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PHASE II
RESPONSE ACTION WORK PLAN

FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA

RECEIVED
NOV 6 1987
U.S. EPA REGION V
WASTE MANAGEMENT DIVISION
HAZARDOUS WASTE ENFORCEMENT BRANCH

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November 1987
Ref. No. 1916

CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

1.1 GENERAL

The former P.R. Mallory plant site (Site) is located approximately three miles east of Crawfordsville, Indiana in Montgomery County (Figure 1.1). Situated on land currently owned by Terra Products Inc. (Terra) and Superior Moving and Storage Co. (Superior), the Site is bordered by State Road No. 32 to the south and Little Sugar Creek to the north. The remaining plant floor slab, pumphouse, and incinerator from the former operation lie between the present Terra and Superior facilities and are directly southwest of the ravine which traverses the properties (Plan 1).

P.R. Mallory manufactured dielectric capacitors at the Site from 1957 to 1969. During this period, fabricated capacitor shells were filled on-Site with a variety of dielectric fluids including oils containing polychlorinated biphenyls (PCB). Operations were temporarily suspended in 1968 as a result of a fire which destroyed the impregnation room in the northeast section of the plant. After resuming operations, the plant operated until 1969 when a second fire nearly destroyed the entire plant.

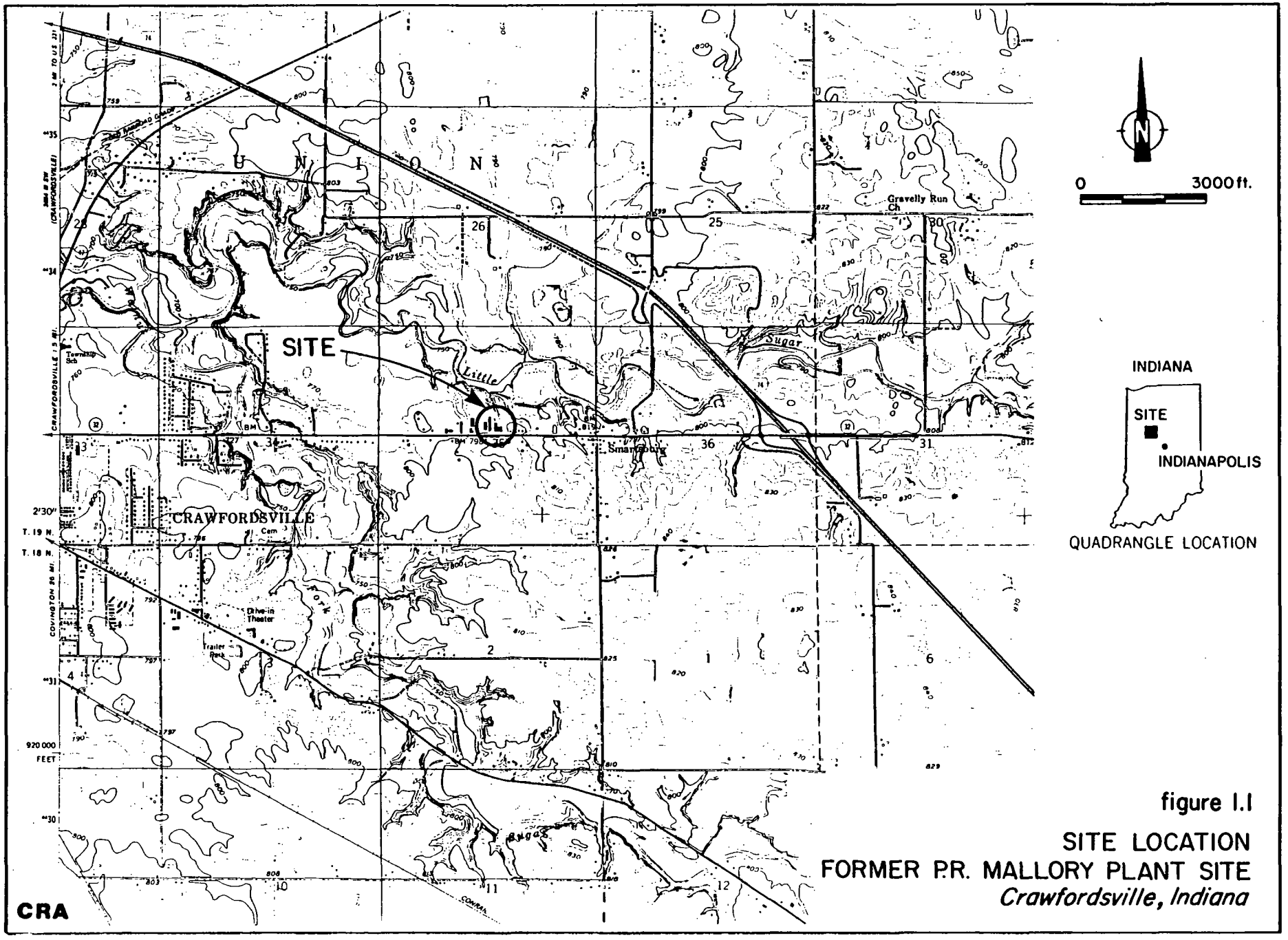

figure 1.1

SITE LOCATION
FORMER P.R. MALLORY PLANT SITE
Crawfordsville, Indiana

1916-25/10/87-17-D-0

In 1986, subsequent to a preliminary site investigation and evaluation, the United States Environmental Protection Agency (EPA) issued an amended Administrative Order, dated August 20, 1986, which required the respondents (Duracell International Inc., Terra Products Inc., and Superior Moving and Storage Co.) to undertake emergency removal and remedial activities at the Site. Duracell initiated the Phase I Response Action Plan, as approved by EPA and the Indiana Department of Environmental Management (IDEM) in December 1986.

Duracell proposes to implement the Phase II Response Action Work Plan (Phase II RAWP) presented in this document in response to the amended EPA Administrative Order. The Phase II RAWP addresses additional response actions not performed during Phase I and the additional data requirements necessary to properly define and evaluate final Site remedial options. This plan has been developed based on Site information and characterization data collected during implementation of previous response actions.

1.2 BACKGROUND

The site investigations and emergency response activities implemented to date were pursuant to the Administrative Order issed by EPA. The following briefly

describes the chronology of events leading to the final Order.

On October 10, 1985, the Indiana Department of Environmental Management (IDEM) conducted a site investigation at the former facility. During the Site inspection, IDEM staff located an area where capacitors had been discarded adjacent to the ravine and identified capacitors lying on the ground in the vicinity of the former plant. IDEM subsequently collected three intact capacitors from the disposal area on April 15, 1986 and analyzed the contents for PCB. Analysis resulted in reported concentrations as high as 100 percent PCB.

EPA was requested by IDEM to initiate a site investigation and removal action at the former facility. On April 19, 1986, EPA representatives conducted a preliminary soil and stream sediment sampling program. Analysis of the collected samples indicated concentrations of PCB ranging from 326 ppm in a control sample to 165,402 ppm in a soil sample taken from within the capacitor disposal areas. Based on the site assessment, EPA issued an Administrative Order dated June 23, 1986 to Duracell (the successor to P.R. Mallory) being the former site owner and operator and to Terra Products Inc., the present property owner. A subsequent Site survey identified the apparent disposal area as lying outside of land owned by Terra on land owned by

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Superior. Consequently, on August 20, 1986, EPA issued an amended Administrative Order (under the authority of Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601 et. seq.) which included Superior as a respondent, thereby providing access to the capacitor disposal areas.

Subsequent to issuance of the EPA Order, the State of Indiana filed a separate Complaint and proposed Order under authority of IC 13-7-11 of the Indiana Environmental Act against the respondents named in the EPA Order, also requiring removal and remedial activities at the Site.

1.3 WORK COMPLETED TO DATE

Work completed to date has substantially addressed the immediate removal response and site investigation requirements of the EPA Administrative Order and IDEM Complaint and proposed Order. Activities have been implemented in phases, consisting of several remedial and investigative programs. Briefly, the work performed under each program is summarized as follows:

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i) Initial Site Screening Sampling Program -

Soil samples were collected in the apparent capacitor disposal areas above and in the ravine, and adjacent to the plant slab and incinerator. Sample analyses confirmed the presence of elevated concentrations of PCB in these areas and indicated that secondary contaminants of concern were chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs).

ii) Phase I Remedial Construction -

Measures were implemented to prevent public access to contaminated areas and to minimize the potential for off-Site releases of contaminants. Specific activities included: erection of a security fence encompassing suspected areas of contamination, excavation of the apparent capacitor disposal areas with soil and capacitors secured in an on-Site interim storage cell, removal and decontamination of miscellaneous scrap and debris, securement of excavated areas with high density polyethylene (HDPE) overliners, installation of a sediment trap and oil absorbent boom in the ravine, and installation of seven groundwater observation wells.

iii) Phase I Sampling and Analysis Program -

The Phase I sampling and analysis program was

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conducted concurrently with the Phase I remedial construction. Collected samples of soil, sediment, concrete, surface water, groundwater and ambient air were analyzed for selected analytical parameters. All sample matrices were analyzed for PCB. Additional parameters consisted of: CDD and CDF for soil, sediment, and surface water samples; lead and cadmium for selected soil and sediment samples; volatile organic compounds (VOCs) and base/neutral acid extractables (BNAs) for selected soil samples; pH, conductivity, and dissolved oxygen for surface water samples; and general groundwater parameters, VOCs, CDDs, and metals for groundwater samples. The reported analytical results indicated that soils were primarily PCB affected with limited CDD/CDF contamination, ravine surface waters contained detectable levels of PCB and that contaminant releases to groundwater and ambient air were not of concern.

iv) Phase I Supplemental Sampling and Analysis Program - Upon completion of the Phase I sampling program and a review of the data generated, the Phase I supplemental program was implemented to address additional data requirements and to verify the results of the preceding program. Supplemental sampling was conducted to aid in delineating the areal and vertical extent of PCB affected soils, sediments, and surface

water. In addition to analysis for PCB, supplemental analyses were also conducted for lead, cadmium, VOCs, and CDD/CDF on selected soil and sediment samples, and pH and conductivity for surface water samples. An additional round of groundwater sampling was conducted as part of the supplemental program to confirm the results of the initial sampling round. Groundwater analytical parameters included PCB, CDD/CDF, VOCs and general geochemical parameters. The areal extent of the groundwater investigation was expanded in this program by including sampling of Terra Products and Superior Moving's water supply wells. The results of the supplemental program aided in further delineation of affected areas and provided further verification of the groundwater results from Phase I.

