remove the solvent from the site. Vacuum units transferred the solvents from barrels to a 10,000-gallon holding tank brought to the site and set up by OHM. A local solvent recycler then hauled the material from the site.

The final step was to crush and dispose properly of the empty barrels and to restore the site. The job was successfully accomplished in three weeks.

In September of 1981, O.H. Materials was requested by EPA Region IV to return to the Valley of the Drums site in order to continue cleanup operations.

Initially, crews equipped with protective clothing removed the overburden which included brush and dead trees to allow access to the drums. Next, teams of sampling technicians extracted samples for analysis from approximately 4,000 drums containing liquid materials. Heavy equipment, including frontend loaders and a trackhoe with a barrel grappler attachment, was then used to stage the liquid-containing drums in one area and the solids-containing drums in another area.

The liquid drums were sampled to identify compatible materials. Analyses were performed in a mobile laboratory located on site. Compatible liquids were bulked in an OHM designed and fabricated "Compatibility Chamber" and the drums set aside for processing. The liquids were picked up by licensed chemical tanker trucks for transport to an authorized disposal facility. The remaining solid materials were bulk-loaded into specially equipped trucks for transport to a disposal site.

EPA Region IV -- continued

During the course of the project, a team of technicians expanded an existing on-site water treatment facility to allow for treatment of contaminated surface and groundwater. All empty drums were crushed by heavy equipment and hauled to an authorized disposal site. After the removal of all the hazardous materials and containers from the site, a restoration phase was initiated, including final grading and contouring of all affected work areas.

Project Title: Cleanup, Disposal, and Water Treatment of Waste Site at Goose Farm, Plumsted, New Jersey

Client: New Jersey Department of Environmental Protection

This abandoned waste site contained 5,000 buried drums of unknown chemicals and lab packs. Lab packs were sorted and repackaged and drums were excavated, categorized and tested for compatibility prior to disposal.

The installation of monitoring wells was instrumental in the determination of groundwater contamination. Well monitoring data was used to define the extent of the contamination as well as design a recovery system.

Two separate recovery systems were installed on the site. In order to confine additional groundwater from contamination, a recovery system was installed to contain the groundwater plume. The excavated location that had undergone drum removal was chosen as the site for the second recovery system.

Both recovery systems utilized one treatment system that consisted of several modules. Recovered water was routed through a clarifier for the addition of a flocculant and pH adjustment. After clarification, water was pumped through a series of carbon filters and then released to the surrounding area of the recovery system for repeated treatment. Treatment for more than 7.7 million gallons of water was handled with the use of these two systems.

Project Title: Two Piggy-Back Trailers of Barreled Calcium Carbide

Client: Confidential

A potentially hazardous situation arose when tiered railroad cars derailed. One flatcar carried two semitrailers containing fifty-five-gallon drums of calcium carbide which reacts with H_2O to form explosive acetylene gas. The car was overturned leaving the trailers on their sides and heavily damaged.

O.H. Materials Co. (OHM) received the call about 12:00 noon on January 9, 1982. An initial response crew of six personnel arrived at 6:00 p.m. by corporate aircraft. The site, which was only accessible by train, was located in the mountains. The initial response crew contained the spill site and began planning further cleanup that had to be done.

Two OHM's semi's, one carrying a remote drum handler and one carrying a decontamination unit, arrived Sunday, January 10 at 5:00 a.m. The remote drum handler was loaded onto a flatbed rail car, and OHM's crews proceeded to the spill site via the rail car.

Since the derailed trailers were on their sides, the operator of the remote drum handler was unable to see inside the trailers; therefore, another member of the OHM's crew had to give the operator hand signals in order to remove the drums from the flatcar which had carried it to the site since there was not enough room to unload it.

As the drums were taken out of the trailers, they were staged on another flatcar. After all intact drums were removed, OHM's technicians shoveled the spilled product into new drums which were brought in by another OHM's semi. After all of the spilled product was recovered from the spill site, the contents of the damaged drums were transferred into new drums.

All of the new drums containing the recovered product were then loaded onto semi's and taken to the manufacturer for use. Over ninety-five percent of all the spilled calcium carbide was recovered and sent to the manufacturer for use.

The complete job was completed in six days.

Project Title: Excavation of Illegal Hazardous Waste Site

Client: Department of Environmental Quality & Eng., Commonwealth of Massachusetts

On Tuesday, verbal communication was given by the D.E.Q.E. that the contract was signed. The necessary support equipment was dispatched from Ohio. Three O.H. Materials Co.'s personnel were flown to the site to make necessary arrangements for the support equipment and to meet with the D.E.Q.E.'s personnel.

A hotel room was obtained and set up as the communication network until the necessary support equipment arrived on site.

OHM's personnel met with D.E.Q.E.'s personnel to discuss boundaries and history of the site.

All necessary support equipment arrived on site. Preliminary air monitoring was done. The area was fenced off and marked to protect the public and to protect against contamination being taken off site. Previous analysis of the soil and liquid samples taken from the test wells put in by the D.E.Q.E. were discussed.

Air monitoring points were set up to adapt to ambient air conditions for public protection.

An on-site analytical unit was set up for analysis for compatibility and disposal of hazardous waste.

A decontamination trailer was provided for personnel on site. The personnel's protective equipment used on site was broken down into three different zones: Zone I--(Clean Zone) hard hat, coveralls, and work boots; Zone II--(Warm Zone) hard hat w/face shield, half-face respirator, coveralls work boots, disposable suit, disposable booties, and sample gloves; and Zone III--(Hot Zone) coveralls, work boots, disposable booties, disposable suit, disposable hood, protective clothing, sample gloves, heavy work gloves, over boots, and S.C.B.A.

A Contingency plan was developed in case of an emergency. The proper authorities were notified and talked with about the contingency plan.

The entire area was fenced off and anyone entering the outer perimeter was directed to the office trailer were everyone signed in and out.

The excavation was done utilizing a 580 C case backhoe to uncover the drums. A 215 trackhoe w/360° grappler attachment was then used to pickup the drums. They were then placed in the front end of a 955 front end loader and were taken to a staging area. The drums were then punched with a non-sparking attachment for the 580 C case backhoe to be sampled. The drums were then sampled and analyzed for compatibility.

D.E.Q.E., Massachusetts -- continued

Since OHM's personnel do not talk to the news media, all news media were directed to the D.E.Q.E., O.S.C. for any questions pertaining to the site.

Several different disposal and transportation firms were contacted to get the best possible price. A bio-degradation program was discussed for the low level contaminated pile until PCB's were discovered.

The area was resampled and analyzed. Results showed that all gross contamination was removed.

The area that was excavated was regraded and grass seed was planted.

All equipment used during the excavation was decontaminated before leaving the site.

A final report was given to the D.E.Q.E. detailing the methods and rationale used on this job.

Project Titles: Containment of Drums Leaking Toxic Chemical Waste

Client: EPA, Region V

O.H. Materials Co. was contracted in March, 1980, by the United States Environmental Protection Agency, Region V to contain chemical waste which had been improperly disposed at a chemical processing facility in the State of Indiana. The result of this contract was an emergency action for partial containment and cleanup of the site. O.H. Materials Co. provided both engineering consultation and analytical services.

Hundreds of samples were collected from the ten-acre site. These samples were analyzed either at the site in OHM's mobile laboratory or in OHM's main laboratory in Findlay, Ohio. Analytical equipment used in the field included a Tracor Gas Chromatograph with a flame ionization detector (FID) and a Hall conductivity cell. Compounds identified included: butanol, cyclohexene, toluene, naphthalene, ethylbenzene, tetrachlorethene, etc.

Based upon results of analytical tests, O.H. Materials Co.'s personnel restaged and overpacked many of the leaking drums using proper protective equipment.

Project Title: Superfund Immediate Removal at Abandoned Chemical Factory

Client: USEPA, Region III, Philadelphia, Pennsylvania

Upon request of the Federal Environmental Protection Agency, O.H. Materials Co. crews mobilized to an abandoned chemical production plant, Drake Chemical, on March 5, 1982. The plant was considered to be a hazardous health threat to the town of Lockhaven, Pennsylvania due to the stored chemicals, ranging from anhydrous ammonia, and oleum, to TCPA.

On arrival at the plant, O.H. Materials personnel, and the EPA, completed a tour of the abandoned site, finding 30 large storage tanks of unknown contents, 42 reaction vessels, and over 1700 drums of unknown chemicals spread throughout the site which would have to be sampled, staged, and finally disposed of as soon as possible. In addition, crews located several potentially explosive gas cylinders and two open lined lagoons containing acid. The Drake Chemial laboratory which was on site also contained explosive and reactive substances, such as sodium picramate, chlorosulfonic acid, dinitrochlorobenzene, and several large containers of unknown solvents.

During the next several weeks, trained personnel sampled each of the 30 larger tanks, utilizing full protective clothing and self-contained breathing air. Samples from tanks suspected of containing cyanide were sent to the O.H. Materials main laboratory in Findlay, Ohio for analytical interpretation. Other samples were analyzed on site. Crews then proceeded to remove the contents of the tanks for treatment or disposal.

The next phase of the project consisted of the sampling, identifying, and staging of the 1700 unknown drums. Once the drums' contents had been identified by way of analytical work completed by O.H. Materials field sampling teams and project chemists on site, three large compatibility chambers were utilized for the bulking and disposal of the compatible liquids and solids.

Also during this time, the lab packing operation was completed prior to disposal of the chemicals and solvents left in the abandoned plant laboratory. Over 1,000 substances were identified, and repackaged in overpack drums for proper disposal.

Throughout the entire project, all personnel were protected by utilizing full protective clothing, self-contained breathing air, and when deemed necessary, manifold air supply systems. Air monitoring was recorded by the EPA and Technical Assistant Teams through the completion of the project.

Project Title: Transfer of Material and Cleanup of Waste Oil Reclamation Plant

Client: U.S. Coast Guard, Cordova, Alabama

A waste oil reclamation plant in Cordova, Alabama, had been accepting drums of waste solvents with explosive characteristics to operate their boiler. The drums had leaked resulting in contamination of the storage areas. O.H. Materials Co. (OHM) was contacted by the EPA Region IV to transfer the material and clean up the contaminated soil.

Special handling was necessary due to the explosive nature of the drums. Upon arrival, it was discovered that fifty percent of the 2,500 drums stockpiled were pressurized and could be expected to explode. Crews were outfitted in acid gear and appropriate respirators and used brass tools to reduce the possibility of ignition. Crews bulked the waste material and transferred it to new drums so proper disposal could be accomplished.

A material layer of clay close to the ground surface had prevented vertical migration of the spilled materials into the groundwater. This layer of contaminated soil was excavated and transported to an approved landfill. Over 2,500 drums and 500 cubic yards of contaminated soil were also safely removed and transported to the landfill. All potentially explosive material was secured without any incident.

The project was completed in less than three weeks at a cost of approximately $72,000, $7,000 under the project estimate.

Project Title: Abandoned Site Cleanup

Client: Metro-Dade County Transportation Authority

O.H. Materials Co. contracted with the Metro-Dade County Transportation Authority in Miami, Florida, to clean up surface and subsurface contamination at an abandoned drum recycling facility (Miami Drum Service) which threatened nearby groundwater supplies in the Biscayne Aquifer. The work consisted of removing several thousand exposed and buried drums and other surface debris, treating 650,000 gallons of contaminated groundwater, and excavating approximately 7,500 cubic yards of contaminated soils. Due to the nature of the previous site use, a variety of contaminants was present, including organics, heavy metals, and PCB's.

Upon the arrival of the necessary personnel and equipment, crews equipped with protective clothing and respirators began removing the surface debris, including drums, dead trees and stumps, three steel storage trailers, and metal and concrete structures. A mobile water filtration and treatment system was assembled on site to process the contaminated groundwater. Soil excavation proceeded based on results of a comprehensive sampling and analytical program carried out by a local laboratory. The groundwater level was approximately three feet below the surface; therefore, much of the excavation and soil removal operation had to be performed below the water level.

Contaminated groundwaters were treated to specified limits and all identified contaminated soils and debris were removed to an approved secure landfill. A crew of from eight to fifteen technicians worked for five weeks to complete the project in conformance with the client's tight timetable. The project was successfully accomplished within the time frame and budget agreed upon by the client and OHM.

Project Title: Chloroform Spill Cleanup

Client: Confidential

In August of 1980, O.H. Materials Co. was contacted to replace a contractor and clean up a spill of chloroform, a volatile carcinogen. The spill resulted from a train derailment in which two tank cars ruptured, spilling over 30,000 gallons of chloroform. To further complicate the situation, the spill area was located within a small middle American town. Due to the complex geology of the area, chloroform rapidly penetrated and percolated out of the railway embankment. Consequently, soil, groundwater and an adjacent creek were highly contaminated in a relatively short period of time.

In order to effectively remove the spilled material from the environment, a wide variety of recovery techniques were employed. French drains, pneumatic recovery systems and individual recovery wells were among the techniques employed. To remove chloroform from the recovered, contaminated water, a treatment system was designed and constructed that utilized volatile hydrocarbon stripping and activated carbon adsorption. Subsequent reinjection of the treated water was incorporated to flush remaining contaminants to the recovery system.

A mobile field laboratory was brought in to insure that the effluent water from the treatment facility was below the established discharge criteria of 100 parts per billion (wt/vol) of chloroform. The mobile field laboratory analyzed over 60,000 samples, including water, sludge and soil, through the course of the project. Also, air monitoring to insure that the atmosphere was safe for the residents was maintained throughout the course of the project.

Project Title: Groundwater Investigation and Cleanup of Acrylonitrile Transportation Accident

Client: Confidential

In January, 1979, a leaking tank car of acrylonitrile was discovered in a railroad yard in a large town in eastern Illinois. Subsequent cleaning and excavation operations at the site by OHM crews revealed a contaminated layer of perched groundwater within four feet of the ground surface. Analysis of the groundwater seeping into the initial excavation showed acrylonitrile concentrations in excess of 75%.

Immediately, OHM instituted the placement of a series of shallow wells to determine the lateral extent of the contaminant spread. After the area of contamination had been defined, an underground recovery system was installed to recover contaminated groundwater. When recovery volumes increased with the spring thaw, a treatment system including aeration, multimedia prefilter and activated carbon was installed on the site. The treated water was recirculated to flush contaminants to the recovery system.

After the contaminant concentration had been significantly reduced, biological media was introduced into the contaminated soil and groundwater areas to biodegrade the ACN in situ.

Groundwater recovered from the underground recovery system, monitor wells, and around the spill site was sampled and analyzed three times a week to enable OHM to determine the efficacy of the containment and remedial actions.

The total project duration was approximately eight months.

Project Title: Groundwater Treatment and Analysis of Trichloroethylene

Client: Confidential

Groundwater recovery wells revealed trichloroethylene concentrations of 1000-4000 ppb from an underground spill. To restore the groundwater to a suitable quality to be considered as a potable water source with TCE concentrations less than 10 ppb, OHM established a groundwater treatment and analysis program.

The first stage of pretreatment, supplied by the client, reduced the concentration of TCE in groundwater to a level less than 400 ppb.

OHM initially designed, installed, and operated a 500 gallon-per-minute treatment system to remove TCE from recovery water. Since October, 1981, the treatment system capacity has been increased to 1200 gallons per minute. The second stage of pretreatment included aeration and pH adjustment to reduce the concentration of trichloroethylene prior to adsorption onto activated granular carbon. Because over aeration of the water can drive out carbon dioxide from the water and cause pH and Langlier Index to increase, pressurized carbon dioxide was injected in-line between the aeration tank and the carbon adsorption units. This measure was vital in preventing scale formation from clogging the carbon filters.

OHM's main laboratory analyzed samples using GC/MS twice a week within a three-day turnaround to assure that the water had met the less than 1.5 ppb criterion.

Over 968 million gallons of groundwater have been treated over the past three years with an additional year anticipated to finish the project.

Project Title: Building Decontamination and Disposal of Stored Pesticides

Client: U.S. Environmental Protection Agency, Bay of St. Louis, Mississippi

EPA contracted with O.H. Materials Co. (OHM) for disposal of the pesticides remaining in a laboratory storeroom and an adjacent storage building of EPA's Pesticide Analysis Laboratory, which had been phased out of operation. OHM was requested to decontaminate the two buildings for possible future use.

The laboratory storeroom and storage building contained small bags and bottles of various pesticides. OHM's crews in protective clothing and respirators removed and drummed the bags and bottles. The inside walls of the building were then removed and packed in DOT-approved drums for disposal. Paint from the walls and tile from the floors were removed for disposal. All materials were prepared for shipment to a USEPA-approved secure landfill.

Decontamination of the buildings was accomplished with an alkaline penetrating detergent. After decontamination, all surfaces were sealed with an epoxy coating.

The estimated cost for the project was $65,000; the actual cost was $55,000. The project was completed ahead of schedule. At present, the decontaminated laboratory is being used as an office.

Project Title: Decontamination and Disposal of Chemical Facility

Client: Drexel Chemical, Memphis, Tennessee

A fire occurred at a Drexel Chemical facility which contained atrazine, EPN, parathion, methyl parathion, and other hazardous materials. As a result of the fire-fighting effort, over six million gallons of contaminated water were generated. In addition, the steel and block facility was contaminated by pesticides and pesticide residue which was distributed by soot, smoke, and fire water.

The entire manufacturing complex required decontamination, destruction, and disposal. All of this had to be accomplished without allowing uncontrolled release of the six million gallons of contaminated water, which could potentially cause a fish kill on the Mississippi River.

O.H. Materials Co.'s (OHM) personnel wearing protective clothing and respirators began treatment of the water and destruction of the building. Within two weeks, approximately six million gallons of water were treated and disposed of in accordance with USEPA guidelines. Within three weeks, all affected buildings were decontaminated (using a caustic wash), destroyed, and discarded in an approved landfill.

The entire project took three weeks to complete at a cost of less than $.Ø5 per gallon of contaminated water. This cost was twenty percent under the original estimate given the client.

Project Title: Cleanup of Contaminated Water and Soil Following Fire at a Chemical Warehouse

Client: Terminex International, Louisville, Kentucky

Following a fire at the Terminex International Warehouse in Louisville, Kentucky, O.H. Materials Co. (OHM) was contacted to recover and treat the water used to extinguish the fire. This water, which was spread around the site, was contaminated with quantities of chlordane, arsenic, cyanides, and many other hazardous substances. The soil surrounding the warehouse and the undamaged portion of the warehouse were also contaminated.

The contaminated water, approximately 200,000 gallons, had to be treated, and the contaminated soil and debris surrounding the warehouse removed. Also, the remaining undamaged portion of the warehouse had to be decontaminated. Due to the hazardous conditions, all personnel were equipped with protective clothing and self-contained breathing air.

The contaminated water was treated using mobile carbon filtration system. Contaminated soil was excavated and shipped to an approved landfill. The warehouse was decontaminated and a large volume of wash water treated to remove contaminants. Over eighty pesticides, fumicides, and herbicides were handled.

This emergency project was completed in four days at a cost of approximately $25,000. The original estimate was approximately $35,000.

Project Title: Delivery and Disposal of Truckload of White Phosphorus

Client: Fort A. P. Hill, Virginia

A truck carrying eighty-nine drums of white phosphorus suddenly caught fire near Harrisburg, Pennsylvania. Some of the drums eventually exploded. The drums were overpacked and loaded onto two forty-foot box trailers. At this point, the shipper and owner refused to take any further action.

O.H. Materials Co. (OHM) was called on to be part of the convoy escorting the drums from Hagerstown, Maryland to Fort A. P. Hill in Virginia in order to fight any fires or handle any potentially explosive condition. The damaged drums of white phosphorus were very unstable, causing an extremely dangerous situation.

The drums of white phosphorus had been damaged to an unknown extent by the fire, which had been smothered with sand. It was suspected that the explosions had occurred after the formulation of hydrogen and phosphine gases and phosphoric acid. There were two dangers: the possibility of an explosion and the resulting release of phosgene gas.

The convoy arrived safely at Fort A. P. Hill, and the two trailers were positioned by OHM's personnel about one mile from the demolition range. Wearing fire entry suits, OHM's personnel removed the drums from the box trailers, secured them to pallets, and transported them to the demolition range. An OHM's operator used an all-terrain forklift to position the drums one at a time on the demolition range. Army EOD's personnel set charges and exploded the drums of phosphorus. OHM consulted on all phases of this project, including convoy safety, fire protection, personnel safety, and environmental monitoring. The entire cargo was safely destroyed.

This project was completed in three weeks and the project cost was within the estimate given the client.

Project Title: Removal of Chemical Materials and Explosives From Abandoned Laboratory

Client: City of Lafayette, Lafayette, Indiana

In April of 1979, O.H. Materials Co. (OHM) was requested by the Mayor of Lafayette, Indiana, to respond to an emergency situation, involving the removal of deteriorated laboratory chemicals, military ordnance, and explosives from an abandoned laboratory in downtown Lafayette. The project included identification, handling, and segregation of unstable chemicals and explosives. The chemicals were to be inventoried and repackaged for disposal. The explosives were to be removed, transported to a local police range, and blown up by the U.S. Army Explosives Ordnance Disposal (EOD) Team.

The laboratory had not been used in eighteen years and had belonged to a college professor who had passed away. This professor had assisted the U.S. military in the development of new explosive compounds. Many of the compounds stored at the site were unknown and/or unmarked. Therefore, the potential for explosion, fire, or environmental risk was high.

The laboratory had been discovered when vandals attempted to set fire to the building. The Mayor of Lafayette had requested assistance from the military, and a U.S. Army Technical Escort Team entered the building, removed the blasting caps on the facility floor, and left. The Mayor then requested additional assistance from the U.S. Environmental Protection Agency in Chicago, Illinois, the U.S. Army, and OHM.

OHM and the U.S. Army EOD Team jointly developed a plan to enter the facility and identify, remove, and segregate the chemicals and explosive items. Thousands of vials, bottles, or packages of chemicals from four different countries were handled. Some of the chemicals had been manufactured in the late 19th century. Several hundred pounds of unstable items were removed, including hand grenades, land mines, blasting caps, black powder, dry picric acid, oil containers of ether, and chemicals used in the manufacturing of explosive items. The remainder of the chemicals were segregated into six categories and repackaged for disposal at an approved landfill.

The contents of the building were safely removed, appropriately discarded, and the building decontaminated. The U.S. Army EOD Team and Technical Escort Team burned or blew up the military ordnance or explosive items.

This project was completed in three days at a cost of approximately $18,000 which was twenty-five percent lower than the estimated cost.

Project Title: Detonation of Explosives, Peroxides and Oxidizers

Client: Confidential Client

Approximately twenty pounds of organic peroxides, flammable peroxide-forming materials, explosives, water reactives and oxidizers were safely segregated, packaged, and loaded onto an OHM bomb trailer. The materials were then transported to a specified detonation range. OHM explosive experts skillfully unloaded and detonated the hazardous materials at the range sites. This one-day project was successfully completed in a safe and cost effective manner.

ORIGINAL (Red)

Project Title: Decontamination of Tanks Containing Oil and Sludge Containing PCB's

Client: Rollins Environmental Services, Sharpstown, Maryland

O.H. Materials Co. (OHM) was subcontracted by Rollins Environmental Services to remove, transfer, and package oil and sludge containing PCB's from seven 15,000-gallon tanks. The PCB level had to be reduced below 50 ppm. The work area was adjacent to a river and public park, both of which received heavy public use.

The contaminated oil remaining in the tanks was transferred into fifty-five-gallon 17-H drums. The transfer of the high-viscosity oil required that a transfer trailer containing specialized pumping equipment be dispatched to the site. It was impossible to pump the sludge; therefore, a trough had to be fabricated, the sludge shoveled into it, and transferred into fifty-five-gallon drums for final disposition.

Residual oil films in the tanks were removed by flushing with diesel fuel. This procedure decontaminated the vessels below the 50 ppm range established by the EPA. Analyses were made by the EPA mobile laboratory. The waste produced from the decontamination phase was transferred into a tank truck for proper disposal. Throughout the project, personnel were physically protected by full protective suits and manifold breathing air systems. Coordination with several regulatory agencies, including the U.S. Coast Guard, EPA, and local government agencies, was maintained at all times.

All of the contaminated sludge and oil was removed and transferred into containers for safe storage and handling. Complete decontamination of the seven tanks was achieved without any threat to surrounding land, water, or residents of the area. All of the containers were shipped to Curtis Bay, Maryland, for disposal.

Not knowing the exact volumes of sludge and oil involved, an original cost estimate of $42,000 was made. The final cost was $55,000, and the project was completed within one week. The apparent overrun was due to a significant change in scope--specifically a larger volume of oil and sludge to be removed than was anticipated.

Project Title: Tertiary Treatment of Wastewater Treatment Plant Effluent for PCB's

Client: CONRAIL, Croton-on-the-Hudson, New York

The CONRAIL facility at Croton-on-the-Hudson, New York, had a problem with PCB's passing through the facility's wastewater treatment plant. The source of the problem was the engine repair building where dielectric fluids were drained or leaked from engines being repaired. In addition to removing PCB-contaminated sludge from sewer lines, wet wells, coagulation tanks, settling tanks, and a small lagoon, O.H. Materials Co. (OHM) was asked to provide tertiary treatment of wastewater treatment plant effluent to remove PCB's.

It was also necessary to assess contamination levels in the 100,000-square foot engine repair shop and adjacent track, as well as right-of-way areas. All areas showing concentrations of PCB's greater than 50 ppm had to be decontaminated with high pressure water lasers. The 100,000-gallon wet well, a collection point for all drainage and runoff from the facility, had to be drained, the sludge removed, and the entire wet well decontaminated with high pressure water lasers and degreasers. The influent into the wet well also had to be diverted. A 1,000,000-gallon overflow storage tank had to be tested, drained, and decontaminated. PCB-contaminated oil had to be removed from the wastewater lagoons. The secondary lagoon was drained and sludges removed, tested, and properly discarded. Permanent oil containment devices had to be constructed between the primary and secondary lagoons and continuous oil collection equipment installed.

A mobile laboratory with GC capabilities was utilized to provide rapid turnaround time on the large number of samples collected during this project. It was necessary to develop representative sampling methods for the various areas that were decontaminated. Additionally, all materials for disposal had to be tested to determine the proper disposal methods. The influent and effluent from the carbon filtration unit had to be monitored daily to ensure effluent guidelines were being met.

The decontamination work in the engine repair shop, the wet well, lagoon areas, and track areas required protective clothing and respiratory protection. The decontamination of the million-gallon overflow storage tank required protective clothing and self-contained breathing apparatus. In order to prepare the sludges for disposal, it was necessary to expand the efficiency and the size of the sludge drying beds at the wastewater treatment plant.

All decontamination and testing activities outlined in the project scope section were accomplished. Additionally, more than 3,100 drums of contaminated material were tested and properly packaged for disposal.

CONRAIL, Croton-on-the-Hudson -- continued

Tertiary treatment of the wastewater treatment plant effluent has continued. OHM has also decontaminated various modules of the wastewater treatment plant making it possible for the client to effect modifications to the plant.

The major decontamination and testing portions of the project were completed within four months. No cost estimates were given because the scope of the work changes continually throughout the project.

Project Title: Quanta Resources, Phase I, Sampling and Analytical Assessment

Client: City of New York, New York

The Quanta Resources facility in Long Island City, New York, was a waste oil reprocessing and distributing facility. Mismanagement of the facility led to the mixing of hazardous waste, such as PCBs, into the waste oil which was subsequently sold as boiler fuel to apartment complexes, etc. The facility was closed by the regulatory authorities and placed under receivership of the courts. Remaining at the facility upon closure was an estimated 500,000 gallons of waste oil contaminated with various toxic wastes. OHM was contracted by the New York City Department of Environmental Protection to conduct a sampling and analytical assessment of the facility and its contents.

Phase I of the Quanta Resources project consisted of sampling and analysis of the 106 tanks of various size on the site. Four matrices of waste consisting of oil, water, sludge, and solids were encountered in the tanks. Oil and water samples were collected by a bacon bomb sampler. This sampling device was used to collect specific layers found in the tanks. Sludge and solid samples were collected by the use of a device designed to remove a representative portion of these wastes without obtaining unwanted layers.

Strict safety protocols were implemented during the sample collection portion of the project. These protocols included the use of self-contained breathing apparatus, protective clothing, and harness while sampling tanks of questionable integrity and unknown content.

Samples collected were subjected to an array of analyses designed to delineate the waste streams on site. With the use of an on-site mobile laboratory, tank samples were screened for PCBs by gas chromatography; RCRA metals by atomic absorption spectrophotometer; flammability by flash point analysis; heat content by bomb colorimetry; sulfur and chlorine content by traditional quantitative analysis.

Following completion of the sampling and analysis programs, the following waste streams were identified:

1. Uncontaminated oil
2. PCB contaminated oil
3. PCB oil
4. Uncontaminated water
5. PCB contaminated water
6. Water contaminated with RCRA metals
7. Uncontaminated sludge
8. PCB contaminated sludge
9. Sludge contaminated with RCRA metals
10. Flammable sludge
11. Uncontaminated solids
12. Solids contaminated with RCRA metals

Project Title: Cleanup, Decontamination, and Disposal of PCBs from a Passenger Train Station

Client: Confidential

OHM was contracted by a major city in the northeastern section of the United States to decontaminate an underground train station. Thousands of feet of track beds had been contaminated with cooling oil that had leaked from electric trains. The PCB-ladden sludge material not only covered the track beds, but also had spread to all exposed surfaces such as ceilings, walls, columns, and platforms.

After the sludge material was transferred into DOT approved drums, a portable water treatment system consisting of a vacuum system, clarifier, carbon and sand filters, holding tanks, and a sludge drying bed was set up. High pressure water spray machines were used in the decontamination process. Rinse water was collected, filtered, sampled, and recirculated back to the pressure washers.

A strict safety plan which included air monitoring and plastic barriers separating the work zones from the rest of the station was implemented because the station was operational and open to the public.

Swab samples were taken from surfaces that had been cleaned and decontaminated to assure that the decontamination process had been successfully completed.

The project was completed in approximately fourteen weeks.

Project Title: Containment of Contaminated Water at a Chemical Plant

Client: Ashland Chemical, Calumet City, Illinois

An explosion and fire occurred at a chemical plant belonging to Ashland Chemical Co. As a result of the fire fighting effort, 100,000 gallons of water contaminated with phenol, acrylic compounds, and solvents were present in the facility.