A more complete description and discussion of the work activities completed to date and the site characterization data are presented in the final reports pursuant to each of the aforementioned programs.

2.0 SCOPE OF WORK

The scope of work proposed for the Phase II Response Action Work Plan includes measures to reduce the exposure of the public to unsecured areas of potential contamination and to minimize the potential for off-Site contaminant releases. As such, Phase II will be a continuation of the immediate response and Site characterization/delineation activities conducted to date.

The proposed work program is necessary to fully secure the Site and to collect additional information for formulation of final remedial alternatives. In consideration of the greater quantities of material requiring removal than previously anticipated, the proposed work is essential to developing precise removal quantity estimates which will have a significant influence in the selection of a cost-effective remedial alternative.

The specific objectives of the Phase II work program are to:

i) mitigate potential hazards to the public by removing soils containing elevated levels of PCB which are located in unsecured areas outside of the existing security fence,

ii) mitigate sediment and oil migration down the ravine which, if left in an uncontrolled state, could lead to off-Site contaminant releases,

iii) eliminate the potential for continuing contaminant releases to the ravine from pipes discharging to the ravine slopes,

iv) define the vertical extent of contamination at previous soil sampling sites where significant PCB concentrations were found in underlying soil samples,

v) investigate and evaluate the extent of groundwater contamination, if any, in the former on-Site water supply well, and

vi) confirm the groundwater analytical results by conducting an additional sampling round of previously sampled wells.

The remedial and investigative components of the Phase II program will be executed in such a manner as to fully satisfy these objectives.

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3.0 PHASE II WORK PLAN

3.1 GENERAL

The Phase II response action program is comprised of two parts, including a remedial construction component and an investigative component. Both components will be implemented concurrently during Phase II work.

The remedial construction component will include:

i) construction of a second interim storage cell,

ii) construction of a wastewater tank containment pad,

iii) construction and installation of a series of sediment traps and oil absorbent booms in the ravine,

iv) excavation of soil from portions of the ravine upstream of the fenced area,

v) excavation of soil from portions of Superior's property immediately adjacent to the fenced area,

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vi) installation of HDPE liners over the excavated areas and backfilling, where appropriate, after conducting confirmatory sampling,

vii) tracing and subsequent plugging, where appropriate, of pipes which discharge to the ravine, and

viii) dismantling and removal of the former water supply pumping system.

The investigative component will include:

i) sampling of soils from locations where residual PCB contamination was previously detected in underlying soil samples,

ii) additional sampling of ravine soils and sediments,

iii) development and sampling of the former on-Site water supply well, and

iv) sampling of the existing Phase I observation wells and Terra and Superior's water supply wells.

Upon completion of both components of the Phase II work program, a Phase II final report will be submitted to EPA and IDEM detailing the completed remedial

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activities and presenting the collected analytical results. A more complete description of the RAWP activities are presented in the following sections.

3.2 REMEDIAL CONSTRUCTION - WORK DESCRIPTION

3.2.1 General

All remedial construction activities will be carried out in strict compliance with the health, safety and site control requirements detailed in Appendix B.

Duracell will solicit bids from qualified remedial contractors to undertake this component of the Phase II program. Where appropriate, the services of the selected remedial contractor will also be used in implementing the investigative component of the work program. The various remedial tasks to be implemented are illustrated on Plan 2 and outlined in the following sections.

3.2.2 Construction Startup

Prior to initiation of excavation and removal activities, the Contractor shall:

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i) construct an entrance pad to the Clean Zone and an exit pad from the existing decontamination pad;

ii) provide personnel decontamination, personnel hygiene and office facilities on Site;

iii) delineate controlled areas on Site with fencing in accordance with the requirements of the Site control plan (Appendix B);

iv) provide the necessary equipment to operate the decontamination pad, including two storage tanks for temporary storage of decontamination wash waters and excavation dewatering waters;

v) secure the portion of the ravine scheduled for excavation with fencing;

vi) secure the portion of Superior's yard to be excavated with fencing (to be completed immediately prior to excavation in this area); and

vii) decontaminate and relocate the existing storage shed to the plant slab.

The proposed entrance and exit pads will minimize the migration of contaminants into the Clean Zone

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and off Site by preventing vehicle contact with the underlying soil. The pads will be constructed by overlaying a sheet of filter fabric, placed on grade, with clean gravel.

All personnel decontamination, hygiene and office facilities will be located on the existing plant slab. Storage tanks will also be placed on the slab adjacent to the decontamination pad as shown on Plan 2.

3.2.3 Ravine Contaminant Migration Control

Contaminant migration through the ravine will be controlled by a series of sediment traps and oil absorbent booms as shown on Plan 2. A total of four sediment traps and four booms is proposed.

Sediment traps will be constructed to encompass the full width of the stream bed where possible. Each sediment trap will be constructed by first excavating a shallow trench in the proposed trap location, then laying a sheet of filter fabric over the excavation. Hay bales will be placed on the prepared base and the filter fabric will be wrapped up and over the front face of the bales. Each constructed sediment trap will be anchored in place with stakes (Figure 3.1).

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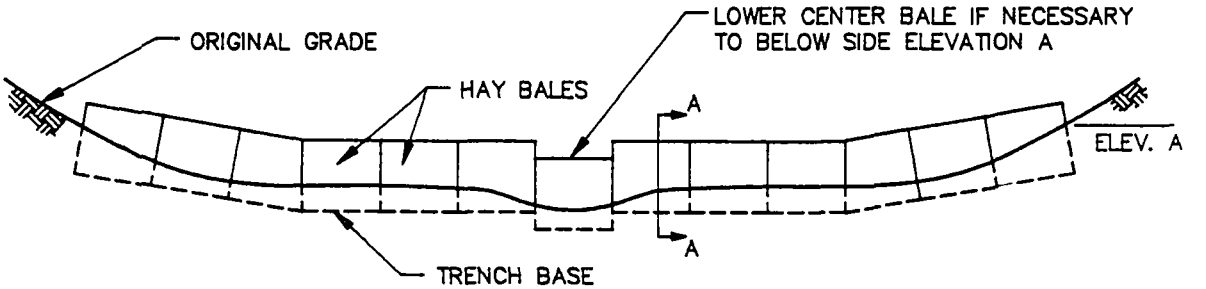
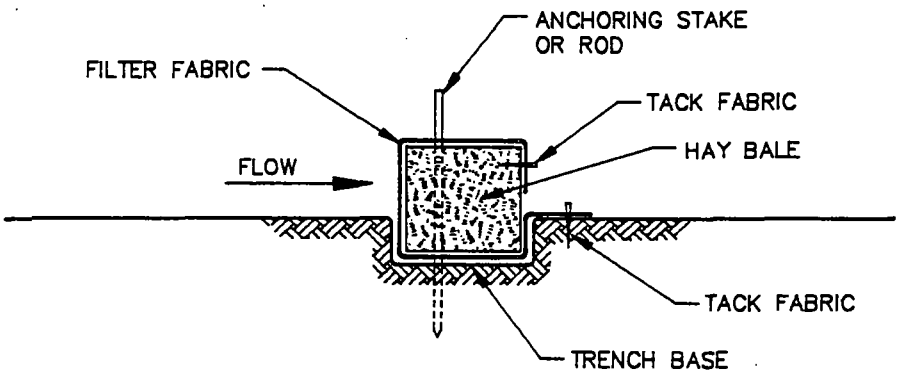


TYPICAL PROFILE



SECTION A–A

figure 3.1

SEDIMENT TRAP CONSTRUCTION DETAIL
FORMER P.R. MALLORY PLANT SITE
Crawfordsville, Indiana

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An oil absorbent boom will be installed in the potential pool area upstream of each sediment trap. The booms will be secured in place by stakes driven in each end of the boom.

The existing sediment trap and oil boom will be removed and placed in the interim storage cell.

3.2.4 Wastewater Tank Containment Pad

Storage tanks to be situated on the existing slab shall be placed within a containment pad to prevent accidental releases from spillage or leakage. During construction of the pad, the working area on the existing plant slab shall be designated as a temporary clean zone.