The immediate concern was the potential release of contaminated water into the Little Calumet River, which flows adjacent to the facility. Ashland requested O.H. Materials Co. (OHM) to respond to this emergency.

Upon arrival, OHM's crews, wearing protective clothing and respiratory protection, constructed doorway dikes and plugged all possible water escape routes, including floor drains. Then the liquid was collected using vacuum equipment, transported to a holding pond, and treated using OHM's clarifiers and mobile carbon filtration units.

Completion of the project took two days at a cost of $ .28 per gallon which was within the project estimate.

Project Title: Collection of Contaminated Water and Decontamination of a Stream and Culvert

Client: Confidential Client, Niagara Falls, New York

This project consisted of damming a creek and treating the collected water, removing and dewatering sludges contaminated with benzene hexachloride (BHC) and polychlorinated biphenyls (PCB's) and decontaminating the bedrock in the stream bed and a bridge culvert. The area involved was approximately 35,000 square feet.

The creek was dammed at the upper and lower ends of the project area. The water within the contaminated zone between the dams was collected with a vacuum truck and processed through a mixed media sand filter to remove the particulates. Prior to discharge, the effluent was sampled and analyzed in an on-site mobile laboratory.

The contaminated silt was removed with front-end loaders and backhoe, and then dried in vacuum-assisted sludge beds that were constructed at the site. The stream bottom of fractured bedrock was then decontaminated with high pressure water. Personnel on the project were required to wear protective clothing; and, depending on the extent of contamination, positive pressure breathing air or full-face respirators.

All phases outlined in the project scope were achieved in a safe and satisfactory manner. Approximately 3,000 cubic yards of contaminated material were removed and transported to a disposal site. In excess of 150,000 gallons of contaminated water were treated.

The project was completed in twenty-one days, six days longer than anticipated. The project required more time and money than estimated due to an expended scope of work.

Project Title: Cleanup, Decontamination, and Disposal of Low Level Radiation

Client: State of Georgia

Luminous Processes Co., a defunct operating facility, had been in the business of painting luminous watch dials and clock faces for 26 years. OHM was contracted to cleanup, decontaminate, and dispose of building structures and soils contaminated with radium-226 and tritium.

Radiation Management Corp. performed subcontractor duties which included site monitoring, radiation safety programs, and detailed training course to all personnel involved with site mitigation. OHM personnel wore protective clothing, lapel air sampling devices, and were monitored for contamination. All air samples taken from personnel registered lower than the maximum permissible concentrations in air for radium-226 exposure to the general public. Radiation monitoring on site was double checked by the State of Georgia. All readings were consistent.

The scope of work included the excavation of 15,000 cubic feet of soil with backhoes and front-end loaders. Dust control methods were implemented to reduce the migration of radiation. OHM designed and fabricated a drum filling device to simultaneously fill three drums through an enclosed entry point. After contaminated soil had been removed, monitoring was used to assure complete removal of radiation.

Decontamination of the manufacturing building on site was accomplished by shoring the inside of the building, and removing duct work and interior walls.

All contaminated material was packaged in DOT 17H specification drums. Drums were washed, weighed, and swipe tested to ensure that the exteriors were free from contamination. Drummed material was transported to a USEPA-approved radiation disposal facility.

Project Title: Removal/Disposal of Radium-226

Client: Ohio State Board of Health

Approximately two hundred vials of radium-226 had been discovered bricked inside a residential barbecue pit. Upon investigation by the Ohio State Board of Health, a furnace, window fan, and an isolated area in the basement of the occupied dwelling were also found to be contaminated.

OHM personnel, donned with respirators, Tyvek suits, booties, gloves, and hoods used radiological survey equipment to survey the extent of the contamination. Visqueen barriers were secured around work areas. The barbecue pit was disassembled and 5-10 cubic feet of contaminated soil was excavated. The furnace, window fan, small amount of flooring, baseboard, etc., were removed from the basement in the house. All contaminated items were packaged and shipped to a USEPA-approved radiation disposal facility.

OHM successfully completed this project in four days.

Project Title: Biodegradation of Surface Oil Sludge

Client: Confidential

Biodegradation techniques were successfully used in the cost-effective cleanup of surface oil sludge in a four-million-gallon lagoon. The surface area of the lagoon approximated one acre. The oil in the lagoon was biodegraded within one year to meet the required State discharge limit of 15 ppm oil and grease for water in reserve pits at drilling locations.

Surface aerators were placed in the lagoon to provide both aeration and mixing. The lagoon was inoculated with selected strains of microbes. Inorganic nitrogen and phosphorus were added to supply the nutrients required to support an increased microbial population. Following the biodegradation of a hard waxy surface layer, the remaining oil in the surface oil sludge was emulsified to significantly increase the rate of biodegradation.

Throughout the project, OHM's Atlanta Division performed the sampling necessary to monitor the biological and chemical parameters within the lagoon. Samples collected from the lagoon were analyzed to enumerate the microbial population and to determine pH, inorganic N and P concentrations, DO concentration, water temperature, and oil sludge hydrocarbon content (i.e., alkanes, aromatics, and polar compounds). Interpretation and lagoon parameter modification based on the results of these analyses enabled oil biodegradation to proceed at a maximum rate throughout the project. The project was completed within the contract period.

Project Title: Cleanup of Chemical Leakage from Train Derailment

Client: L & N Railroad, Crestview, Florida

A critical situation arose following an L & N Railroad derailment involving twenty-two cars. The surrounding areas were evacuated due to the possibility of toxins in the air and heavy smoke from the leakage and fire. Major environmental hazards were posed when anhydrous ammonia and chlorine formed a vapor cloud over the site. Traces of phosgene, ammonia, and phenol were detected in the air by the Air Force monitoring team. O.H. Materials Co. (OHM) was contracted to respond to the scene for consultation with L & N Railroad officials and to patch the leaking cars.

A carbolic acid car was leaking and its contents flowing into the Yellow River thus creating an environmental emergency. An anhydrous ammonia car and chlorine car were also leaking. Also, an acetone car was on fire, creating a potentially explosive situation. These factors prevented cleanup operations from beginning.

A dike was constructed around the leaking cars to prevent the chemicals from spreading to additional areas. OHM's personnel provided support for the project by patching the anhydrous ammonia cars so that transfer of this material could be initiated. The leaking chlorine was neutralized with sodium hydroxide. Once the fire had been extinguished in the acetone car and the remaining cars transferred, removal of the damaged tankers was begun.

The tank cars which had derailed were removed from the area after the contents had been transferred. The evacuation was lifted after five days when levels of contaminants were considered safe.

In less than a week, the project was completed at a cost of $23,000.

Project Title: Cleanup Following Train Derailment--Rupture of Tank Cars Containing Dinitrotoluene

Client: CONRAIL, Lucas, Ohio

O.H. Materials Co. (OHM) was requested by CONRAIL to respond to a train derailment in Mansfield, Ohio, which had resulted in the rupturing of two tank cars of dinitrotoluene (DNT). To further complicate the situation, the DNT had solidified in the tank cars and along the right-of-way because the derailment occurred in the winter.

OHM was required to develop procedures and equipment to safely transfer the tank cars, package and dispose of the dinitrotoluene, and cut up the tank cars.

OHM's personnel, in protective clothing and self-contained breathing apparatus, thoroughly inspected each tank car and patched damaged areas where leakage could occur. Many of the tank cars' steam lines, originally used to heat the product for unloading, had been crushed by the derailment and had to be rebuilt. The tank cars were heated slowly by circulating hot water through the tank car coils. The DNT was heated to approximately 160° F, transferred into fifty-five gallon drums, and shipped to an approved disposal site.

Following the transfer, the contaminated soil was excavated and disposed in an approved facility. The tank cars were transferred to another location and eventually cut up for scrap.

A substantial part of the $407,000 project cost was related to the packaging, transportation, and disposal of the dinitrotoluene. The entire project was completed in less than one month.

7.0 PERSONNEL QUALIFICATIONS

This section outlines the qualifications and experience of the OHM personnel. Following are resumes of key personnel. In addition Table 7.0-1 displays the years of experience, hours of in-house training and number of projects in which each individual has participated. It should be noted that the average work week for field personnel is between 65 and 70 hours per week.

TABLE 7.0-1

NAME	TITLE	OH EXP.	# JOBS	TRNG. HRS.
SMITH, STEVE	GENERAL SUPERVISOR	4	77	1046
WARNER, WILLIAM	SUPERVISOR SAFETY/TRAINING	7	169	1827
BOES, JOHN	SITE SUPERVISOR	6	148	1568
COPUS, JOHN	SITE SUPERVISOR	9	193	2348
HASSAN, CRAIG	SITE SUPERVISOR	4	81	1043
REESE, LONNIE	SITE SUPERVISOR	4	112	1041
THOMPSON, WILLIAM	SITE SUPERVISOR	4	103	1048
COONS, PAUL	O.H. SHOP SUPERVISOR	6	172	1567
BRIGNER, STEPHEN	GENERAL FOREMAN	4	83	1041
HUNT,JR., CHARLES	GENERAL FOREMAN	1	21	264
JONES, PAUL	GENERAL FOREMAN	1	5	265
MEEKER, DAVID	GENERAL FOREMAN	3	31	788
MORROW, TIMOTHY	GENERAL FOREMAN	3	52	783
SMULLEN, THOMAS	GENERAL FOREMAN	2	36	527
STAUFFER, LLOYD	GENERAL FOREMAN	3	43	788
TOBIN, ALLEN	GENERAL FOREMAN	4	37	1043
TOEPPE, RICHARD	GENERAL FOREMAN	7	217	1824
TREECE, CHARLES	GENERAL FOREMAN	3	20	786
WARREN, THOMAS	GENERAL FOREMAN	3	68	788
DURBIN, TIMOTHY	FOREMAN	3	32	784
GAFFGA, LAWRENCE	FOREMAN	3	31	781
GAY, WALTER	FOREMAN	5	77	1304
GEISER, MICHAEL	FOREMAN	3	23	785
GUINN, JOSEPH	FOREMAN	3	29	780
HELLER, GARY	FOREMAN	3	37	788
HOLCOMB, FRANKLIN	FOREMAN	3	26	782
HORN, JAMES	FOREMAN	3	32	783
LAUREANO, ANJEL	FOREMAN	3	47	789
LEAVENS, JOHN	FOREMAN	3	23	781
LOPEZ, JERRY	FOREMAN	3	39	782
MILLER, MIKE	FOREMAN	4	65	1041
PATRICK, CHRISTOPHER	FOREMAN	3	39	786
ROBERTS, CLIFTON	FOREMAN	3	8	782
STYER, ROBERT	FOREMAN	3	21	781
WHITE, NEAL	FOREMAN	5	27	1300
GRANT, DAVID	TECHNICAL FOREMAN	3	29	786
ELZER, FRANK	SHOP FOREMAN	4	53	1045
DARNALL, JAMES	FET SUPERVISOR	4	60	1049
WITTER, CHRISTOPHER	FIELD ADMIN. SUPERVISOR	5	83	1301
ARCHINAL, SID	FET	3	30	782
BARSOTTI, MICHAEL	FET	.5	5	134
DRERUP, RUSSELL	FET	.5	2	132
ERICKSON, MARK	FET	.5	5	136
METZGER, LOWELL	FET	.5	2	139
RADER, JOE	FET	.5	4	130
TIDWELL, HEARN	FET	.5	3	131

PROFESSIONAL PROFILE

WALT C. STUDABAKER

TITLE

Director of Technical Services

EXPERTISE

Civil/Environmental/Sanitary Engineering; Emergency Spill Response; Project Development

EXPERIENCE

Responsible for the administration of projects and personnel within the Technical Services Department including Proposal Development, Project Engineering, Main Laboratory, and Field Analytical Services.

Previously administered environmental compliance, energy conservation, and diesel fuel management programs with associated budgets for a major railway company. Long-term experience in design, construction, and operation of pollution abatement facilities including wastewater treatment, hazardous waste management, and air and noise pollution control.

Extensive experience in derailment emergency response and spill cleanup operations. Also developed and administered environmental research programs for the Association of American Railroads.

EMPLOYMENT HISTORY

O.H. Materials Co., 1982 - Present

The A.T. & S.F. Railway Co., 1971 - 1981.

- Corporate Director of Environmental Quality, 1980 - 1981
- Environmental Engineering Advisor to AAR, 1979 - 1980
- Eastern Division Environmental Engineer, 1973 - 1979

ACADEMIC BACKGROUND

B.S., Civil Engineering, Purdue University, 1971

Special courses in hazardous materials spill control and hazardous waste management.

PROFESSIONAL REGISTRATION

Licensed Professional Sanitary Engineer

PROFESSIONAL AFFILIATIONS

The American Society of Civil Engineers

Water Pollution Control Federation

American Railway Engineering Association

American Society for Testing of Materials

PROFESSIONAL PROFILE

STEVE O. SMITH

TITLE Supervisor

EXPERTISE Supervision of spill response and site cleanup operations

EXPERIENCE

Supervised portions of the cleanup operations at the Chemical Control site in Elizabeth, New Jersey including handling of deteriorated containers of unstable chemicals, building demolition, and installation and maintenance of groundwater treatment systems.

Supervised the excavation of several thousand containers of unknown chemicals, compatibility testing, segregation of explosive items, and installation and maintenance of groundwater treatment system at a waste site in New Jersey.

Responsible for the decontamination of structures, facilities, work areas, and lagoons contaminated with polychlorinated biphenyls (PCB's) at a site in New York.

Supervised or participated in numerous other jobs dealing with hundred of different hazardous materials and involving operations such as soil removal, barrel recovery (excavation, staging, emptying, and crushing), waste water treatment, groundwater recovery and treatment, and tank decontamination.

Coordinated the removal and decontamination of process equipment with a chemical factory and partial removal and decontamination of the structure.

Supervised the neutralization of chemicals within tanks and the decontamination of tanks. Also managed the drum handling, staging, sampling, compatibility and ultimate disposal at an abandoned herbicide/pesticide plant.

EMPLOYMENT HISTORY O.H. Materials Co., 1979 - Present

EDUCATIONAL BACKGROUND

Ohio State Highway Patrol School, 1973

Signal Instruction School, Penn Central Railroad, 1968

Swanton High School, 1968

PROFESSIONAL PROFILE

JOHN R. HITCHINGS

TITLE

Environmental Specialist

EXPERTISE

Hazardous waste site assessment, spill mitigation methods development, project bid preparation

EXPERIENCE

Served as laboratory assistant for a stationary tank spill of pentachlorophenol and for methods research for bacteriological studies on a tank car derailment of orthochlorophenol

Participated on a team doing compound identification, toxicological research, compound compatibility research, and research for disposal options in the decontamination of a chemical warehouse after a fire

Directed air monitoring program and assisted in developing the methodology utilized for sampling and analytical techniques for a hazardous material cleanup resulting from seven derailed tank cars discharging different compounds

Developed numerous proposals and cost estimates for a variety of spill response and site clean-up projects

Researched and identified the source of arsenic contamination in a stream that caused the death of several cattle

Technical director on a spill response where over 500,000 gallons of contaminated water were treated on site and discharged

EMPLOYMENT HISTORY

O.H. Materials Co., 1980 - Present

Fostoria Country Club, Drainage and Irrigation Maintenance, 1973 - 1978

ACADEMIC BACKGROUND

B.S., Environmental Health, Wright State University (Magna Cum Laude), 1980

Associate of Science, Environmental Health, Hocking Technical College, 1977

State of Ohio, Certificate, Occupational Safety, 1977

PROFESSIONAL PROFILE

LONNIE E. REESE

TITLE

Supervisor

EXPERTISE

Heavy equipment operation, 5 years experience implementing OSHA regulations.

EXPERIENCE

Heavy equipment operator on numerous projects requiring the containment, treatment, excavation, and disposal of hazardous materials.

Supervision for projects dealing with a wide range of hazardous substances found at warehouse fires, transportation accidents, and underground recovery cleanups.

Responsible for the construction and operation of underground and surface water recovery and treatment systems.

Supervised heavy equipment operations at excavation and surface projects involving the handling of over 50,000 drums and in excess of 35,000 cubic yards of contaminated soil and debris.

Provided supervision for the mitigation of a warehouse fire which included salvage, repackaging and shipment of materials, decontamination, and disposal.

EDUCATIONAL BACKGROUND

Houston High School, 1963

Study of Construction Lasers, 1967 - 1968

Explosive Users Seminars, 1978

EMPLOYMENT HISTORY

O.H. Materials Co., 1979 - Present

Reese Excavating, owner/operator, 1976 - 1979

Braun Excavating, Project Superintendent, 1968 - 1976

Jeffrey's Construction Company, heavy equipment operator, 1965 - 1968

Family-owned business, equipment operator and carpenter, 1963 - 1965

PROFESSIONAL PROFILE

STEVEN C. DAY

TITLE

Acting Manager, Field Technical Services

EXPERTISE

Analytical Chemistry, Air Monitoring, Gas Chromatography, Atomic Absorption, Spectrophotometry

EXPERIENCE

Site analytical supervisor for identification and removal of hazardous chemicals and explosives from lab packs at an abandoned waste site.

Responsible for duties as site analytical supervisor for the recovery and on-site biodegradation of underground solvent contamination in groundwater.

Served as field analytical supervisor for the identification and removal of hazardous chemicals and explosives from several hundred lab packs.

Field analytical supervisor for the survey and sampling of 106 storage tanks of PCB contaminated oil, water, and sludge at the Quanta Resources hazardous waste site.

Maintained and operated water treatment system used for the removal of PCB and metal contaminants in tank flush water at Elizabeth, New Jersey.

Participated as analytical chemist performing on-site instrumental analyses at numerous hazardous waste sites.

Field chemist responsible for air monitoring and site safety consulting at a 20,000 gallon tetraethyllead spill.

EMPLOYMENT HISTORY

O.H. Materials Co., 1981 - Present

ACADEMIC BACKGROUND

B.A., Chemistry and Microbiology, Miami University, 1980

PROFESSIONAL AFFILIATIONS

American Chemical Society

PROFESSIONAL PROFILE

CAREY B. DANIEL

TITLE . Manager, Southeast Region/Operations

EXPERTISE Explosives Handling, Site Clean-up Operations

EXPERIENCE

Client contact/negotations to define environmental problems and to coordinate methods of mitigation within required guidelines.

Coordination of emergency response actions and decontamination services. Over 20 years of experience in the U.S. Army as an authority on explosives.

Supervised removal of drums and contaminated soil and the treatment of contaminated groundwater at an abandoned drum recycling facility.

Supervised the repair, neutralization and cleanup of spilled materials including a derailed tank car containing phosphorus trichloride.

Supervised and performed numerous operations dealing with the handling, removal, defusing and disposal of intact or leaking explosive devices and materials.

EMPLOYMENT HISTORY

O.H. Materials Co., 1980 - Present

U. S. Army, Sergeant First Class, 1962 - 1980; key assignments included: Explosive Ordnance Disposal (EOD) Supervisor, 1979 - 1980; Assistant Operations Sergeant, 1978 - 1979; Operations Sergeant, Nuclear Target Analysis, 1976 - 1978; EOD Sergeant, 1973 - 1975; EOD Instructor, 1970 - 1973; and numerous training duties, 1962 - 1970

EDUCATIONAL BACKGROUND

Engineering Technology, Radiation Physics and Innovative Explosive Devices, 1975

Ammunition Officer Correspondence Course, 1975

Explosive Ordnance Disposal Course - 1974
Joint Service School, EOD, 1970

PROFESSIONAL RESISTRATIONS & AFFILIATIONS

Active member of the International Association of Bomb Technicians and Investigators

Explosive License (Federal and Georgia)

PROFESSIONAL PROFILE

CRAIG A. HASSAN

TITLE Site Supervisor

EXPERTISE Spill Response, Site Cleanup, PCB Transformers

EXPERIENCE

Responsible for the supervision of recovery technicians, general job operations such as portable construction, test well installations, and carbon filters and enforcement of safety.

Supervision and participation on numerous projects dealing with the decontamination and disposal of transformers and capacitors.

Also experience in sampling and disposal of water, soil, oil, and sludge contaminated with PCBs.

Supervision of the installation and maintenance of groundwater treatment systems.

Supervised the decontamination of a train station, passenger loading platforms, work areas, etc., contaminated with PCBs.

Decontamination of electrical transformer, transformer room and classrooms at a high school.

Cleanup, decontamination, and water treatment of chemical facility following a fire and explosion.

Groundwater recovery and restoration of an aquifer contaminated by an accidental spill of organic chemicals.

EDUCATIONAL BACKGROUND Findlay High School, 1970

EMPLOYMENT HISTORY O.H. Materials Co., 1979 - present

PROFESSIONAL PROFILE

THOMAS J. SMULLEN

TITLE General Foreman/Operations

EXPERTISE Handling and Disposal of Explosives

EXPERIENCE Ten years of experience in the United States Army has included extensive training in the handling and disposal of explosives. As an EOD Sergeant, responsible for the rendering safe disposal of all explosive items in both military and civilian situations. Also trained and evaluated seven subordinate EOD detachments and trained local law enforcement agencies.

Additional duties included the control of classified material and providing technical advice and assistance to the Joint Services Tunnel Neutralization Team during tunnel cleaning operations.

Responsible for conducting platform and field EOD training and teaching classes on manufactured and improvised explosives and explosive devices to both military and civilian personnel. Assisted in the use and disposal of explosive items. Administrative duties included scheduling and establishing training programs.

EDUCATIONAL BACKGROUND Trinidad State Junior College, Colorado, one year forestry.

Military: Guided Missile Propellant and Explosive Course

Explosive Ordnance Disposal Phases 1-Chemical, 2-Conventional, 3-Nuclear

Advanced Explosive Ordnance Disposal Refresher

Advanced Noncommissioned Officer Course

Nuclear Accident Training Courses from 1973 to 1979 at Sandia Laboratories, Albuquerque, New Mexico; Nuclear Contamination Containment

EMPLOYMENT HISTORY O.H. Materials Co., 1981 - Present

United States Army, 1970 - 1980

PROFESSIONAL PROFILE

STEVEN L. BRIGNER

TITLE General Foreman

EXPERTISE Field Operations

EXPERIENCE

Participated in numerous projects dealing with hundreds of different hazardous materials involving soil removal, barrel recovery (excavations, staging, emptying and crushing), wastewater treatment, groundwater recovery/treatment and tank decontaminations.

Provided instruction and supervision for general job safety. Assisted in approach and costs for operations, disposal, personnel and equipment in developing proposals.

Also, duties have included cost accounting, record keeping, billing, and note taking.

Participated in performing decontamination operations at a pesticide warehouse including the handling, repackaging and disposal of materials as well as the dismantling of the facility.

Cleanup operations including drum handling, liquid solidification, drum crushing and removal.

Participated in cleanup of hazardous waste site which included handling of drums, excavation of contaminated soil, repacking of laboratory materials, and treatment of contaminated water.

Decontamination of structures, facilities, work areas, railroad tracks and lagoons contaminated with polychlorinated biphenols (PCBs).

Cleanup of chloroform including underground recovery/treatment, building construction, test well installation, sampling and disposal.

Numerous oil spill cleanups on rivers, ponds, and lakes using sorbents, booms, boats, and various vacuum equipment.

EMPLOYMENT HISTORY O.H. Materials Co., 1979 - Present

EDUCATIONAL BACKGROUND Fort Wayne International Business College, 2 years

PROFESSIONAL PROFILE

L. BRUCE ALLEN

TITLE

Project Manager

EXPERTISE

Supervision of hazardous material spill responses and site cleanup; hazardous waste regulations analysis

EXPERIENCE

Supervised projects involving emergency chemical spills cleanup, contaminated groundwater recovery and treatment, and oil spills

Established sampling programs and protocols

Assisted Chief Chemist in field laboratories

Prepared technical approach and cost estimates for active and proposed projects

Advised other managers on RCRA and DOT regulations

Performed as foreman on numerous projects

Designed and installed monitoring wells

Designed and tested sampling devices

Coordinated corporate records management and microfilm activities

EMPLOYMENT HISTORY

O.H. Materials Co., 1977 - Present

Self-employed remodeling contractor and restaurant manager, 1975 - 1977

EDUCATIONAL BACKGROUND

Engineering, Ohio State University, 1968 - 1970

Numerous training seminars in areas of gas chromatography, handling of toxic substances, transportation of hazardous materials, 1979 - 1981

CPR Instructor

First Aid

PROFESSIONAL PROFILE

TIM A. DURBIN

TITLE Foreman

EXPERTISE Underground recovery systems

EXPERIENCE Experience with oil spill mitigation, underground recovery systems and samling of hazardous materials. Participated in containment and cleanup of a variety of hazardous wastes, assembly of portable buildings, loading/unloading of equipment and general labor duties.

Sampling and cleanup of PCBs at hazardous waste site.

Assisted with underground recovery system for water contaminated with chloroform.

Centrifuged sludge samples representing various types of hazardous wastes.

Participated in cleanup of barrels and lab packs after a fire destroyed a chemical warehouse.

Helped to operate a water treatment system for the recovery of TCE from water.

Participated in numerous oil spill cleanups.

EMPLOYMENT HISTORY O.H. Materials Co., 1980 - present

ACADEMIC BACKGROUND Pike/Delta/York High School - 1978

PROFESSIONAL PROFILE

ROBERT J. BOURNE

TITLE Senior Project Control Technician

EXPERTISE Cost accounting, waste disposal, lab packs

EXPERIENCE

Responsible for project scheduling, waste disposal, record keeping management, and maintaining relations with state agencies.

Budgeting and cost control for projects dealing with federal/state environmental agencies and private corporations.

Cost projections, personnel safety coordination, providing accurate and current records for water treatment and waste removal/disposal.

Repacked and arranged lab packs for disposal, collected PCB oil samples, and aided with containment and cleanup of oil spills.

Participated in waste removal and water treatment after a fire destroyed a chemical warehouse.

Assisted with an engineering survey of contaminated sewers. Also sampling water and core samples at a hazardous waste site.

Operated groundwater treatment systems for the recovery of organic chemicals.

EMPLOYMENT HISTORY O.H. Materials Co., 1979 - Present

EDUCATIONAL BACKGROUND Ohio State University, Animal Science, 3 years

PROFESSIONAL PROFILE

PAUL G. WISEMAN

TITLE Project Chemist

EXPERTISE Analytical Chemistry, Site Assessment, Laboratory Management, and Quality Assurance

EXPERIENCE Instrumentation experience included the gas chromatograph and detectors such as ECD, HECD, FPD, FID, and AFD and the analysis of RCRA and priority pollutant metals using atomic absorption.

Responsible for sample preparation analysis for polychlorinated biphenyls (PCBs) in air, water, concrete, soil, food, and surfaces; hexamethylphosphoramide, phenols, volatile organics, pesticides, aromatics, and total organic carbon.

Waste characterization duties included compatibility testing for categorization of unknown drum waste, lab pack segregation for the identification, segregation and disposal of laboratory waste, and the adherence to RCRA methods for hazardous waste disposal.

Performed site assessments to determine the nature and extent of contamination in various matrices. Designed and set up air monitoring programs using state-of-the-art equipment. Also instituted sampling programs for the analysis of surface and subsurface soil, groundwater, building structures and surfaces.

Responsible for maintaining quality control in field analytical sampling projects. Coauthor of O.H. Materials' Quality Assurance Manual. Other duties have included the management of personnel and laboratories in the field and performing as a technical liaison between project supervisors and government officials.

EMPLOYMENT HISTORY O.H. Materials Co., 1980 - Present

Northern Michigan University, Research Assistant in Organic Chemistry, 1980

ACADEMIC BACKGROUND B.S., Chemistry/Biology, Northern Michigan University, 1980

PROFESSIONAL AFFILIATIONS American Chemical Society

NAME	TITLE	OH EXP.	# JOBS	TRNG. HRS.
ALLIMAN, MARK	PCT	2	17	521
BOURNE, ROBERT	PCT	4	86	1049
HEIZMAN, SCOTT	PCT	.5	2	137
HESSE, ROBERT	PCT	2	21	520
PRICE, TONY	PCT	.5	2	139
WEBER, ROBERT	PCT	4	75	1049
BARBOUR, CARL	LEAD RECOVERY TECHNICIAN	1	10	263
CARSON, JR., JOHN	LEAD RECOVERY TECHNICIAN	3	28	783
CLAYBAUGH, JEFFERY	LEAD RECOVERY TECHNICIAN	3	22	785
FRANTZ, WILLIAM	LEAD RECOVERY TECHNICIAN	3	41	780
GRAZIANO,JR., ROBERT	LEAD RECOVERY TECHNICIAN	2	12	528
MICHEL, KEVIN	LEAD RECOVERY TECHNICIAN	2	22	520
MORROW, GEORGE	LEAD RECOVERY TECHNICIAN	2	30	522
OGG, RICHARD	LEAD RECOVERY TECHNICIAN	3	49	785
ROMICK, DAVID	LEAD RECOVERY TECHNICIAN	3	28	783
STREET, PAUL	LEAD RECOVERY TECHNICIAN	3	31	780
THRUSH, RODNEY	LEAD RECOVERY TECHNICIAN	2	32	520
TIELL, BRIAN	LEAD RECOVERY TECHNICIAN	2	21	262
BAYES, CHRIS	RECOVERY TECHNICIAN	1	11	265
BRYAN, JEFFREY	RECOVERY TECHNICIAN	.5	6	132
CHRISTENSEN, WAYNE	RECOVERY TECHNICIAN	.5	3	134
COLLINS, ROBERT	RECOVERY TECHNICIAN	1	1	266
DAVENPORT, DENACE	RECOVERY TECHNICIAN	5	93	1300
DROLL, TODD	RECOVERY TECHNICIAN	.5	2	133
FELTON, DANIEL	RECOVERY TECHNICIAN	1	9	267
FLECK, JAMES	RECOVERY TECHNICIAN	.5	2	138
FOREMAN, MICHAEL	RECOVERY TECHNICIAN	2	13	529
GARRETT, GREGORY	RECOVERY TECHNICIAN	3	29	782
GRANT, RICHARD	RECOVERY TECHNICIAN	.5	3	137
GREER, MARK	RECOVERY TECHNICIAN	1	2	269
HAAG, BRUCE	RECOVERY TECHNICIAN	.5	1	134
HALL, GREGORY	RECOVERY TECHNICIAN	.5	2	132
HATLAY, GARY	RECOVERY TECHNICIAN	.5	2	134
HEFFELFINGER, CHARLES	RECOVERY TECHNICIAN	1	3	265
HEILMAN, JOSEPH	RECOVERY TECHNICIAN	.5	1	136
HENDERSON, TIMOTHY	RECOVERY TECHNICIAN	1	7	269
HINDS, MICHAEL	RECOVERY TECHNICIAN	.5	2	131
KAIN, DONALD	RECOVERY TECHNICIAN	.5	1	136
KELBLEY, DENNIS	RECOVERY TECHNICIAN	1	5	267
KLOEPFER, ROGER	RECOVERY TECHNICIAN	1	4	268
LAUREANO,JR., WILLIAM	RECOVERY TECHNICIAN	1	6	260
LOUGHE, THERON	RECOVERY TECHNICIAN	2	16	523
MALONE, JOHN	RECOVERY TECHNICIAN	.5	2	134
MARQUART, STEVEN	RECOVERY TECHNICIAN	.5	1	135
MAY, DAVID	RECOVERY TECHNICIAN	.5	2	137
NIESE, CHARLES	RECOVERY TECHNICIAN	.5	2	134
POOL, STEVEN	RECOVERY TECHNICIAN	.5	3	138
RUCKER, CHARLES	RECOVERY TECHNICIAN	1	4	264
SCHEIBER, ROBERT	RECOVERY TECHNICIAN	.5	1	135
STRAND, MICHAEL	RECOVERY TECHNICIAN	.5	1	139
SWARTZLANDER, WILLIAM	RECOVERY TECHNICIAN	1	4	262
TANNER, ALLEYN	RECOVERY TECHNICIAN	2	20	523