The containment pad will be constructed by first removing protrusions and smoothing irregularities on the plant slab. A shallow sump shall be excavated in the existing plant slab. A sheet of 60-mil HDPE will then be laid directly on the prepared base. The edges of the HDPE sheet will be folded over lumber curbing placed around the perimeter of the HDPE sheet in such a manner as to form a containment cell. Wood sheeting will be placed on top of the HPDE to act as a wearing surface.

3.2.5 Interim Storage Cell Construction

The Phase II interim storage cell shall be constructed on the existing plant slab in the location shown on Plan 2. During construction of the cell, the working area on the existing plant slab shall be designated as a temporary clean zone in accordance with the Site control plan (Appendix B).

Prior to construction, clean materials used to anchor the south edge of the liner over the existing storage cell will be removed to temporary storage on the slab. The liner will be reanchored by concrete nailing a lumber edge strip in place and the excess liner will either be trimmed or folded back.

Over the area of the proposed cell, the surface of the existing slab shall be cleared and prepared by removing sharp protrusions and smoothing irregular surfaces with clean sand. The concrete sump shall be constructed by excavating through the existing plant slab. During sump construction, soil samples shall be taken from the soil underlying the slab. A 60-mil HDPE liner shall be placed directly on the prepared surface and into the constructed sump and a new concrete floor and curbing shall be poured in place on top of the liner.

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3.2.6 Site Clearing

Trees and shrubs will be cleared to facilitate access to the upstream portion of the ravine scheduled for excavation. Clearing will proceed downstream from the existing ravine crossing to the fence and upstream to a point immediately upslope of the required excavation. Clearing will not proceed beyond this point in order to maintain a wooded buffer zone between Superior's facilities and the proposed excavation area.

Trees and brush will be cut to a minimum height of 18 inches above grade and loaded directly onto trucks for removal to disposal in a municipal landfill or stockpiled on a clean portion of the Site. Stumps which must be removed or trimmed will be considered potentially contaminated and will be placed in the constructed interim storage cell.

3.2.7 Testing/Plugging of Ravine Discharge Lines

Four known existing culverts/pipes discharge to the ravine as shown on Plan 2. The originating point of these lines is not presently known, although the CMP, plastic tile drain and ceramic tile drain in the northwest corner of the Site appear to drain the field west of the ravine and

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Terra's yard. The alignment of the discharge ends of the plastic tile drain and ceramic tile drain indicate that they may originate from the former plant facility or traverse potentially contaminated areas.

An effort will be made to delineate the CMP and two tile drains by surficial exploratory methods. These may include magnetometer, audiometric, and flush test methods where appropriate. The discharge end of these lines shall be plugged at the ravine unless the investigation shows the lines to be active and essential to existing operations.

Superior will be consulted for information concerning the origin and alignment of the plastic discharge pipe adjacent to their facility. Should no information be available, potential sources from Superior's facility such as floor and roof drains will be flush-tested in an attempt to locate the point of origin. A decision as to whether or not to plug the discharge end at the ravine will be made in consultation with the on-Site agency representative following this investigation and the work described in Section 3.3.2.

Plugging will be performed by casting a cement plug in the open discharge end of the pipe. Additional work to be performed in delineating the lines is presented in Section 3.3.2.

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3.2.8 Ravine Excavation and Securement

Prior to excavation of the ravine, fencing shall be erected to encompass the area as shown on Plan 2. The security fence immediately west of the ravine bank will be temporarily breached to provide access to the working area via the existing cleared path. To minimize tracking potentially contaminated soil along the access route, the path between the security fence and the ravine bottom will be upgraded by laying six inches of gravel over a sublayer of filter fabric and plastic sheeting. The fill and culvert previously placed in the ravine will be removed to the interim storage cell and treated as potentially contaminated material. In advance of ravine work, a temporary sediment trap and oil boom will be placed immediately downstream of excavation area A, inside the fence, to contain contaminant migration during excavation.

Soils in the upstream portion of the ravine, with PCB concentrations potentially greater than 500 ppm, will be excavated and transported to the interim storage cell. The proposed areal and vertical extent of the excavation is shown on Plan 2 as excavation area A. Excavation will begin at the top end of the area and proceed down towards the existing access path in a manner such that the Contractor's equipment and personnel do not track over the surface of the excavated area. The contaminated soil

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between the existing access path and the fence will be excavated by starting at the downstream end and proceeding upstream. The excavation immediately adjacent to the access path will be performed last to allow the backhoe to move onto the access path without tracking over excavated surfaces. Excavated soil will be placed in the interim storage cell in accordance with Section 3.2.10.

Upon completion of excavation, confirmatory soil samples will be collected from the excavated surface in accordance with Section 4.0. Runoff waters which may have collected in the open excavation will be transferred to tanker storage and the excavation will be lined. A 40-mil HDPE liner will be placed over the area starting from the top end of the excavation. The liner will be secured by trenching at the upper end and the side edges staked in place as the liner is unrolled down the ravine. Clean fill will be placed in the excavation adjacent to the fence, under the liner, as required to prevent ponding.

The breach in the security fence will be repaired and the temporary oil boom and sediment trap will be removed and placed in the interim storage cell upon completion of the required ravine excavation and securement.

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3.2.9 Superior Yard Excavation and Securement

Gravel and soil containing elevated concentrations of PCB in Superior's yard, adjacent to the fenced Site, will be excavated and placed in the interim storage cell. The areal and vertical extent of the proposed excavation is shown on Plan 2 as excavation area B.

Prior to excavation, the area will be secured with fencing as shown on Plan 2. The security fence which traverses the area to be excavated will be temporarily dismantled, spray cleaned and stored on the existing plant slab. Soils from depth zone 1 (Plan 2) will be removed starting from the east edge of the excavation area and proceeding west toward the Site yard. Soil over the full depth of depth zone 1 will be removed and placed in the interim storage cell at one time. Excavation in successive lifts over the areal extent of the excavation area shall not be permitted. Soil from the top 1-foot of depth zone 1 shall be handled separately from the underlying depth zone 1 soil. Material from the top 1-foot will be taken to the storage cell separately for segregated handling in accordance with Section 3.2.10. Tracking of vehicles over excavated surfaces shall be prohibited and placement of contaminated material onto excavated surfaces shall be prevented. The backhoe bucket shall be decontaminated prior to removing the final four to six inches from depth zone 1, as directed by the Engineer.

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Soil to be excavated from depth zone 2 is potentially clean material and will be handled accordingly. Decontaminated equipment shall enter the excavation from the east edge through the fence and excavate soil from depth zone 2 from west to east. The soil will be transported around the perimeter fencing into the Site yard for segregated storage in the interim cell. To prevent subsequent contamination of this soil, any equipment used to handle the material in the cell will be decontaminated beforehand. The soil will be placed on a continuous plastic sheet wrapped over timber edge curbs. The stockpile will be sampled (Section 4.0) and covered with plastic sheeting. Should insufficient capacity be available in the storage cell, the excess will be stored in a clean area of the Site in the same manner as described above.

Upon completion of excavation, confirmatory soil sampling of the excavated base shall be performed in accordance with Section 4.0 prior to liner placement. A 60-mil HDPE liner shall be placed over the excavation surfaces including vertical or sloped faces within and around the excavation. The excavation will be backfilled with clean imported fill. Prior to removing the snowfence, the site security fence will be reconstructed using the dismantled fencing materials.

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3.2.10 Interim Storage Cell Handling/Staging

Segregated material handling will be practiced in the interim storage cell in the event that an approved off-Site disposal option becomes available either prior to or during implementation of the Phase II RAWP.

Stockpile material will be segregated to distinguish between materials from different originating excavation areas and materials with anticipated differences in the type and degree of contamination. This will facilitate the implementation of any final disposition options for the stored material either in this phase or later phases of work. Soil piles requiring segregation include: soil from the uppermost 1-foot of depth zone 1 from excavation area B, the remainder of the depth zone 1 soil from excavation area B, depth zone 2 soil from excavation area B, soil from excavation area A, and the removed fill from the ravine. The soil from the lower portion of depth zone 1 from excavation area B, from excavation area A and from the removed fill shall be placed in a common pile.

Soil piles will be segregated by placing lumber curbs in the interim storage cell to divide abutting stockpiles. To prevent cross-contamination, any equipment used to handle the soil in the cell will be decontaminated prior to handling different material piles.

Prior to off-Site disposal of any soil, the soil to be disposed of shall be sampled and analyzed in accordance with Appendix A to confirm the appropriateness of the proposed disposal option.

3.2.11 Dismantling of the Water Supply Pump

Dismantling of the former water supply pumphouse, pump and piping is required to provide access to the well for the investigative component of the work plan. The pumphouse roof will be temporarily removed and the well secured before any sampling is conducted.

Prior to removal of the roof, the discharge piping will be disconnected and the end of the pump discharge pipe capped. The roof will be removed and placed in temporary storage in the interim cell. The pump will be disconnected and hoisted out of the pumphouse and placed on the decontamination pad. After disconnecting the discharge elbow, the shaft and impeller assembly will be hoisted out of the casing if possible and also relocated to the decontamination pad. A steel pipe sleeve will be installed over the existing casing. The steel sleeve shall be set in concrete or grouted in place as necessary. To secure the well, a removable steel cap will be installed over the installed sleeve complete with a padlock. Upon completing

securement of the well, the pumphouse roof will be reinstalled. Removed pump and pipe components will be decontaminated and stored in the interim storage cell pending confirmatory wipe sampling and analysis.