NAME	TITLE	OH EXP.	# JOBS	TRNG. HRS.
TATE, RICHARD	RECOVERY TECHNICIAN	.5	1	134
THEIS, ED	RECOVERY TECHNICIAN	.5	2	135
THERRIAULT, PATRICK	RECOVERY TECHNICIAN	1	3	266
THIEL, KIM	RECOVERY TECHNICIAN	.5	1	137
TRAXLER, RODNEY	RECOVERY TECHNICIAN	1	5	265
WITTER, PHILLIP	RECOVERY TECHNICIAN	1	5	262

PROFESSIONAL PROFILE

JOSEPH R. KIRK

TITLE

Executive Vice President, Operations

EXPERTISE

Construction Management, Specialized Equipment Design, Management of Spill Response and Site Cleanup Operations

EXPERIENCE

Managed over five hundred emergency response and long-term decontamination projects over a ten-year period, including abandoned hazardous waste sites, train derailments, building demolition, and contaminated groundwater systems

Designed and developed specialized materials handling and processing equipment for use in spill response and site cleanup operations--six patents pending

Overall responsibility for maintaining OHM's fleet of response equipment, design, and fabrication of prototype processing equipment, preparation of cost estimates, and scheduling of personnel and equipment for ongoing projects

Managed the construction of two water treatment facilities and designed and built carbon filters.

Developed procedures to decontaminate and detonate warfare agents. Also, extensive experience in stabilizing extremely hazardous situations.

EMPLOYMENT HISTORY

O.H. Materials Co., 1969 - Present

EDUCATIONAL BACKGROUND

Structural Engineering, University of Toledo, 1970 - 1973

Construction Technology, Ohio State University, 1973

Numerous Training Courses, Workshops, and Seminars

PROFESSIONAL PROFILE

ROBERT H. PANNING

TITLE

Vice-President, Project Development

EXPERTISE

Supervision of hazardous material spill responses and site cleanup, project management

EXPERIENCE

Involved in both project and logistics management on over three hundred incidents involving hazardous materials handling; the decontamination or demolition of vessels, structures, or facilities; and the detoxifiction or removal of contaminated soils and water.

Responsible for overall management of O.H. Materials Co.'s ongoing work. Duties include the participation in proposal development, project initiation, contract negotiations and modifications, and the monitoring of the progress of long-term projects. Also the liaison to numerous governmental agencies regarding specific projects.

Supervised containment and cleanup operations at several train derailments involving ruptured cars of epichlorohydrin, acrylonitrile, hydrocyanic acid, propylene, and lube oil.

Supervised the processing, treatment, and removal of wastes at numerous contaminated waste sites involving drum and soil excavation, drum handling, liquid waste treatment, and groundwater treatment.

EMPLOYMENT HISTORY

O.H. Materials Co., 1977 - Present

Penn Central Transportation Company, 1974 - 1977

Ohio State University, Research Assistant, 1973 - 1974

ACADEMIC BACKGROUND

B.A., Political Science, Ohio State University, 1973

Numerous workshops, seminars, and training sessions on hazardous material incident response and government contracting procedures

PROFESSIONAL PROFILE

WILLIAM F. WARNER

TITLE

Safety Supervisor

EXPERTISE

Responsible for implementation of OSHA regulations and project safety for all job sites. Three years of experience in the implementation of OSHA regulations.

EXPERIENCE

Responsible for the evaluation of personal protective equipment and training of field personnel in all aspects of safety.

Instrumental in the development of general safety policies, a medical surveillance program, a fleet safety program, and decontamination trailers for field projects.

Assisted a manufacturer of air filtering respirators in the development of a new face piece. Also responsible for assisting in the development of a NIOSH worker bulletin on hazardous waste.

EMPLOYMENT HISTORY

O.H. Materials Co., 1977 - Present

KBI Construction Co., 1977 - 1979

Dukes Construction Co., 1974 - 1977

EDUCATIONAL BACKGROUND

Occupational Safety - National Safety Council

Safety Training Methods - NSC

Safety Management - NSC

Emergency Response Training - EPA

First Aid Instructor - CPR

Findlay High School, 1971

AFFILIATIONS

National Safety Council

National Environmental Training Association

American Society of Safety Engineers (ASSE)

PROFESSIONAL PROFILE

SAMUEL E. INSALACO

TITLE

Manager, Technicial Development

EXPERTISE

Environmental Chemistry, Aquatic Ecology

EXPERIENCE

Experience with technical project management for numerous projects dealing with a broad range of hazardous materials.

Designed and implemented ambient air monitoring program, sampling programs, for soil and water, and site safety programs for numerous projects.

Formerly responsible for a fleet of mobile field laboratories and a staff of chemists performing sample preparation and on-site analyses which included atomic absorption (AA), gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS). Also supervised the training for field chemists.

EMPLOYMENT HISTORY

O.H. Materials Co., 1980 - Present

New York State Health Department, Mass Spectrometry Laboratory, Laboratory Manager, 1979 - 1980

United States Army Corps of Engineers, Research Assistant, 1978 - 1979

Union Carbide, Linde Division, Research Assistant, 1975 - 1977

ACADEMIC BACKGROUND

M.S., Environmental Chemistry/Aquatic Ecology, State University of New York, 1979

B.S., Biology/Chemistry, State University of New York, 1975

PROFESSIONAL AFFILIATIONS

American Society of Mass Spectrometry
American Chemical Society
Association of Official Analytical Chemists
Society of Environmental Toxicology and Chemistry

SELECTED PUBLICATIONS

Numerous publications in the areas of chemistry, aquatic toxicology and limnology

PROFESSIONAL PROFILE

ROBERT M. GRAZIANO

TITLE	Vice President, Business Development
EXPERTISE	Marketing, Hazardous Materials Transportation
EXPERIENCE	Provided technical assistance to the L & N Railroad and SCL Industries concerning propane tank car derailment
	Coordinated the development and presentation of technical report to the U. S. EPA and the Love Canal Homeowners' Association
	Supervised and provided technical assistance necessary to repair 78 defective rail tank cars loaded with flammable gas
	As Director of the Bureau of Explosives, was responsible for development and implementation of the Rail Transport Industry's hazardous Materials Program
EMPLOYMENT HISTORY	O.H. Materials Co., 1979 - Present
	Association of American Railroads, Washington D.C., Director of the Bureau of Explosives, 1970 - 1979
	Bureau of Explosives, Field Inspector, 1969 - 1970
EDUCATIONAL BACKGROUND	Business and Social Sciences, Villanova University, 1958 - 1960
	Academy of Advanced Traffic, 1968 - 1969
PROFESSIONAL AFFILIATIONS	Hazardous Materials Advisory Committee, Chairman, 1975 - 1976; Executive Committee, 1974 - 1979
	National Academy of Sciences Committee A3C1D
	National Defense Transport Association
	National Solid Waste Management Association
SELECTED PUBLICATIONS	Emergency Response to Hazardous Materials Incidents with Surface Transportation - 1978
	Hazardous Materials Regulations Tariff - 1970 through 1979

PROFESSIONAL PROFILE

LINDA D. ABRAMS

TITLE	GC/MS Project Chemist
EXPERTISE	Gas Chromatograph/Mass Spectrometry, Gas Chromatography, Liquid Chromatography
EXPERIENCE	Operation of a Finnigan 1020 and a Finnigan 4000 GC/MS including SIM and LC/MS. Performs maintenance and troubleshooting on these systems. Operation of a Finnigan OWA 30 GC/MS including maintenace and troubleshooting. Perform analysis on enviromental samples using capillary and packed chromatography. Operation of Tracor and Hewlett-Packard gas chromatographs equipped with ECD and HECD detectors. Operation of a Dohrmann Model DX-20 TOX analyzer for total organic halides.
EMPLOYMENT HISTORY	O.H. Materials Co., 1981 - Present Advanced Environmental Systems, Inc., 1980 - 1981 Great Lakes Laboratory, 1975 - 1980
ACADEMIC BACKGROUND	B.A. Chemistry, State University College at Buffalo, 1979
AFFILIATIONS	American Chemical Society
SELECTED PUBLICATIONS	Dahlgran, J.D., Abrams, L.D., "Investigation into the Analysis of Complex Environmental Samples Employing Fused Silica Capillary Columns," submitted to: Journal of High Resolution Chromatography and Chromatography Communications. Levine, S.P., Skewes, L.M., Abrams, L.D., Palmer, A.G. III, "High Performance Semi-preparative Liquid Chromatography and Liquid Chromatography-Mass Spectrometry of Diesel Engine Emission Particulate Extracts," Proceedings of 6th International Symposium on Polynuclear Aromatic Hydrocarbons, 10/81.

PROFESSIONAL PROFILE

GUNARS J. ZIKMANIS

TITLE

Supervisor - Organic Chemistry Laboratory

EXPERTISE

Organic/Analytical Chemistry, and Gas Chromatography

EXPERIENCE

Responsible for supervision of lab technicians and chemists performing organic extractions and sample preparation in the main chemistry laboratory. Maintenance of lab equipment, insuring adherence to safety protocols and ordering glassware and other laboratory supplies.

Supervised and performed analysis for PCB's, herbicides, pesticides, phenols, priority pollutants, oil/grease, E.P. Toxicity, etc., for water, soil, sludge, oil, and swab samples. Preparation of stock and standard solutions and maintenance of record keeping data for quality control.

Researched and implemented problem-solving techniques for herbicide extraction procedure. Responsible for overseeing the logging, tracking, and turnaround time for samples. Maintained strict accordance to state/federal regulations for sample disposal.

EMPLOYMENT HISTORY

O.H. Materials Co., 1980 - Present

Clark Oil & Chemical Co., Chemist, 1978 - 1980

Ohio State Veterinary Clinic, Laboratory Technician II, 1975 - 1980

ACADEMIC BACKGROUND

B.S., Chemistry, (with ACS certification), Cleveland State University, 1977

AFFILIATIONS

American Chemical Society

American Society for Testing of Materials

PROFESSIONAL PROFILE

PAUL E. FLATHMAN

TITLE

Manager of Biotechnology

EXPERTISE

Biology, Microbiology

EXPERIENCE

Responsible for client negotiations and startup of biodegradation project that treated a four million gallon lagoon of surface oil sludge. Also sampled, enumerated microbial populations using standard plate count techniques, determined pH, and quantified inorganic nutrient concentrations spectrophotometrically. The oil in the lagoon was successfully biodegraded over a one-year time span to meet the discharge limit of 15 ppm for reserve pits at drilling locations.

Responsible for the biodegradation feasibility study for the cleanup of five organic solvents in contaminated soil water. Monitored the biological parameters and analyzed all data. Soil water with initial concentrations of 3500 ppm tetrahydrofuran were reduced by 98 percent in 30 days.

EDUCATIONAL BACKGROUND

M.S., Microbiology, Bowling Green State University, 1974

B.S., Biology/Chemistry, Defiance College, 1963

Registered Microbiologist with American Academy of Microbiology

Numerous continuing education courses in applied microbiology

EMPLOYMENT BACKGROUND

O.H. Materials Co., 1980 - Present

Aqua Tech Environmental Consultants, Inc., Chief, Chemistry and Microbiology, 1980

Heidelberg College, Microbiologist, 1978 - 1980

Defiance City Schools, Science Instructor, 1965 - 1978

PROFESSIONAL AFFILIATIONS

American Society of Microbiology
Society for Industrial Microbiology
American Chemical Society
American Society for Testing and Materials
Water Pollution Control Federation

PUBLICATIONS

Several microbiology publications

PROFESSIONAL PROFILE

CYNTHIA A. STEMPNIAK

TITLE Main Lab Chemist

EXPERTISE Instrumentation, Analytical Chemistry

EXPERIENCE Responsible for the maintenance and operation of the following equipment:

Gas chromatography/mass spectrometer, atomic absorption spectrophotometer, liquid chromatograph, ultracentrifuge, chloridometer, gas chromatograph and computer.

Experience in hiring, training and supervising technical personnel. Directed laboratory operations such as inventory control, computer programming, data interpretation, report generation, and ordering supplies.

Also prepared, split, coded, inventoried, and distributed incoming samples. Set up and demonstrated laboratory classes for Water and Sewage Treatment courses sponsored by the New York State Dept. of Environmental Conservation.

EMPLOYMENT HISTORY O.H. Materials Co., 1983 - Present

State of New York - Research Institute on Alcoholism, 1981 - 1983, Assistant Research Scientist/ Chemist

Great Lakes Laboratory, 1978 - 1981, Research Associate/Chemist

ACADEMIC BACKGROUND B.A. Chemistry, State University College of New York

A.A.S. Chemicial Technology, Erie Community College

PROFESSIONAL REGISTRATIONS & AFFILIATIONS American Chemical Society

International Association for Great Lakes Research

Successly completed numerous courses in water treatment and instrumentation. Also co-authored a paper entitled "The Spatial Distribution of Nutrient Concentrations in Buffalo Harbor, Buffalo, NY".

PROFESSIONAL PROFILE

BENJAMIN I. SHAPRIO

TITLE Main Lab Chemist

EXPERTISE Analytical Chemistry

EXPERIENCE Duties include sample preparation for PCBs, cyanides, EP toxicity extractions and RCRA analysis. Also, experience with metal analysis using the atomic absorption spectrophotometer.

Experience with organic separation, trace analysis, electrochemistry, gas/liquid chromotography and the handling and preparation of biological samples and toxic compounds.