3.2.12 Construction Closeout

Construction closeout will consist of the removal of the Contractor's equipment and facilities, disposal of tanked waters, and securement of the interim storage cell.

The liquid waste tankers will be hauled to an approved wastewater treatment facility and the interim storage cell shall be secured with a 60-mil HDPE overliner. The liner edges shall be anchored using lumber strips concrete nailed or bolted to the existing plant slab.

3.3 INVESTIGATIVE PROGRAM - WORK DESCRIPTION

3.3.1 GENERAL

All investigative work activities will be carried out in strict accordance with the health, safety and site control requirements contained in Appendix B.

Specific work tasks to be conducted in this portion of the Phase II RAWP include:

i) delineation of potentially contaminated underground lines discharging to the ravine,

ii) soil sampling below the discharge end of culverts/pipes ending in the ravine,

iii) further soil sampling where the vertical extent of contamination was not demarcated by the work of previous programs,

iv) soil and sediment sampling to define the width of the potentially contaminated zone in the ravine,

v) sampling of the former water supply well,

vi) sampling of the existing observation wells, and

vii) sampling of Terra's and Superior's water supply wells.

These activities are described in greater detail in the following sections. The sampling and analysis to be conducted in the RAWP investigative component is summarized in Section 4.0 in conjunction with the confirmatory sampling and analysis program.

3.3.2 Delineation of Ravine Discharge Lines

Pursuant to the work of Section 3.2.7, underground lines identified or suspected of traversing potentially contaminated areas will be further delineated, if necessary, by excavating test pits and trenches with a backhoe.

Excavation will proceed in a manner, as directed by the field Engineer, which will trace the line in question from its discharge point in the ravine to its origin or until it is evident the line does not traverse the potentially contaminated zone. Each test pit and trench excavation will continue both vertically and laterally, as required to delineate the pipe alignment. As the excavations progress, observations will be recorded regarding depth of fill over pipe, condition of pipe, and any visible indications of soil and/or water contamination.

In excavation areas where contamination is not anticipated, excavated overburden will be stockpiled on plastic sheeting adjacent to the pit. Soil excavated from the immediate vicinity of the pipe will be placed in a separate pile from clean overlying soil. Backfilling will be in reverse sequence to return soil to their approximate original depth zones. Should visibly stained soil be encountered, it will be sampled and placed in the interim

storage cell. The backfill volume deficit will be made up with clean fill.

In zones of known contamination, within the fence, excavated overburden will be placed either directly on grade or on plastic sheeting. Top and bottom material will be piled separately on opposite sides of the excavation. Top material, known to be contaminated, shall be placed on grade. Bottom material, below the depth of known contamination, shall be placed on plastic sheeting. Backfilling will be in reverse sequence with any excess material due to soil bulking removed and placed in the interim storage cell.

Test pit and trench excavations will be conducted in such a manner that only the backhoe bucket will require decontamination in the event that contaminated soil is encountered. The backhoe bucket will be decontaminated between successive pit and trench locations. Where contaminated overburden is encountered in excavations outside of the fence, the backhoe bucket will also be decontaminated prior to handling clean backfill.

During excavation in areas where contamination is not anticipated, the backhoe shall be directed to operate in such a manner as to minimize accidental breakages of the underlying pipe. Should

breakages occur, the ends of the broken pipe will be plugged with cement prior to backfilling.

3.3.3 Soil and Sediment Sampling

Soil and sediment samples shall be collected from the locations shown on Plan 2.

The proposed sampling stations in the vicinity of the plant slab and incinerator are located where the previous sampling programs detected significant concentrations of PCB (typically greater than 500 ppm) in the lowest sampled depth zone. Soil sampling shall be continued at these locations to delineate the vertical extent of residual contamination. Soil above the first zone to be sampled will be excavated with a backhoe. To minimize the potential for cross-contamination of samples, the backhoe bucket will be decontaminated before removing the last six inches overlying the first sampling zone; the last inch of soil overlying the sampling zone will be removed manually.

Samples will be collected manually using hand tools or a split-spoon sampler in accordance with the protocols outlined in Appendix A. Where excavations need to be deepened to facilitate collection of deeper samples, the additional excavation work will follow the preceding precautions.

The sampling locations shown in the ravine (Plan 2) are for delineating the width of the affected zone and the potential depth of contamination. The samples were selected to coincide with locations where significant PCB concentrations were previously detected in the stream bed. At locations SD-15 and SD-19 (former sampling points) samples will be taken offset from the center of the stream bed on both sides. The offset sampling points will be located such that they lie within the zone which is less than 1-foot higher in elevation than the original stream bed sampling point. In addition, an attempt will be made to collect deeper samples from the previously sampled SD-15 location.

Soil samples will also be collected immediately below the discharges for the pipes/culverts ending in the ravine. Sample locations will be situated below the exposed pipe invert and above the stream bed in the flow path from the pipe discharge.

3.3.4 Water Supply Well Investigation

After measurement of the static water level in the existing water supply well, the well will be sampled and response tested in accordance with the protocols presented in Appendix A. Well development fluids will be contained for analysis and subsequent disposal. Samples will be collected for PCB and HSL VOC analyses.

3.3.5 Observation Well Sampling

All on-Site observation wells installed in Phase I and Terra's and Superior's wells will be sampled and analyzed for PCB. Additional samples will be collected from well OW4B-86 for CDD and CDF analyses. Prior to sampling, the static water level will be measured in each of the installed observation wells. Sampling shall be conducted in accordance with Appendix A.

3.4 WASTE HANDLING

All waste materials generated during the implementation of the RAWP shall be handled appropriately for the anticipated contaminant hazard.

Waste soils and sediments from decontamination will be placed in the interim storage cell; discarded personal protective equipment (PPE) will be secured in plastic garbage bags and placed either in an on-Site lugger box or in steel drums. Visibly stained or soiled PPE and PPE used in contact with contaminated material shall be placed in steel drums. Clean PPE shall be placed in the on-Site lugger box. Liquid wastes shall be segregated between a clean waste tank and a potentially dirty waste tank. Only shower waters and well development fluids shall

be stored in the clean waste tank. Decontamination wash waters and waters from excavation dewatering shall be stored in the potentially dirty waste tank. Upon project closeout, or earlier should the tanks become full, the tanks' contents will be sampled and analyzed to determine the appropriate final disposition for the stored liquids.

Drummed purge waters from previous well development activities, currently stored on-Site, shall be used to supplement water used for dust control. Only drummed waters containing non-detectable concentrations of PCB will be used for this purpose.

3.5 FINAL REPORT

Following completion of the RAWP, Duracell will submit a final report to EPA and IDEM. The report will consist of two volumes, a remedial construction report and an investigative report, submitted under separate cover.

The remedial construction report will include:

i) a chronology and description of the remedial construction implemented,

ii) identification of any variances from the original RAWP,

iii) identification of problems encountered and how they were resolved, and

iv) an inventory of quantities and types of materials removed and their ultimate disposition.

The investigative report will include:

i) a compilation of all analytical results produced during the program,

ii) identification of underground lines, and

iii) recommendations for any additional investigative actions which may be required in developing the work to be conducted in future work phases.

4.0 SAMPLING AND ANALYSIS PROGRAM

4.1 GENERAL

Sampling and analysis of surfaces and soil/liquid matrices are required during RAWP implementation for both investigative and confirmatory purposes. The investigative sampling, previously discussed in Section 3.3, is summarized in this section in conjunction with the additional confirmatory sampling requirements. Sampling locations, where applicable, are shown on Plan 2. All sampling and analysis will be conducted in accordance with the protocols of Appendix A.

4.2 SAMPLING PROGRAM

The samples to be collected are categorized as confirmatory or investigative samples. Confirmatory samples include soil samples collected from the exposed surface of excavated areas and additional sampling as required for determining the appropriate disposition of the excavated or removed materials. Surface wipe samples of the water supply pump and liquid samples of tank waters are required prior to off-Site disposal of these items. Investigative samples collected for Site characterization purposes include those discussed in Section 3.3 and others

collected in conducting the remedial work of Section 3.2. Additional sampling may be required to assess the acceptability of excavated contaminated soil for off-Site disposal.

Table 4.1 summarizes the total number of samples presently anticipated to be collected under this program. Additional samples shown as required for quality control are in accordance with the requirements of Appendix A.

4.3 ANALYTICAL PROGRAM

The analytical program to be conducted on the collected samples will consist of analysis for PCB, CDD, CDF, and HSL VOCs, as appropriate. Tanked liquids scheduled for off-Site disposal will also be analyzed for BNAs as required for proper waste identification and transport manifesting. Two levels of analytical reporting effort is required for PCB analysis for soils, depending on whether the sample is for investigative or confirmatory purposes. The specific analytical methodologies and protocols to be followed are detailed in Appendix A. The analytical parameters and level of analysis is indicated in Table 4.1.