Responsibilities as college instructor included the teaching of courses in analytical and general chemistry. As a research and teaching assistant, research consisted of developing an analytical method for the quantitative determination of nitrosamines in biological matrices.

EMPLOYMENT HISTORY O.H. Materials Co., 1983 - Present

Temple University, 1980 - 1983, Instructor; Research Teaching Assistant

ACADEMIC BACKGROUND M.A. Analytical Chemistry, Temple University, Graduate School, 1982

B.S. Chemistry, Rutgers University, 1979

B.S. Biology, Ursinus College, 1978

PROFESSIONAL AFFILIATIONS American Chemical Society

PROFESSIONAL PROFILE

JAMES P. DARNALL

TITLE Group Supervisor, Field Engineering Technician

EXPERTISE Groundwater monitoring, biodegradation, gas/liquid/solid sampling

EXPERIENCE Program supervision for a variety of projects including groundwater recovery and biodegradation.

Responsible for setup, assessment, and troubleshooting of water treatment systems.

Implementation and coordination of soil/groundwater sampling programs, supervision of technical services personnel and experience in air monitoring.

Responsible for maintaining accurate documentation of site activities, sampling logging and preservation and chain-of-custody for sampling.

Scope of experience is reflected in a few chosen projects:

- sampling of arsenic spill
- chloroform sampling of highly contaminated soil, surface water and groundwater
- soil, water, swab sampling of PCBs
- soil boring and groundwater sampling for chlorinated solvents

EMPLOYMENT HISTORY O.H. Materials Co., 1979 - Present

ACADEMIC BACKGROUND B.A., Political Science/History, Bowling Green State University, 1975

PROFESSIONAL AFFILIATIONS National Water Well Association

PROFESSIONAL PROFILE

JOSEPH J. VONDRICK

TITLE Field Project Chemist

EXPERTISE Analytical/Environmental Chemistry

EXPERIENCE

Performed numerous specialized analytical procedures including qualitative and quantitative gas chromatography analysis, organic carbon, and PCB analysis.

Supervised and performed numerous field sampling, analytical procedures, and air monitoring operation.

Supervision of field lab and air monitoring program. GC analysis and assistance in setting up water treatment system for chloroform.

Supervision of field lab with extensive groundwater monitoring and analysis for PCBs and organics.

Developed total organic halide analysis procedure. Tested drums for compatibility analysis--corrosiveness, reactivity, ignitability, toxicity, and PCBs.

Responsible for wastewater treatment and centrifuging samples. Also, analyzed water and sludge samples for metals and organics by using GC and AA analysis.

Sorting, repacking, arrangement for disposal of lab packs after a stockroom fire.

Nutrient analysis on Hach spectrophotometer for PO_4 and NH_4. Also sampling, GC analysis and quality control for testing of organics.

EDUCATIONAL BACKGROUND B.S., Chemistry (with ACS certification), Baldwin-Wallace College, 1978

EMPLOYMENT HISTORY O.H. Materials Co., 1980 - present

Lake County Government, Chemist, 1976 - 1980

PROFESSIONAL AFFILIATIONS American Chemical Society

Class III Operator's License (Wastewater Treatment)

PROFESSIONAL PROFILE

JAMES R. JOICE

TITLE Field Project Chemist

EXPERTISE Analytical/environmental chemistry, water treatment, and quality assurance

EXPERIENCE Responsible for the safe execution of air monitoring, sampling, and analysis of various hazardous substances in all sample matrices. Participated in several projects involving the reclassification and repackaging of lab packs. Also experience with air monitoring, gas chromatography, and drafting.

Served as on-site technical supervisor and chemist in the cleanup operation at a pesticide warehouse fire.

On-site technical supervisor and chemist for the safe handling and cleanup at several cyanide spill incidents (designed emergency cyanide spill test kit).

On-site technical supervisor and field chemist responsible for the biodegradation of phenol contaminated soil using a modified landfarming technique.

On-site analytical supervisor for the underground recovery and subsequent biological treatment of spilled volatile organic solvents.

Sampling, sample preparation, and analysis of tanks containing PCBs, metals, etc., at an abandoned waste oil reclamation center.

EDUCATIONAL BACKGROUND B.S., Zoology, Ohio State University, 1978
Ohio Class I License - Water Treatment Plant Operator

EMPLOYMENT HISTORY O.H. Materials Co., 1981 - Present

Universal Cooperatives, Inc. (Farm Chemical Div.), Formulation Dept. Supervisor - Laboratory Manager/ Chemist, 1979 - 1981.

Defiance Municipal Water Treatment Plant, Plant Operator, 1978 - 1979.

PROFESSIONAL AFFILIATIONS American Chemical Society
American Water Works Association

After the Daily Reports have been audited and any corrections made, they are forwarded to Accounts Receivable for the processing of an invoice. Accounts Receivable again checks the computations and adds to the Daily Reports copies of any invoices of expendable items that they have received. Daily totals of personnel, equipment, analytical services, per diems, miscellaneous, and subcontractors are listed along with the total amount due. The Findlay Accounting Office maintains records of the actual amount invoiced, the date payment is due, and total amount invoiced to date.

ADDITIONAL RECORDS - Daily Reports and notes are the primary records of job activities and progress; however, many of our clients request that we also complete forms for their internal record keeping. These forms are normally compatible with our Daily Reports and reflect the same information.

The Administrative Assistant on site maintains a log of daily cost. This information is taken from unaudited reports and is a quick reference source.

The Administrative Assistant is responsible for reporting all expenses incurred in a weekly expense report and a weekly summary of vendors. The expense report gives a detailed listing of all credit cards and cash expenses incurred weekly. The weekly summary of vendors is submitted along with the weekly expense report. This report is a listing of all charges set up by purchase orders and includes the purchase order number, vendor's name, and service rendered.

Along with the above-mentioned reports, the Administrative Assistant is responsible for any additional reports or documents which the client may request for the purpose of further explaining costs or billing procedures of OHM.

DISPATCHING - As resources are dispatched to or from a project, they will be entered in the computer. This provides the dispatcher and project manager a listing of personnel, equipment, and inventory dispatched and updates the listing of resources on hand.

RESOURCES ON HAND - This is an inventory of all personnel, equipment, supplies, and subcontractors on the project site.

DAILY REPORTS - Inventory records are available based on the file of Resources On Hand, the computer will print the Daily Report listing personnel, equipment, analytical services, subcontractors, and expendable items. The time worked, the billing rate, and total cost for the day are also computed.

PROJECT INVENTORY - Based on shipments to or from the project, purchases made, and items previously expended.

EDIT LISTING - This report indicates the differences between Daily Reports of previous day and current day.

PROFESSIONAL PROFILE

G. JACK HERZIG

TITLE Field Project Chemist

EXPERTISE Analytical Chemistry, Hazardous Waste Characterization and Disposal

EXPERIENCE Extensive experience in the compatibility testing, treatment, and disposal of hazardous materials.

Responsible for regulatory compliance including USEPA and DOT guidelines.

Supervision of chemists performing sample analysis and field operational duties.

Devised treatment and disposal techniques for toxic substances. Developed a classification scheme for the identification of hazardous materials for a major waste site containing 60,000 drums of hazardous substances. Also designed and implemented wastewater treatment systems and analytical monitoring systems.

Participation in hundreds of emergency response projects as well as planned removal projects.

Additional duties performed at job site include:

- the supervision of 12 field chemists performing compatibility testing, bulking, and handling of lab packs at the Chemical Control waste site;
- the supervision of classification and compatibility testing of 15,000 drums of toxic waste;
- cyanide monitoring;
- identification of explosives;
- participation and supervision of waste treatment including carbon filtration, air stripping, steam stripping flocculation and clarification.

EMPLOYMENT HISTORY O.H. Materials Co., 1973 - Present

Wadsworth Testing Laboratories, Technical Director, 1971 - 1973

Pathology Laboratories, 1968 - 1972

EDUCATIONAL BACKGROUND B.S. A.S.C. approved degree in Chemistry, 1972

University of Toledo, majored in Chemistry, 1968 - 1972

PROFESSIONAL PROFILE

JAMES M. HIGGINS

TITLE

Field Chemist

EXPERTISE

Analytical/Environmental Chemistry

EXPERIENCE

Experience with sampling a broad range of hazardous materials. Responsible for sample preparation and analysis with the gas chromatograph. Also, experience in the computer programming area.

Responsible for groundwater monitoring and analysis for chloroform using GC with headspace and for monitoring a tetraethyllead spill with a photoionization detector.

Sample preparation of PCBs in water, oil, soil, and sludge matrices.

Sampling of oil from tanks and sample preparation for PCBs and metals. Also experience with EP Toxicity analyses and the bomb calorimeter.

Responsible for compatibility testing, PCB analysis, and flash point for composite samples from a major drum sampling project.

EDUCATIONAL BACKGROUND

B.A., Zoology, University of Montana, 1980

EMPLOYMENT HISTORY

O.H. Materials Co., 1980 - Present

Arthur D. Lawler Ltd., Recovery Technician - Chemical and Oil Spills, 1971

PROFESSIONAL AFFILIATIONS

American Chemical Society

PROFESSIONAL PROFILE

DUANE L. WINEGARDNER

TITLE Senior Hydrogeologist

EXPERTISE Site Investigations and Assessments

EXPERIENCE Responsible for a wide variety of hydrogeologic, hydrologic and geotechnical investigations for projects related to waste management problems, hazardous waste site investigations, site restoration and enforcement of waste management regulations.

Provided hydrogeologic expertise in the assessment and development of groundwater resource potential; the investigation of groundwater and related surface water contamination; and the recommendation of mitigative measures and development of alternatives including treatment programs, disposal techniques and monitoring programs.

EMPLOYMENT HISTORY

O.H. Materials Co., 1983 - Present

Monenco, 1982 - 1983, Senior Hydrogeologist

Environmental Science & Engineering 1982, Group Leader - Soils & Geophysical Group

St. Johns River Water Management District, 1977 - 1979, Dir. of Div. of Enforcement; Hydrogeologist

A. Bentley & Sons Construction Co., 1974 - 1977, Quality Control Engineer

Hydro Company, 1971 - 1975, Partner/Well Driller/Consulting Geologist

ACADEMIC BACKGROUND

M.S., Hydrology and Geology, University of Toledo, 1971

B.S., Geology, University of Toledo, 1967

PROFESSIONAL AFFILIATIONS & PUBLICATIONS

American Water Resources Association, Registered Professional Engineer, Florida, Georgia, and Tennessee

Professional Geologist - Indiana

"Contamination of Groundwater Samples with PVC Adhesives and PVC Primer from Monitor Wells" D.L. Winegardner, et al.

PROFESSIONAL PROFILE

JAMES R. QUINCE

TITLE

Hydrogeologist

EXPERTISE

Hydrogeological site investigations and interpretation

EXPERIENCE

Supervised numerous hydrogeological investigations involing installation of boreholes and piezometers to survey groundwater contamination from chemical and petroleum pollutants

Performed waste site leaching studies

Design and supervision of well installations

Groundwater and soil sampling programs

EMPLOYMENT HISTORY

O.H. Materials Co., 1981 - Present

Garden Brook Corporation, Manager, Commercial Business, 1978 - 1980

University of Waterloo, Coop Assignments:
- University Driller, Driller's Assistant - 1977
- Challenger Drilling, Floorman - 1976
- Canadian Government, Gravity Survey Operator and Geological Sampler - 1975
- Hudson Bay Exploration Company, Geophysical Survey Operator - 1975
- Pressure Vessel Service, Inc., Maintenance Department, 1974

ACADEMIC BACKGROUND

B.S., Honours Earth Science Program, University of Waterloo, 1973 - 1978

Numerous training seminars and courses

PROFESSIONAL AFFILIATIONS

Member of the National Water Well Association, Groundwater Technology Division

SELECTED PUBLICATIONS

"Hydrogeological Studies of the Woolwich Township Sanitary Landfill," A study for the Regional Municipality of Waterloo, Waterloo, Ontario, Canada, 1978

"New Evidence from Offset Aeromagnetic Anomalies for Transcurrent Faulting Associated with Bathurst and McDonald Faults, Northwest Territories," Canadian Journal of Earth Science, Vol. 12; No. 9, 1976

"Monitoring, Recovery and Treatment of Polluted Groundwater," Presented to ASCE, Hazardous Waste Management Conference, Columbus, Ohio. 1982

PROFESSIONAL PROFILE

DAVID E. MEEKER

TITLE General Foreman

EXPERTISE Sampling, laser operations

EXPERIENCE Responsible for sampling and general cleanup of sites including the operation of lasers. Also experience with operation and maintenance of carbon filtration system for wastewater.

Cleanup and removal of low level radioactive wastes.

Assisted with underground recovery system for water contaminated with chloroform.

Responsible for sampling and maintenance of sand and carbon filtration systems for treatment of PCBs in water.

Participated in general cleanup and laser operations at an underground subway station contaminated with PCBs.

EMPLOYMENT HISTORY O.H. Materials Co., 1980 - Present

ACADEMIC BACKGROUND Otsego High School, GED, 1971

APPENDIX A

STANDARD SAFETY PROGRAM

STANDARD SAFETY PROGRAM

INTRODUCTION

The OHM Standard Safety Program is patterned after those detailed in:

- "Hazardous Materials Response Manual", U.S. Coast Guard Draft Document 26 May 1982, LCDR T. W. Josiah, Chief, Environmental Coordination Branch, Washington, DC.

- "Interim Standard Operating Safety Procedures", USEPA, Draft Document April, 1981, Emergency Response Division, Washington, DC.

The above documents represent the state-of-the-art guidelines for personnel protection at hazardous waste sites. Selected portions have been excerpted for this program summary. Details should be obtained from the above documents, with first reference being made to the USCG manual.

In addition, a training program developed and utilized by OHM is included in this Standard Safety Program. Furthermore, for each project, supplemental site-specific safety programs are developed.

SAFETY COORDINATOR

The Corporate Safety Coordinator is responsible for all safety related matters for the entire Company, including safety training, health monitoring, development and implementation of safety policies and procedures, and development of project safety programs. On a particular project, the Coordinator will be assisted by various personnel who are trained and experienced in operational safety matters. However, he is still responsible for ensuring that a project is accomplished in a safe manner.

SAFETY TRAINING PROGRAMS

At Corporate Headquarters, safety topics are selected and presented daily by trained safety personnel. They are discussed in detail and demonstrated to all available operating personnel in a classroom/simulated field environment. A partial list of topics is included in Table 1.

TABLE 1

SAFETY AND TRAINING TOPICS

I. Company Rules

II. Orientation for New Employees

III. Respiratory Protection
- A. Self-contained Breathing Apparatus (SCBA)
- B. Manifold Systems
- C. Respirators
  - 1. Fit check--maintenance
  - 2. Cartridge selection
- D. Ingress and Egress Techniques

IV. Protective Clothing
- A. Acid Splash Suit
- B. Disposable Suit
- C. Fully Enclosed Suit
- D. Boot and Glove Type
- E. Eye Protection

V. Decontamination and Hygiene
- A. Respirators
- B. Protective Clothing
- C. General Equipment
- D. Personal Hygiene

VI. Basic Equipment

VII. Training
- A. Heavy Equipment
- B. First-aid
- C. CPR
- D. OSHA Safety Courses
- E. Buddy System
- F. Use of Safety Plan
- G. Field Analytical Techniques and Sampling
- H. Emergency Procedures

VIII. Advanced Training
- A. Field Leadership and Management
- B. Reference Sources
- C. Process Development

IX. Specialty Topics
- A. Hazardous Assessment and Mitigation
- B. Reference Sources
- C. Chemical Characteristics
- D. Process Design
- E. Others as Required or Requested

Sessions are rotated and updated on a regular basis to ensure that all operational personnel are proficient and up-to-date on the topics. Safety training data sheets are utilized to document type and hours of specific training for each employee. This helps to ensure that all employees are adequately trained for their job assignments, and are kept current in their training.