TABLE 4.1

SAMPLING AND ANALYTICAL PROGRAM SUMMARY

Sample Location	Sample Matrix	Required Analysis	Investigative Level Samples	Confirmatory Level Samples	Field Blanks	Field Duplicates	Matrix Spike	Total
A. Investigative Samples								
Former Plant Yard	Soil	PCB	18	-	2	2	1	23
Pipe Discharge Zones	Soil	PCB	4	-	1	1	-	6
Ravine	Soil	PCB	6	-	1	1	1	9
Phase II Interim Storage Cell Sump	Soil	PCB	2	-	-	-	-	2
Discharge Line Bedding[a]	Soil	PCB	4	-	-	1	-	5
Water Supply Well[b]	Groundwater	PCB/VOC	2	-	1	1	1	5
Phase I Observation Wells	Groundwater	PCB	7	-	1	1	1	10
Terra & Superior Wells	Groundwater	PCB	2	-	-	-	-	2
Well OW4B-86	Groundwater	CDD/CDF	1	-	-	1[f]	-	1
Subtotal			46	-	6	8	4	64
B. Confirmatory Samples								
Excavation Area A	Soil	PCB	-	4	1	1	-	6
Excavation Area B	Soil	PCB	-	4	1	1	1	7
Excavation Area B Potentially Clean Stockpile	Soil	PCB	-	4	-	1	-	5
Pump and Assembly Surfaces[c]	Surface Wipes	PCB	-	3	1	1	1	6
Tanked Liquids[d]	Liquid	PCB/BNAs	-	2	1	1	1	5
Subtotal			-	17	4	5	3	29
TOTAL[e]			46	17	10	13	7	93

Notes:

(a) dependent on field observations and findings, minimum of 1 bedding material sample for each pipe
(b) two samples for PCB analysis, one sample to be analyzed for VOCs
(c) dependent on number of associated parts for disposal
(d) dependent on quantity for disposal
(e) anticipated minimum
(f) sample to be held and analyzed if investigative sample contains detectable concentrations of CDD/CDF

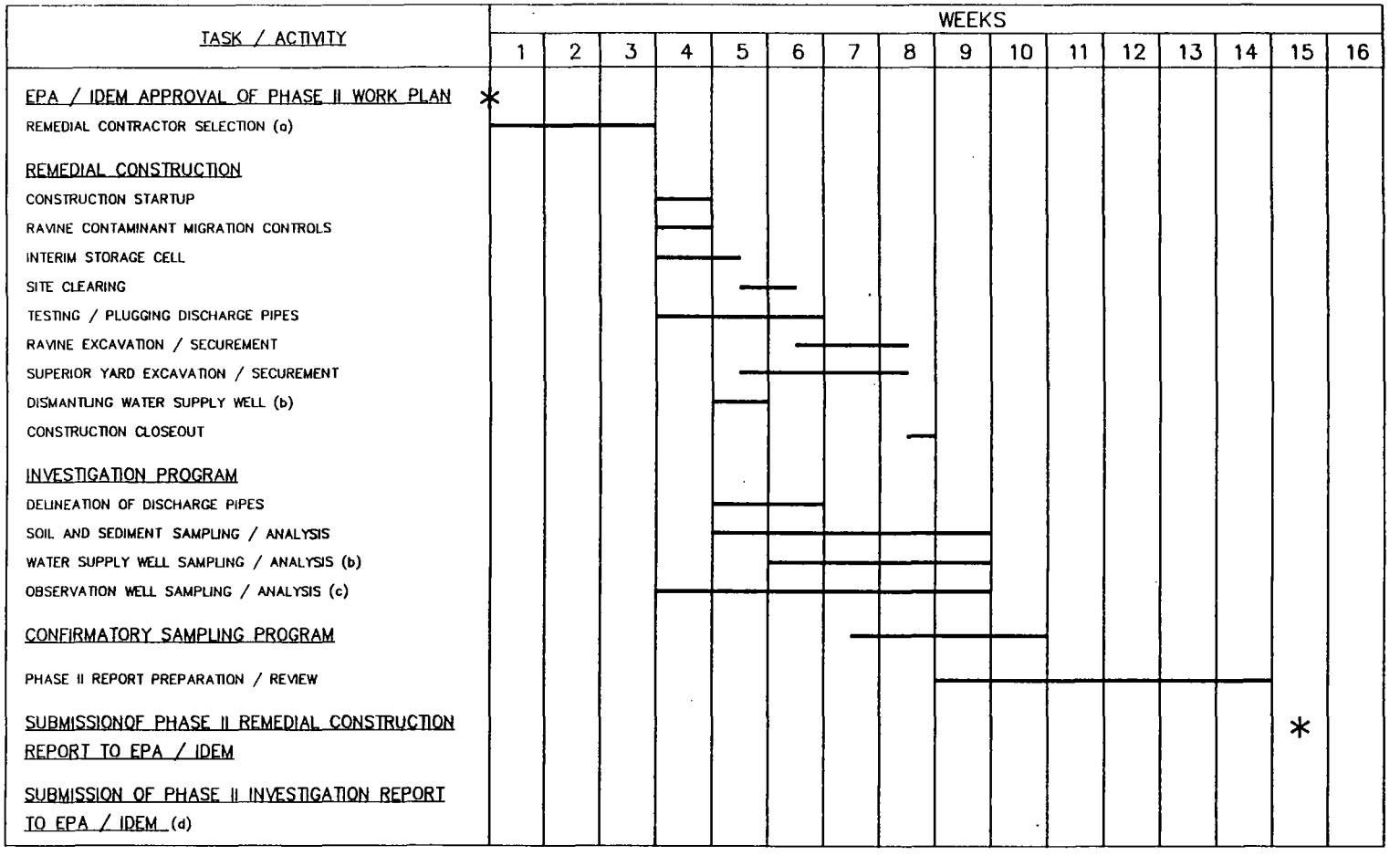
CONESTOGA-ROVERS & ASSOCIATES

5.0 DETAILED SPECIFICATIONS AND DRAWINGS

Detailed specifications and working drawings for the response action program will be submitted to EPA and IDEM to confirm they are consistent with the approved Phase II RAWP.

6.0 SCHEDULE

The proposed project schedule is illustrated in Figure 6.1. Schedule target dates are dependent on favourable Site and weather conditions and the time required for receipt of laboratory analytical results. Health and safety considerations for Site personnel and the general public will override any schedule requirements.



NOTES:

(a) DEPENDENT ON ANY MODIFICATIONS REQUESTED BY EPA / IDEM

(b) DEPENDENT ON DOWN HOLE CONFIGURATION OF WELL

(c) INCLUDING TERRA AND SUPERIOR'S WELLS

(d) WITHIN 21 DAYS OF RECEIPT OF ANALYTICAL DATA

figure 6.1

PROPOSED SCHEDULE
FORMER P.R. MALLORY PLANT SITE
Crawfordsville, Indiana

CRA

1916-27/10/87-17-D-0

7.0 HEALTH, SAFETY AND SITE CONTROL PLAN

The work to be conducted under the RAWP includes the handling of contaminated and potentially contaminated materials. During the program, personnel may come in contact with PCB, CDD, and CDF contaminated soils, liquids, and articles.

In implementing the RAWP, provisions for health and safety will be followed which are designed to ensure:

i) that personnel working on Site are not adversely exposed to hazardous substances,

ii) that the health and safety of the general public and the environment is not compromised by off-Site releases of hazardous substances, and

iii) compliance with applicable government and non-government regulations and guidelines.

In addition, based on available information from previous programs, a strict Site control plan will be implemented to prevent tracking of contaminants into clean areas on-Site and off-Site. The Health, Safety and Site Control Plan under which the RAWP will be implemented is presented in Appendix B.

8.0 REFERENCES

Conestoga-Rovers & Associates. 1986a. Initial Site Screening: Sampling Program, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1986.

Conestoga-Rovers & Associates. 1986b. Response Action Work Plan, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. October 1986.

Conestoga-Rovers & Associates. 1987a. Phase I Remedial Action Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. February 1987.

Conestoga-Rovers & Associates. 1987b. Hydrogeologic Investigation Interim Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. March 1987.

Conestoga-Rovers & Associates. 1987c. Phase I Sampling and Analysis Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. April 1987.

Conestoga-Rovers & Associates. 1987d. Hydrogeological Investigation Supplemental Data Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. July 1987.

Conestoga-Rovers & Associates. 1987e. Phase I Supplemental Sampling and Analysis Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1987.

APPENDIX A

SAMPLING AND ANALYSIS PROTOCOLS

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A.1 INTRODUCTION

The sampling and analysis plan for the Phase II RAWP includes the collection of samples from various matrices including: soil and sediment, surfaces, groundwater and tanked liquids.

Collected samples are intended for chemical analyses to either aid in characterizing and delineating affected on-Site areas, characterize materials prior to disposal, or confirm the effectiveness of any remedial/removal activities. Therefore, all sampling protocols shall be strictly followed to eliminate any potential cross-contamination of samples and to prevent sampling biases from affecting the analytical results.

Sampling activities may involve contact with materials containing hazardous substances. Therefore, all sampling activities shall be carried out in strict accordance with applicable health and safety protocols (Appendix B).

A.2 SOIL AND SEDIMENT SAMPLING

A.2.1 GENERAL

Soil and sediment sampling is required for investigative and confirmatory purposes. Samples will be taken either in situ from undisturbed locations and below excavated surfaces or from excavated soil stockpiles. The procedures to be followed for in situ and stockpile sampling are outlined in the following subsections.