Prior to being dispatched to a project site, new personnel must be approved by the Corporate Safety Coordinator. Approval is based on completion of the required training program, safety consciousness, and general attitude.

Experienced personnel attend both introductory and advanced safety training sessions. They participate in demonstrations and conduct small study groups. Specialty training is given for topics such as the chemical characteristics of substances likely to be encountered on a specific project. All personnel are encouraged to make suggestions for improvement concerning any aspect of the safety training programs.

Daily planning and safety meetings are conducted at project sites to inform each work team of its activities and pertinent safety considerations. Hazard identification, warning and contingency plans are developed in advance, and employees are constantly briefed on their involvement should these plans be needed. Personnel are encouraged to report potential and actual problems to foremen and/or supervisors during the workday as well as during the safety meetings.

EMPLOYEE HEALTH MONITORING

All OHM personnel participate in a medical and health monitoring program. This program is initiated when the employee starts work with a complete physical and medical history and is continued on a regular basis. (See Table 2.) This program was developed in conjunction with a medical doctor who is assigned to direct the program and maintain familiarity with OHM personnel. This doctor is familiar with toxicology. Consultants are retained when additional expertise is required.

TABLE 2

WORKER MEDICAL PROFILE

	Item	Frequency: Initial	Quarterly	Annual
1.	Medical History	X		X
2.	Work History	X		X
3.	Visual Acuity and Tonometry	X		X
4.	Pulmonary Function Tests	X		X
5.	Physical Examination	X		X
6.	Audiometry Tests	X		X
7.	Chest X-ray	X		X
8.	Electrocardiogram	X		
9.	Complete Blood Counts	X	X	
10.	Blood Chemistry[1]	X	X	
11.	Cholinesterase - Pseudo-cholinesterase	X		X
12.	Complete Urinalysis	X	X	
13.	Nerve Conduction Velocity Tests	X		X
14.	Dermatology Exam	X		X
15.	Pap Smear (as applicable)	X		X
16.	Blood Typing	X		
17.	Specific Tests (as required)			
	a. PCB blood or fat			
	b. Urine mercury			
	c. Urine arsenic			
	d. Urine phenol			
	e. Urine halomethanes			
	f. Audiometry			
	g. Blood cyanide			
	h. Electrocardiogram			

[1]Includes albumin, total protein, bilirubin, SGPT, SGOT, LDH, alk. phosphatase, globulin, calcium, potassium, phosphorus, uric acid, creatinine, area nit., cholesterol, triglycerides, glucose, sodium chloride.

SITE INSPECTIONS

Before a project starts, work sites are inspected to identify particular hazards and define site security. This inspection is performed by the Corporate Safety Coordinator or his designated representative. Hazards are evaluated as to their effect on operations and personnel safety. This process continues on a daily basis once the project begins.

MINIMIZATION OF EXPOSURE TO HAZARDS

The basic concept of minimizing employee exposure to the hazards on project sites is divided into four areas: engineering control, organization, site control, and decontamination.

Engineering Controls

Engineering controls on projects are implemented through the use of custom-designed and -fabricated equipment. An overall policy for the use of this equipment cannot be developed, since the use is very specific to the individual project. In general, however, the specially fabricated equipment and/or procedures used are designed:

- to reduce the potential for explosions by use of beryllium tools and parts
- to establish barriers or shields between product and handler
- to reduce the number or amount of handling incidents through the use of time-saving equipment.

Examples of custom-designed and -fabricated equipment used on past projects are as follows. A barrel grappler was developed to eliminate manual handling of drums, place the operator at least 20 feet from the drums behind a 1-inch thick, bulletproof, Plexiglas shield, and provide the operator with a source of breathing air. Not only did the grappler increase project safety, but it also greatly increased project productivity. Other examples of environmental engineering controls through the use of custom-designed and -fabricated equipment are mobile fume scrubbers, decontamination units, and portable vacuum skid units.

Organizational

The number of personnel, organizations, and activities involved in incident response can vary greatly. In order to effectively accomplish the activities required by a particular incident, an orderly, integrated response effort needs to be established. To accomplish this, the various response personnel and their activities must be organized into a structured unit capable of conducting the operations required.

Although no one organization will suffice for all incidents, there are certain commonalities among incidents which can be utilized for planning an organization. The general structure of the organization and the functions to be performed would be modified to meet the requirements imposed by a specific response situation.

The primary goal is to establish an organization capable of effectively managing and directing response activities for the successful mitigation of an incident. Common elements needed in an organization are:

-Designation of an Officer-in-Charge
-Defining responsibilities and functions
-Delineation of authority
-Establishing communications/lines of authority
-Coordination of activities and functions
-Resource management: equipment, money, and personnel
-Planning efforts
-Public relations and information

To effectively manage the various activities required at a site, personnel must be selected and assigned the responsibility for conducting specific operations. The positions, functions, and responsibilities below represent a major response effort and should be adapted with the requirements of a particular response.

On-Scene Coordinator (Office-in-Charge) (OSC)

One clearly defined individual with the authority and responsibility to manage and direct the response operation.

Scientific Coordinator

Responsible for directing and coordinating activities related to scientific studies, sample collection, field monitoring, analysis of data, interpretation of results, and remedial actions provides guidance to the OSC in these areas.

Safety Officer

Provides advice and consultation to the OSC on all matters related to the health and safety of those involved in site operations. Establishes and directs the safety program.

Field Operations Leader

Directs activities related to mitigative efforts of cleanup contractors and others involved in these activities. May be responsible for team leaders.

Public Information

Responsible for releasing information to the news media and the public concerning site activities.

Security

Responsible for general site security. Generally local law enforcement personnel.

Record Keeper

Responsible for official record of site activities.

Team Leaders

Responsible for specific tasks assigned such as:

-Entry team(s)
-Decontamination
-Sampling
-Monitoring
-Equipment
-Photographic
-Communications
-Other specific tasks

Financial Officer

Provides financial and contractual support.

An organizational chart should be drawn linking the various functions and establishing the communications channels that are to be used. To a large degree the organization chart is dependent on the functions to be performed (the level of response) and the Project Leader's mode of operation. The key points to consider in drawing an organization chart are:

-Clearly defined functions and responsibilities
-Established chain of custody
-Understandable communication links
-Delegation of authority
-Effective working relationships

Site Control

Introduction

An incident generally involves the escape of normally controlled substances into the environment via air, water, or land surface and response activities involve actions to minimize and

prevent these discharges. Site control is preventing or reducing the transfer of hazardous materials (contaminants) from the site by workers and equipment involved in site operations.

Site control involves two major activities: (1) physical arrangements and control of the site work areas; and (2) methods for the removal of contaminants from people and equipment.

Control is needed to reduce the possibility of transport from the site of contaminants, which may be present on personnel and equipment. This can be accomplished in a number of ways, including:

- -Physical barriers to exclude unnecessary personnel
- -Checkpoints with limited access to the site, or areas within the site
- -Minimizing personnel and equipment on site consistent with effective, safe operations
- -Establishment of containment zones
- -Decontamination procedures
- -Conducting oprations in a manner to reduce possibility of contamination

Work Zones (Figure 1)

One method of reducing the potential for transfer of contamination is to delineate zones or work areas within the vicinity of the incident based upon expected or known levels of contamination. Within these zones, prescribed operations would occur utilizing appropriate personnel protective equipment. Movement between areas would be controlled at checkpoints. Three contiguous zones are recommended:

- -Exclusion Area (contaminated)
- -Contamination Reduction Area
- -Support Area (non-contaminated)

Exclusion Area

The Exclusion Area is the innermost area and is considered contaminated or "hot". Within the Exclusion Area, prescribed levels of protection must be worn by all entering personnel. An entry checkpoint must be established at the periphery of the Exclusion Area to control the flow of personnel and equipment between contiguous zones and to ascertain that the procedures established to enter and exit the zones are followed. The Exclusion Area boundary would be established initially based on the type of the pollutant(s)/spilled materials, initial instrument readings, and safe distance from any potential exposure.

Subsequently, the boundary may be readjusted based on additional observation and/or measurements. The boundary should be physically secured, fenced, posted, or well defined by geographical boundaries.

The Exclusion Area could be further sub-divided into three separate zones based on their known or potential levels of contamination. This would allow for more flexibility in operations, decontamination procedures, resources, etc. These zones are defined as follows and correspond to the corresponding Levels of Protection:

Zone A - The area of greatest contamination potential; area requires highest level of respiratory, skin, and eye protection. This is a level "A" personnel protection area.

Zone B - The area of next highest contamination potential; area requires highest level of respirator protection and lower level of skin and eye protection. This is a level "B" personnel protection area.

Zone C - The area where exposure potential, concentration and/or route(s) of contamination are relatively known and are assumed not greater than the protection factor associated with a full-face mask air-purifying respirator. This is a level "C" personnel protection area.

Basic air monitoring and site sample analyses are the governing factors for determining the range of specific boundary perimeters. Extensive testing in the field contributes to the final classification of the boundary type and size. Physical field testing consists of the following:

1. Explosive concentration of gases.
2. Detection, analysis, and concentration of toxic gases.
3. Adequate oxygen in the atmosphere.
4. Concentration of radioactive materials.

These criteria are defined as follows:

1. Vapor Explosives

   If a vapor explosiveness is greater than 20 percent, a careful study will be made of the area at ground, waist, and head levels. If the vapor explosiveness is greater than 35 percent, the work party is immediately withdrawn.

2. Toxic Gases

   The analyses to determine the concentration of any toxic vapors or gases present will be done by accepted EPA or NIOSH criteria methods. Upon any significant or measurable exposure rates, appropriate respiratory and/or personal protective equipment will be used as prescribed by the project site supervisor.

3. Oxygen Exclusion in the Area

   If the oxygen level in the area is less than 19.5 percent, the SCBA equipment or air-supplied manifold respirators will be used, and a special marking made to designate the precise area.

4. Radioactivity

   If a field survey with a Geiger counter reveals a background reading of less than 0.02 MR, this is considered normal. If reading levels range from 0.02 MR to 2.0 MR, the entry party will continue the survey, but continually watch for higher readings at frequent intervals. Any readings above 2.0 MR give cause for concern and dictate termination of the site inspection.

Support Area

The Support Area is the outermost area of the site and is considered a non-contaminated or "clean" area. It is designated as a controlled traffic area for authorized support personnel and the location for support equipment. Since normal work clothes are the appropriate apparel within this zone, potentially contaminated personnel clothing, equipment, etc., are not permitted.

Contamination Reduction Area

Between the Exclusion Area and the Support Area is the Contamination Reduction Area. The purpose of this zone is to provide an area to prevent or reduce the transfer of contaminants which may have been picked up by personnel or equipment returning from the Exclusion Area. All decontamination activities occur in this area.

The boundary between the Support Area and the Contamination Reduction Area is the "Contamination Control Line". This boundary separates the possibly contaminated area from the clean zone. Entry into the Contamination Reduction Area from the clean area should be through an access control point. Personnel entering at this station would be wearing the prescribed personal protective equipment for working in the Contamination Reduction Area. Exiting the Contamination Reduction Area to the clean area requires the removal of any suspected or known contaminated personnel protection equipment and that appropriate decontamination procedures be followed.

At the boundary between the Contamination Reduction Area and the Exclusion Area is the "Hot Line" and access control station. Entrance into the Exclusion Area requires the wearing of the prescribed personnel protection equipment which may be different than the equipment requirements for working in the Contamination Reduction Area. At a point close to the "Hot Line", a personnel and/or equipment decontamination station is established for those exiting

the Exclusion Area. In some cases, another decontamination station is needed closer to the Contamination Control Line for those working only in the Contamination Reduction Area.

The use of a three-zone system of area designation, access control points and exacting decontamination procedures provides a reasonable assurance against the translocation of contaminating substances. This control system is based on a "worst case" situation. Less stringent site control and decontamination procedures than described may be utilized based upon more accurate information on the types of contaminants involved and the contaminating hazards they present. This information can be obtained through air monitoring, instrument survey, etc., and technical data concerning the characteristics and behavior of material present. Predicated upon having more reliable data about encountered conditions, site control requirements can be modified for the specific situation.

Location of Field Command Post

The location of the Field Command Post, and other support necessities in the Support Area (clean zones) are dependent on a number of factors including:

Practicality - The terrain, topography, open space, etc., limit the location of Command Post sites.

Wind Direction - Preferrably the Command Post should be located upwind of the site Exclusion Area. However, wind directions shift and other conditions may be such that the ideal location based on wind direction does not exist.

Accessibility - Adequate roads, power lines.

Area Dimensions

The distance between Exclusion Area (Hot Line), Contamination Reduction Area, (Contamination Control Line) and Support Area (Command Post) are approximate distances only (Figure 1). Considerable judgment is needed to assure safe working distances for each area balanced against practical work considerations. Long-term operations would involve contamination tests for determining the transfer of material and dictate readjustment of zones.

The following critria are to be considered in determining the area dimensions:

-Physical and topographical barriers
-Meteorological conditions
-Field/laboratory measurements
-Explosion/exposure potential
-Physical, chemical, toxicological, etc., characteristics of the contaminant(s)
-Cleanup activities

Personnel and Equipment Decontamination

Hazardous substances are acutely or chronically toxic or otherwise hazardous to man, animals, or plants. Decontamination is the process for neutralizing or removing contaminants. To avoid contamination of field inspectors and the subsequent transfer of hazardous substances to clean areas, a thorough decontamination process is required for personnel and equipment involved in field inspections or investigations.

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Every effort should be made to prevent direct contact with the contaminant. Careful planning, knowledge of the contaminant, and attention to where one puts his hands and feet are all important. Simple common sense rules of contamination avoidance include not sitting down, not leaning against drums or debris, and not putting equipment on the ground. Although no one should enter a site alone, all tasks should be accomplished with as few team members as possible. In this way exposure is limited to the minimum number of personnel and the decontamination task is greatly simplified.

The first step in the decontamination process may well take place while the team is still on or just off the hazardous site, but still in the Exclusion Area. This is especially true if there is known heavy ground contamination. In areas of spills or heavy leachate runoff, the protective boots will become heavily contaminated. As the team leaves these areas enroute to the personnel decontamination station (PDS), a boot rinse with a detergent solution (from a pre-positioned container) will significantly reduce the spread of contamination along the egress route.

The PDS is established within the Contamination Reduction Area upwind of the hazardous substance site. The PDS is located between the Hot Line (upwind boundary of the Exclusion Area) and the support (clean) area boundary. Figure 1 illustrates the organization of the field operation area.