A.2.2 EQUIPMENT DECONTAMINATION

All sampling equipment which may come in contact with potentially contaminated materials shall be decontaminated prior to field use and after each sample is collected to prevent cross-contamination of samples. Duplicate samples shall be collected concurrently with original samples, therefore, sampling equipment will not be decontaminated before collection of the duplicate. Decontamination will be performed as follows:

1. clean water wash to remove all visible foreign matter,
2. rinse with deionized water,
3. rinse with reagent-grade acetone,
4. rinse with 1,1,1-trichloroethane, and
5. air dry on a clean plastic sheet.

For confirmatory soil sampling, tools shall be cleaned with a pressure spray or scrubbed with a bristle brush prior to proceeding with Item 1.

Fluids used for cleaning shall not be recycled. All wash water, rinse water and decontamination fluids shall be placed in approved liquid drums for future disposal.

A.2.3 IN SITU SOIL SAMPLE COLLECTION

In situ soil and sediment samples shall be collected with a split spoon sampler or by hand as outlined below. At vegetated sample stations, samples shall be collected from below the vegetative root mat by first cutting away the mat with a clean utensil.

.1 Split-Spoon Samples

A split spoon sampler shall be used to retrieve soil and sediment samples, as outlined below:

1. A new pair of disposable latex gloves will be used at each sample location and for the preparation of samples from different vertical zones at each individual location.

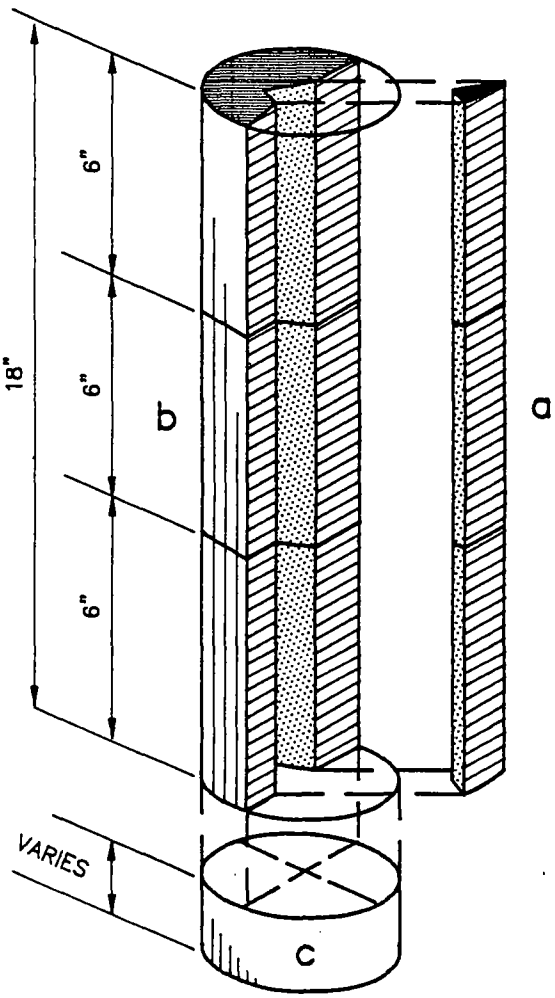
2. Prior to use at each sample location, all sampling equipment not previously decontaminated shall be cleaned in accordance with Subsection A.2.2.

3. A split-spoon sampler shall be manually driven into the ground to a depth greater than the required depth for sampling.

4. The split-spoon sampler shall be retrieved and opened upon a clean sheet of polyethylene or aluminum foil.

5. Using a clean cutting tool, the collected section below the required sample will be removed from the bottom of the core. The remaining core will be cut cross-wise to segregate the core into the required six-inch increments. The top six-inch core will be cut in half longitudinally. A continuous vertical sample shall be collected from the center of the exposed face of the top core as illustrated in Figure A-1. The sample will be removed using clean stainless steel spatulas, spoons or other appropriate sampling equipment. The sample shall be placed in a prelabeled 250-mL glass jar and sealed with a teflon lined cap.

6. A new pair of disposable latex gloves and clean sampling tools shall be used to prepare the sample from each of



TYPICAL SOIL CORE

a

PORTION OF SAMPLE FOR CHEMICAL ANALYSIS

- CONTACT WITH UNSTERILIZED MATERIALS IS NOT ACCEPTABLE
- CONTAINER: PRECLEANSED 250ml. AMBER GLASS
- GASKET – TEFLON OR ALUMINIUM FOIL
- STORAGE – REFRIGERATED (4°C)
- SHIPPING – ON ICE BY COURIER TO DESIGNATED LAB

b

PORTION OF SAMPLE TO BE RETAINED FOR GEOLOGIC RECORDS (IF REQUIRED)

- CONTACT WITH UNSTERILIZED MATERIALS IS NOT A PROBLEM
- CONTAINER: – CLEAN GLASS JAR
  – CLEAR GLASS IS SUITABLE
- GASKET – ANY SUITABLE GASKET
- STORAGE – IN STANDARD SHIPPING CARTON
  – NO REFRIGERATION REQUIRED

c

PORTION OF SAMPLE TO BE DISCARDED

figure A–1

SOIL SAMPLE COLLECTION DETAIL
FORMER P.R. MALLORY PLANT SITE
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the underlying six-inch cores in accordance with the procedures described for preparation of the upper core sample.

7. If necessary a second core shall be collected immediately adjacent to the first to retrieve sufficient material for analyses. Where a second core is required for analyses or as a duplicate sample, the collected samples shall be composited and homogenized in a clean stainless steel bowl prior to being placed in the sample jars.

8. All equipment used during sampling which may have come in contact with potentially contaminated soils, shall be decontaminated in accordance with Subsection A.2.2. Latex gloves used during the collection of the sample shall be disposed of in accordance with Section A.7.

.2 Manual Sample Collection

Manual sample collection shall be performed as follows:

1. A new pair of disposable latex gloves shall be used at each location.

2. Prior to use at each sample location, all sampling equipment shall be decontaminated in accordance with Subsection A.2.2.

3. A clean stainless steel knife or spoon shall be used to remove a sample over a two-inch diameter area from the upper six-inch layer of soil. The collected soil shall be placed in a clean, prelabeled glass jar and sealed with a teflon lined cap.

4. If deeper soil samples are to be taken manually from the same location, the following procedures shall be used:

   i) The soil surrounding the original sample zone shall be removed over approximately a 12-inch by 12-inch area to a depth of five inches with a clean shovel or trowel. The removed soil shall be placed beside the hole;

   ii) The remaining layer of soil over the zone to be sampled shall be removed with clean utensils;

   iii) The sample will then be collected from the underlying soil as in Item 3 above.

   This procedure will be repeated, if necessary, to collect deeper required samples.

Field blanks and field duplicates shall be collected concurrently with field samples. A field blank shall be collected for each set of ten samples collected. The field blank for soil and sediment samples shall consist of deionized water poured over the sampling tools after they have been decontaminated. Also, a field duplicate shall be collected for each set of ten samples. The field duplicate and investigative or confirmatory sample shall be taken from material homogenized in a clean stainless steel bowl.

.3 Sample Location Survey

All sampling locations will be marked in the field and identified by a specific location number. Each sample location will be surveyed and referenced to the horizontal controls previously established on Site.

A.2.4 SOIL STOCKPILE SAMPLE COLLECTION

Sampling of stockpiled soil is required to confirm the cleanliness of the material and/or suitability for further use or disposal. The soil has already been disturbed and mixed to a degree, therefore, the procedures used to obtain representative samples from in situ soils are not applicable in this situation. Four samples shall be

collected from each of the four different compass directions for each stockpile requiring sampling as follows:

1. A new pair of disposable latex gloves shall be used at each sample location for the preparation of samples.

2. A new five-foot length of two-inch diameter aluminum tubing or a split-spoon sampler shall be decontaminated in accordance with Subsection A.2.2 prior to use at each sample location.

3. The aluminum tube or split-spoon sampler shall be forced horizontally into the face of the stockpile as deep as possible and then extracted.

4. The collected soil shall be emptied into a clean stainless steel bowl and homogenized prior to collecting the analytical sample.

5. The sample shall be collected with clean utensils and placed into a prelabeled 250-mL glass jar; then sealed with a teflon lined cap.

6. Where a duplicate sample is required, the duplicate shall be taken concurrently with the analytical sample from the material in the bowl.

7. The disposable latex gloves and used tube, if any, shall be discarded and not reused at the next sample location.

A.3 GROUNDWATER SAMPLING AND TESTING

A.3.1 GENERAL

The groundwater sampling and testing procedures to be implemented at each groundwater sampling location will depend upon the type of well and the available analytical data from previous sampling programs. Wells to be sampled include: the existing on-Site water supply well, the existing Phase I observation wells and Terra's and Superiors' wells. Sample collection details are discussed in Section A.3.5.

A.3.2 ON-SITE WATER SUPPLY WELL

The on-Site water supply well will be sampled and response tested in such a manner as to minimize the quantity of water to be purged and to minimize the potential for any cross-contamination.

The specific procedures involved are as follows:

1. New disposable latex gloves shall be used. Glove changes will be made between purging, sampling and response testing as deemed necessary by the Engineer.

2. Upon removal of the protective cap, measurements of organic vapors in the well casing will be made with an HNU meter.

3. The depth to the static water level shall be measured and recorded using an electronic water level indicator (Solinst or equal). The instrument shall be cleaned prior to each use with a distilled water, methanol, hexane, methanol and distilled water rinse sequence.