The PDS provides a controlled decontamination and undressing system designed to avoid the transfer of chemical contamination from protective clothing or equipment to the individual. It must be established before the team enters the contaminated area so that members can immediately and safely cope with an emergency. Team members must be briefed on decontamination procedures prior to entering the contaminated area. When the team leaves the area, extreme care must be taken to insure that proper decontamination is performed on both personnel and equipment. Failure to observe these procedures could result in personal injury.

In general, decontamination at the site consists of rinse equipment and personnel with copious amounts of water and washing with a detergent/water solution. If contaminants are known, then a specific detergent and/or solvent can be used to decontaminate. Figure 2 illustrates the maximum physical layout for personnel

decontamination during a worst case situation. Figure 3 illustrates the minimum physical layout for personnel decontamination for a relatively small, well identified situation. Each site requires special consideration and the decontamination procedures should be modified from the maximum to minimum layout based on known information. The project team leader must exercise professional judgment in determining how the PDS will be organized and what decontaminants will be used. Factors to be considered include: (1) the extent and type of hazard expected, (2) explosive potential, (3) meteorological conditions, (4) topography, (5) levels of protection selected, and (6) availability of equipment and supplies.

The decontamination process uses water and rinse solutions for washing down personnel and equipment. The spent solution, brushes, sponges, containers, stands, etc., used in the decontamination process must, until shown otherwise, be considered contaminated and properly disposed.

Personnel equipment worn into the Exclusion Area and subsequent operations, therefore, it should be stored for air drying.

The decontamination of equipment, material and personnel used or working in the Contamination Reduction Area may be somewhat less complex than "Hot Line" procedures. Exact procedures would depend on the probability of those items being cross-contaminated.

In extreme situations, complete decontamination of personnel protective equipment, instruments, and small items may have to be done in a controlled laboratory situation.

Identifying and quantifying the presence or absence of unknown contamination substance(s) is a difficult and costly task. To verify the initial decontamination procedures and/or the effectiveness of these procedures, contamination/decontamination testing is necessary unless the items are to be disposed as contaminated wastes.

Once the Hot Line section of the Exclusion Area boundary has been established, the PDS is set up.

Layout of a Maximum PDS

The layout is shown in Figure 2. Following is a description of the equipment needed.

STATION A - Equipment Drop - A plastic ground sheet on which field equipment is placed by returning members of the work party.

STATION B - Decontamination of Outer Garments

-A wash tub filled with Decon Solution A
-A second wash tub filled with rinse solution

-A third wash tub filled with Decon Solution B
-A fourth wash tub filled with rinse solution
-Each wash tub should be equipped with a large sponge and brush

The complete USCG document describes several types of solutions for use with specific contaminants.

STATION C - A bench or stool for personnel to sit on during removal of boots; a ten gallon pail with plastic liner where disposable boot covers are discarded

STATION D - Two ten gallon buckets filled with Decon Solution A and B respectively

STATION E - Glove and Boot Rinse - A ten gallon bucket filled with rinse water

STATION F - Boots and Outer Garment Removal
-Bench or stool for personnel to sit on
-Large trash cans with plastic liners to receive rubber items.

A distance of approximately 30 meters should separate Stations F and G.

STATION G - Remove SCBA
-Plastic sheet on which the SCBA can be placed

STATION H - Removal of Inner Gloves and Socks
-Bench or stool for personnel to sit on

STATION I - Field Shower - If a shower is impractical or not available, a wash point should be provided as a minimum protection

STATION J - First-Aid
-Render first-aid as necessary
-This station separates the Contamination Reduction Area from the Support (clean) Area

The above layout, as illustrated in Figure 2, is for Level A protection and is set up for a worst case situation. Figure 3 is a layout for a minimal decontamination operation in a small, well defined situation.

Less extensive procedures for decontamination can be subsequently or initially established when the type and degree of contamination through analysis becomes known or the potential for transfer is judged to be minimal. These procedures generally involve one or two wash downs only, and fewer precautionary measures in doffing equipment. These procedures would not involve additional decontamination of protective clothing removed.

In extreme situations when there may be a question of the efficacy of decontamination to known or strongly suspect substances of a highly toxic nature, protective clothing may have to be discarded after use or tested after decontamination.

Consideration must also be given to the protective equipment worn by those personnel operating the decontamination line. In most cases, chemical protective clothing, boots, and gloves should suffice. Unless it is suspected and/or confirmed that personnel needing decontamination are highly contaminated, air-purifying respirators with suitable canisters can be worn (Level C Protection).

The suggested list of equipment required to set up and operate a typical PDS for Level A Protection is given in the complete USCG document.

Closure of the PDS

When the PDS is no longer needed, it should be closed down by the PDS operators. All disposable clothing and plastic sheeting used during the operation should be double-bagged and either contained on site or removed to an approved off-site disposal facility. Decon and rinse solution could be discarded on site or removed to an approved disposal facility. Reusable rubber clothing should be dried and prepared for future use. (If gross contamination had occurred, additional decontamination of these items may be required.) Cloth items should be bagged and removed from the site for final cleaning. All wash tubs, pail containers, etc., should be thoroughly washed, rinsed, and dried prior to removal from the site.

EMERGENCY PROCEDURES

Contingency plans for emergencies are as follows:

- Fires, Severe Storms

  1. A fire extinguisher will be maintained on site.

  2. Radio and/or telephone contact will be maintained with the local fire department.

  3. At least two access routes for emergency vehicles will be maintained throughout the duration of the project.

  4. OHM supervisory personnel, after consulting with local law enforcement and fire officials, will develop a site evacuation plan in case of a serious problem.

- Toxic Vapor Release

  1. Upon receiving an unsatisfactory air quality reading from an instrument, the field chemist will notify the foreman in the immediate area.

2. The foreman will have the area evacuated and notify the proper supervisor of the incident by radio.

3. A field chemist and a foreman (suitably equipped in safety gear) will use a portable monitoring device to find the contributing source.

4. Once the source is located, the foreman and chemist will take the necessary steps to contain and isolate the problem.

- Medical Emergencies

1. Personnel from local medical facilities will be briefed on the nature of the project so they can make preparations for medical emergencies.

2. Due to the remote location of the project, emergency medical transportation services will be made available at the site.

3. Supervisory personnel from OHM have first-aid instructor's training, and first-aid kits will be available at the facility along with emergency oxygen inhalation systems and emergency eye showers.

4. Safety is stressed. Personnel are trained in safe work procedures, and safe work practices are insisted upon by Company supervisory personnel. Work practices have been inspected by OSHA.

- Liquid/Solid Waste Spills

1. Equipment will be maintained on site to cleanup spilled materials. Heavy construction equipment such as front-end loaders and backhoes can easily pick up spilled solids and repackage them in new drums. Vacuum units can be used to contain spilled liquids, or the liquids can be mixed with inert sorbent material to immobilize them. If drums are used, enough sorbent material will be maintained on site to absorb the contents of at least 20 percent of the number of drums processed per day.

2. Personnel are highly trained in spill control and prevention methods.

3. Methods of mechanically handling hazardous materials minimizes spillage.

LABORATORY SAFETY

The utmost attention is paid to safety for employees and personnel associated with the main laboratory and the field laboratories. In addition to OSHA regulations, extensive procedures and

precautions to prevent accidents and ensure a safe working environment have been developed.

Safety is an active program. OHM laboratories are standardized with safety equipment such as safety showers and eye wash, fire extinguishers, first-aid kits, fume hoods, and laboratory spill kits for accidental spills of hazardous materials. Personnel are trained and equipped with the latest techniques and equipment to make a safe working place for everyone, including themselves.

When handling samples, a chemist or technician will determine what precautions need to be taken before he comes in contact with hazardous materials that may be contained in the sample. Personnel always use sample gloves when handling samples. The chemist determines the need for further protection such as respirators, face shields, or splash shields. Laboratory personnel always protect themselves with safety glasses, gloves, lab coats, and appropriate footwear. Safety is of primary importance to the chemist, and he applies this consideration to all work situations.

APPENDIX B
ADMINISTRATIVE REPORTING

ADMINISTRATIVE REPORTING

The following is a brief description of the daily billing procedure and reports presently being used by O.H. Materials Co. (OHM).

DISPATCH FORMS - All equipment, personnel, and supplies that are sent to or from a job site are recorded on Dispatch Forms. The dispatcher retains one copy, the accounting office receives a copy, and the original is sent with the shipment to be checked and signed by the receiver. The Dispatch Form is used extensively to document movement of personnel, equipment, and supplies.

DAILY REPORTS - Daily Reports are filled out on site by an Administrative Assistant. Personnel, equipment, and expendable supplies are transferred from the Dispatch Form to the Daily Reports where hours and rates are recorded as per the published rate sheet of OHM. Personnel and equipment hours are logged daily in the bound job notes. A credit is issued for any unused expendable items. When a cash purchase is made, the invoice is attached to the Daily Report. Items purchased through a Purchase Order are listed as awaiting billing and will be charged to the client when the invoice is received by the Accounts Payable Department in Findlay.

OHM's subcontractors are required to submit a Daily Report to the Administrative Assistant for approval. Upon approval, he transfers this to an OHM's Daily Report. The client is invoiced for the subcontractor's work when OHM receives an actual invoice from the billing office of the subcontractor.

Before completing the Daily Reports, the Administrative Assistant reviews the notes of the day. After verifying the completeness and correctness of the entries, the Daily Reports are filled out in triplicate and subtotaled by the following categories: personnel, equipment, analytical equipment, expendables, and subcontractors. The report is reviewed and, if satisfactory, is signed by the Administrative Assistant, reviewed by the Project Supervisor, and given to the on-scene coordinator of the client for review and approval. The client receives a copy of the Daily Report, a copy is kept on file by the Administrative Assistant, and copies of the Daily Reports (along with corresponding job notes) are forwarded to the accounting office in Findlay.

The Daily Report is audited by the Findlay Office before final billing. The Supervisor of Field Administration is responsible for the review and audit of the Daily Reports. Personnel and equipment billed are compared to Dispatch Forms and the daily notes. Personnel hours are checked against time cards, rates are checked, and all math computations are recalculated. Any questions about the billing procedure or changes made are referred to the project site for explanation and/or approval.

RESOURCE LOCATION REPORT - This report lists all personnel, equipment, and stock by location in order to determine what resources are available.

INVOICE - The invoice is printed weekly giving daily totals of personnel, equipment, analytical services, and expendables. Subcontractors and on-site purchases are to be billed as invoices and are received at the main office in Findlay, Ohio. The Daily Reports and invoices for on-site purchases and subcontractors are attached to the invoice.

JOB ANALYSIS REPORT - This report shows the total billing to date of personnel, equipment, analytical services, subcontractors and expendables.

JOB BILLING HISTORY - This report lists all billings, total payments received, total amount due, discounts available, and discounts taken.

AWAITING BILLING - This report lists subcontractors and expendable field purchases which have not yet been billed to the client. When combined with the Job Analysis Report, the total cost of the project can easily be computed.

PERSONNEL FILES - This file provides history on the experience and capabilities of all employees. It can also provide medical history and personal identification information.

EQUIPMENT FILE - This data system provides equipment maintenance records, specification, and utilization.

WEATHER RECORD - A record of the weather conditions during the project is to be available since efficiency and technical approaches are often affected by temperature extremes and/or precipitation levels.

PROFESSIONAL PROFILE

STEVEN J. DOHERTY

TITLE Field Chemist

EXPERTISE Instrumental analysis, sample preparation

EXPERIENCE

Experience with a variety of instrumentation including gas chromatograph, Hall, FID, ECD and NPD detectors with headspace. Also atomic adsorption spectrophotometer, bomb calorimeter and total organic carbon analyzer.

Responsible for wastewater treatment including flocculation and centrifugation; air monitoring with mobile infrared gas analyzer, photoionization detector, explosimeter, and telematic air sample pumps. Performed organic extractions and general sample preparation for a number of hazardous mateials. Experience with compatibility testing and bulking in addition to contact with clients and regulatory agencies.

Additional project experience includes:

- Supervision of field laboratory.
- Operation of on site water treatment system. Also, sample preparation on oil, water, and sludge for PCBs, organics and metals.
- Sample preparation and analysis for herbicide spill.
- Air monitoring for tetraethyllead.
- Waste profile for disposal at hazardous waste site.
- Air monitoring, GC analysis and sampling (soil, bore, air) for hexamethylphosphoramide.

EMPLOYMENT HISTORY O.H. Materials Co., 1981 - Present

EDUCATIONAL BACKGROUND B.A., Chemistry, Wabash College, 1981

PROFESSIONAL AFFILIATIONS American Chemical Society

PROFESSIONAL PROFILE

MARK O. ERICKSON

TITLE	Field Engineering Technician
EXPERTISE	Field Geology/Hydrology
EXPERIENCE	Collection and analysis of geological/hydrological field data, field mapping and familiarity with chemical contamination problems. Experience in the supervision and design of drilling programs, well logging and sample analysis. Hands on experience in securing exploratory well locations and associated construction including large diameter wells, pump and water treatment installation and repair, and groundwater sampling techniques to determine possible chemical contamination. Experience in the operation of a wide range of drilling equipment.
EMPLOYMENT HISTORY	O. H. Materials Co., 1983 - Present Layne-New York Co., New England Div., 1977 - 1981, Driller/Mechanic
EDUCATIONAL BACKGROUND	B.S. Geosciences, University of Arizona, 1982 A.S. Business Administration, Becker Junior College, 1979

PROFESSIONAL PROFILE

RUSSELL R. DRERUP

TITLE Field Engineering Technician

EXPERTISE Mechnicial Technology/Drafting

EXPERIENCE Responsible for drafting project site plans involving physical layout of equipment, proposed well locations, scaling etc. Also experience in constructing geological cross-sections indicating boring characteristics, well screening information and geological strata.

Other drafting duties related to equipment construction, project schedules and treatment schematics.

Experience with drum sampling of unknowns and oil spill cleanup operations.

EMPLOYMENT HISTORY O.H. Materials Co., 1983 - Present

EDUCATIONAL BACKGROUND Associates Degree in Mechanical Engineering, Terra Technical College, 1982

PROFESSIONAL PROFILE

GREGORY D. GITHENS

TITLE

Environmental Scientist/Technical Development

EXPERTISE

Hazardous Waste Site and Spill Management, Proposal Development

EXPERIENCE

Responsible for conducting assessment, containment, cleanup, monitoring, and emergency response action at oil and hazardous material spills and dumpsites. Extensive field experience includes technical, administrative, and supervisory responsibilities.

Developed proposals and quotations for pollution control services, RCRA audits, waste site investigations and closures, groundwater investigations, spill contingency planning, and other environmental services.

Experienced in groundwater recovery and treatment of numerous chemicals.

Directed several biodegradation projects involving design and operation of on-site biological treatment faciilities and mobile microbiological laboratory.

Performed statistical analysis of contamination trends in long-term groundwater cleanup.

EMPLOYMENT HISTORY

O.H. Materials Co., 1983 - Present

O.H. Materials Co., 1978 - 1980, Environmental Specialist

EDUCATIONAL BACKGROUND

Master of Environmental Science, (specialization in Toxic and Hazardous Substances), Miami University, 1982

B.S. Microbiology, Ohio State University, 1978

PROFESSIONAL REGISTRATIONS & AFFILIATIONS

National Association of Environmental Professionals

Numerous publications related to hazardous materials spill management