4. An inflatable downhole packer and submersible pump shall be used to purge the standing water in the well. Prior to use, the packer, airline, pump and pump discharge line shall be thoroughly cleaned in a detergent wash and flushed under running potable water for five minutes. The packer will then be subjected to the rinse sequence of Item 3 and the pump and pump discharge line will be flushed by running in potable water for five minutes. The submersible pump shall be a water cooled and lubricated design.

5. The packer assembly will then be lowered into the well to the top of the well screen (approximately 114 feet below grade) and inflated.

6. The pump will be inserted into the standing water and the water level measured.

7. The pump will be operated briefly to draw down the water level several feet; then shut off. The water level will be monitored for several minutes to determine if the packer is set correctly.

8. Should the water level rise, the packer will be deflated and reinflated in a higher position in the well.

9. Items 7 and 8 shall be repeated until no water level recovery is evident. The packer depth shall be measured to determine the actual depth to the top of the well screen.

10. The pump shall be lowered to the top of the packer and the standing water pumped out for storage in the clean wastewater tank.

11. Upon removal of the standing volume, the packer shall be slightly deflated to allow the water column to rise to a height above the packer equivalent to the depth below the packer. The packer shall be fully reinflated and the additional standing volume removed before pulling the pump out.

12. Upon removal of the packer, the first well sample shall be collected with a stainless steel bottom-filling bailer. Prior to use, the bailer shall be precleaned with the rinse sequence in Item 3.

13. After sample collection, the well recovery response shall be monitored.

14. The well shall be resampled as per Item 12 after the water level has recovered at least halfway. Additional recovery monitoring shall be conducted if deemed necessary.

15. The total well depth shall be measured prior to resecuring the protective cap.

The first sample shall be submitted for PCB analysis and the second for both PCB and VOC analyses.

A.3.3 EXISTING OBSERVATION WELLS

All on-Site observation wells installed during Phase I will be resampled and analyzed for PCB. In addition, samples collected from well OW4B-86 will be analyzed for CDD and CDF. The following procedures will be used to collect samples from each well.

1. A new par of disposable latex gloves will be used when sampling each well.

2. Upon removal of the protective cap, the air in the well head will be measured for organic vapors with a HNU meter.

3. The depth to the static water level in each well shall be measured to the nearest 0.01 foot using an electronic water level indicator (Solinst or equal). The instrument shall be cleaned prior to each usage with a distilled water, methanol, hexane, methanol and distilled water rinse sequence.

4. Prior to sampling, the well shall be prebailed using a stainless steel bottom filling bailer to remove a minimum of three to five times the standing water volume in the well or until dry. In the event that the well is bailed dry prior to removing three well volumes, the water level will be permitted to recover to a depth sufficient for sample collection; the time the well was bailed dry will be noted and well recovery will be monitored. Upon recovery, the bailer will then be used for sample collection. Prior to use, the bailer will be precleaned with a the rinse sequence in Item 3. Purged groundwater not collected for analysis will be discharged to the ground surface.

A.3.4 TERRA'S AND SUPERIOR'S WELLS

Well water from Terra's and Superior's wells will be resampled and analyzed for PCB. As direct sampling of the wells is not possible, samples will be collected from the nearest tap to the well. The tap will be run for approximately five minutes prior to sample collection to ensure that the collected samples are representative of the well formation water.

A.3.5 SAMPLE DETAILS AND QA/QC

All groundwater samples collected for PCB, CDD and CDF analyses shall not be filtered after collection.

Samples will be collected for analysis as follows:

(a) Priority Pollutant VOCs

Samples for priority pollutant VOC analysis will be collected in two 40-mL amber glass septum vials. The vials will be completely filled and shall be free of air

bubbles. Samples will be immediately placed in coolers and ice for shipment to the laboratory.

(b) PCB

Samples for PCB analysis will be collected in one-litre amber glass bottles, with no preservative added.

(c) Dioxin and Dibenzofuran

Samples for CDD and CDF analyses will be collected in one-litre amber glass bottles.

Blind duplicates and matrix spike samples will be collected as required. Matrix spike samples will be collected at twice the normal volume outlined for the parameters above.

A bailer rinse water sample will be collected at a minimum frequency of one per sample round. The rinse water sample will consist of distilled water poured into, and then sampled out of, a bailer cleaned using the prescribed rinse sequence. This will provide a QA/QC check on the field decontamination procedures used for the bailers between wells.

A.4 TANK LIQUID SAMPLING

Each tank liquid sample shall be composited from two liquid grab samples. Grab samples taken from just below the liquid surface and from near the tank bottom shall be composited in a clean glass bottle in equal proportions. A portion of the composite shall be transferred to a 1-liter amber glass bottle for analyses for total PCB and BNAs. No preservative shall be added.

Grab samples shall be taken using a clean glass-stoppered bottle. The bottle shall be lowered into position and the glass stopper removed for collection of the liquid from the appropriate depth. All tools and equipment used for lowering the bottle shall be decontaminated between use for different grab samples. An unused clean sampling bottle shall be used for each grab sample.

A.5 SURFACE WIPE SAMPLING

Surface wipe sampling is required to determine the acceptability of decontaminated articles and debris for off-Site disposal. Wipe samples shall be collected using 3-inch by 3-inch soxhlet extracted cotton gauze pads as follows:

1. An area of 0.25 square meter, if available, will be marked using a template or an appropriate measuring device.

2. The wipe samples will then be obtained by wiping the area with the cotton pad first in one direction and then in a second direction perpendicular to the first. Each individual cotton gauze pad will be moistened with 8 mL of pesticide grade hexane prior to wiping and wiping will be done so that no free hexane is left on the surface.

3. The cotton gauze pads will then be placed in properly labeled sample jars equipped with a teflon lined lid and submitted for PCB analysis.

A.6 SAMPLE HANDLING

Each sample jar or bottle shall be prelabeled, immediately before the samples are collected, with the following information:

1. project name - 1916 - Conestoga-Rovers & Associates
2. project location - Crawfordsville, Indiana
3. sample identification number;
4. date; and
5. the sampler's name.

The label will be sealed in clear plastic tape to ensure it does not peel off or become damaged.

Following collection of the sample, each sample container shall be enclosed in a polyethylene zip-lock bag and sealed. Each sample to be transported to the analytical laboratory will be logged on the Sample Chain of Custody Form. Samples will be stored in a cooler and packed with appropriate material to cushion the samples during shipment. The cooler shall be sealed with fibreglass strapping tape and a security seal shall be placed on the cooler prior to shipping.

A.7 WASTE MATERIAL HANDLING

All wash water, rinse water, and decontamination fluids generated during the sampling program shall be collected and placed in approved liquid drums for future disposal.

All potentially contaminated articles generated during the sampling program such as used coveralls, gloves, and discarded ground sheets, shall be secured in plastic bags and placed in either an on-Site lugger box or in approved drums. Visibly stained or soiled materials and materials used in contact with contaminated material shall be placed in approved drums. Clean materials shall be placed in the on-Site lugger box.

A.8 ANALYTICAL PROTOCOLS

A.8.1 GENERAL

Samples may contain hazardous constituents, therefore, samples shall be handled at all times with the utmost care to reduce any threat to the public or the environment.

Analytical work shall be performed by a qualified laboratory or laboratories approved by the USEPA.

A.8.2 SAMPLE DELIVERY

Samples shall be delivered to the analytical laboratory by commercial courier under approved chain of custody procedures. Laboratory personnel must complete the chain of custody form upon receipt of the samples in accordance with Section A.8.6.

A.8.3 ANALYTICAL PROTOCOLS

Analytical protocols for determining specific parameters shall be as outlined on Table A-1.

TABLE A-1

ANALYTICAL METHODS SUMMARY[d]

Sample	Parameter	Method for Extraction/Cleanup	Method for Analyses
Soil/Sediment	Total PCB	3540/3550[a]	8080[a]
Groundwater and Tank Liquids	Total PCB	3510/3520[a]	8080[a]
	CDD/CDF	8280[b]	8280[b]
	Priority Pollutant VOC	5010/5020/5030[a]	8240[a]
Tank Liquids	Priority Pollutant BNA	3510/3520[a]	8270[a]
Surface Wipes	Total PCB	(c)	(c)

Notes:

(a) Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, Second Edition, SW-846, United States Environmental Protection Agency, 1984.

(b) Method 8280, Method of Analysis for Chlorinated Dibenzo-p-dioxins and Dibenzofurans, 40 CFR Part 261 Appendix X.

(c) National Institute for Occupation Safety and Health. "Final Test Plan - Sampling and Analysis of Surfaces and Air for Polychlorinated Biphenyls, Dibenzofurans and Benzodioxins: - Annex Building - New Mexico State Highway Department - 1120 Cerrillos Road - Sante Fe, New Mexico". September 16-21, 1985.

(d) Reporting of analytical results shall be in accordance with CLP protocols for confirmatory samples and SW-846 protocols for investigative samples.

A.8.4 QUALITY ASSURANCE/QUALITY CONTROL

Laboratory QA/QC required by the methods specified in Section A.8.3 shall be strictly followed. Field blanks and duplicate samples shall be collected during sampling; ten percent of the samples collected shall be field blanks and ten percent shall be duplicates. Matrix spike samples will be collected at a minimum frequency of one per twenty investigative samples.

A.8.5 SAMPLE CONTAINER PREPARATION

.1 Containers

Sample containers shall be supplied by the analytical laboratory for the collection of all samples. All sample containers will be precleaned by the laboratory and stored at the Site in an area and in a manner to prevent breakage and contamination of the clean containers.

.2 Cleaning Protocol

All sample containers to be used for collection of samples for chemical analysis will be

pre-cleaned and sealed by the laboratory prior to shipment to the Site.

A.8.6 CHAIN OF CUSTODY PROCEDURES

.1 Laboratory Custody Procedures

The laboratory will designate a "sample custodian" and an alternate to act in his/her absence. In addition, the laboratory shall set aside as a "sample storage security area" an isolated room which should be secured and have limited access.

The custodian will receive the incoming samples and indicate receipt by signing the Sample Chain of Custody Form accompanying the samples and retain the sheet as a permanent record. The custodian should check to ensure that the sample numbers indicated on the Sample Chain of Custody Form correspond with the sample container identification numbers. All incoming samples shall be entered into a laboratory sample logbook.

Immediately upon receipt, the custodian shall place samples in the sample room which shall be secured at all times except when samples are removed or replaced by the custodian.

The custodian shall maintain the integrity of the samples by appropriate storage and shall distribute samples to the personnel who are to perform tests.

The analyst must record information in his/her laboratory notebook or analytical work sheet, that describes the samples, the procedures performed and the results of the tests. The notes must be retained as a permanent record in the laboratory and should include any abnormalities which occurred during the testing procedure.

Standard methods of laboratory analysis must be used as described in Section A.8.3.

Laboratory personnel are responsible for the care and custody of a sample once it is handed over to them and shall be prepared to testify that the sample was in their possession and viewed or secured in the laboratory at all times from the moment it was received from the custodian until the tests were run.

Once the sample testing is complete, the unused portion of the sample together with all identifying tags, laboratory records, and other documentation of work must be returned to the custodian for filing in a secured file location.

.2 Sample Chain of Custody Form

The Sample Chain of Custody Form will be introduced into the analytical chain at the time of sample collection. The Sample Chain of Custody Form shall be completed for each sample collected and shall accompany the sample until it is ultimately disposed of. Figure A-2 presents an example of the Sample Chain of Custody Form.

The use of the custody form shall be as follows:

1. The Site Sampler shall fill in all required information from the sample labels upon collection of samples.

2. The original custody form shall be sealed in plastic and placed within the shipping container.

3. The shipping container shall be sealed with a numbered security seal.

4. Custody shall be transferred to the analytical laboratory which will check the integrity of the security seal upon receipt and retrieve the custody form from the shipping container.

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name):

CHAIN OF CUSTODY RECORD

PROJECT Nº:

PROJECT NAME:

SAMPLER'S SIGNATURE _____ (SIGN)

SEQ. Nº.	SAMPLE Nº.	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
				TOTAL NUMBER OF CONTAINERS			

ANTICIPATED CHEMICAL HAZARDS:

RELINQUISHED BY: 1 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 2 _____ (SIGN)
RELINQUISHED BY: 2 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 3 _____ (SIGN)
RELINQUISHED BY: 3 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 4 _____ (SIGN)
RELINQUISHED BY: 4 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 5 _____ (SIGN)
RELINQUISHED BY: 5 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 6 _____ (SIGN)
RELINQUISHED BY: 6 _____ (SIGN)	DATE/TIME _____ | _____	RECEIVED BY: 7 _____ (SIGN)

METHOD OF SHIPMENT:	SHIPPED BY:	RECEIVED FOR LABORATORY BY: (SIGN) _____	DATE/TIME _____ | _____
CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:		COOLER OPENED BY: (SIGN) _____	DATE/TIME _____ | _____

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDEN ROD – SHIPPERS

figure A–2

SAMPLE CHAIN OF CUSTODY FORM
FORMER P.R. MALLORY PLANT SITE
Crawfordsville, Indiana

1916–06/11/87–17–D–0

5. Sample disposal shall be done by the laboratory. Upon disposal, the laboratory shall sign the next open "Relinquished by" box, and words "Disposed" shall be written in the "Received by" box.

APPENDIX B

HEALTH, SAFETY AND SITE CONTROL PLAN

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B.1 GENERAL

Construction and sampling activities at the Site will involve contact with potentially contaminated soils. All on-Site personnel shall comply with the health and safety requirements presented herein. This Health, Safety and Site Control Plan provides for a safe and minimal risk working environment for on-Site personnel. It also provides for emergency response procedures to minimize the potential for adverse impact of construction activities on the general public and Site control measures to mitigate the potential for migration of contaminants.

B.2 BASIS

The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) provide the basis for the safety and health program. Additional specifications within this Section are in addition to OSHA regulations and reflect the positions of both the EPA and the National Institute for Occupational Safety and Health (NIOSH) regarding procedures required to insure safe operations at hazardous waste sites.

The safety and health of the public and on-Site personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work. The Engineer and the on-Site Safety Officer shall be responsible for decisions regarding when work will be stopped or started for health and safety considerations.

B.3 HEALTH AND SAFETY PERSONNEL

A Site Safety Officer who will, as a minimum, be an Industrial Hygiene Technician with qualifications in occupational health, shall be on Site during all major construction activities involving excavation or securement of contaminated material. The Site Safety Officer will report directly to a Certified Industrial Hygienist who shall be responsible for implementing and overviewing the Health and Safety Plan on a part-time basis.

The Certified Industrial Hygienist shall:

a) Be responsible for implementation of the Health and Safety Plan at the start-up of potentially hazardous work;

b) Be responsible for a pre-construction indoctrination of all on-Site personnel with regard to the safety plan and other safety requirements to be observed during construction, including:
   i) potential hazards,
   ii) personal hygiene principles,
   iii) personnel protective equipment,
   iv) respiratory protection equipment usage and fit testing, and
   v) emergency procedures dealing with fire and medical situations;

c) Oversee the Site Safety Officer's activities on a part-time basis and be available on an as-needed basis for emergency situations.

The Safety Officer shall:

a) Be responsible for daily enforcement and monitoring of the Health and Safety Plan;

b) Be responsible for assisting the Certified Industrial Hygienist in the pre-construction indoctrination of all on-Site personnel;

c) Be responsible for notifying the Engineer prior to initiation of any hazardous work;

d) Be responsible for the maintenance of separation of "Exclusion" (potentially contaminated) and "Clean" (uncontaminated) areas as described hereafter; and

e) Be responsible for maintenance of the emergency contingency plan.

B.4 MEDICAL SURVEILLANCE

Medical surveillance shall be subject to an employee's expected interval of time spent on Site.

In accordance with 29 CFR 1910.120, if an employee wears a respirator on a routine basis or as part of routine activities for any part of 30 days during a year, then medical surveillance shall be provided to the minimum requirements specified by the examining physician.

If personnel will not be involved in Site activities as outlined above, medical surveillance shall include testing required for approval for use of a respirator in accordance with 29 CFR 1910.134 as a minimum.

The Contractor shall retain the services of a licensed physician or physician's group to provide the medical examinations and surveillance required. All pertinent Site characterization data, a copy of 29 CFR 1910.120, and a description of the intended personnel protective equipment shall be provided to the physician prior to completing medical surveillance. The name of the physician and evidence of examination of all on-Site personnel shall be provided to the Engineer prior to assigning personnel on-Site work activities involving contact with potentially contaminated materials. Contractor personnel medical approvals shall be maintained by the

Contractor at the Contractor's Site office for the duration of the project.

Medical surveillance protocols shall be the physician's responsibility but shall, as a minimum, meet the requirements of OSHA Standard 29 CFR 1910.120 and 29 CFR 1910.134 for all personnel. This exam may include:

i) medical/occupation questionnaire with work history;

ii) full physical examination;

iii) screening audiometric test with otoscopic exam for wax;

iv) visual acuity measurement, including color perception;

v) pulmonary function test (Spirometry - FVC and FEV-1.0 second);

vi) resting EKG;

vii) chest X-ray (PA) read by Board Certified Radiologist (only when clinically indicated by other testing procedures);

viii) blood chemistry profile*;

ix) complete blood count with differential and platelet evaluation, including WBC, RBC, HGB, Hematocrit; and

x) urinalysis with microscopic examination.

---

* Minimum Blood Chemistry Profile: Calcium, Phosphorous, Glucose, Blood Urea Nitrogen (BUN), Uric Acid, Cholesterol, Total Protein, Total Bilirubin, Direct Bilirubin, Alkaline Phosphatase, SGOT, SGPT, Sodium, Potassium, Chloride, Creatinine, Triglycerides, Albumin, Globulin, A/G Ratio, Lactic Acid Dehydrogenase (LDH) Serum Iron.

All on-Site personnel requiring full medical surveillance shall be provided with medical surveillance within a reasonable time period prior to entering the Site, and at any time there is suspected to be excessive exposure to toxic chemicals or physical agents.

The Contractor shall maintain all medical surveillance records for a minimum period of thirty (30) years and shall make those records available to personnel or governmental agencies as specified in 29 CFR 1910.20 and 29 CFR 1913.10.

B.5 TRAINING

All personnel assigned to or entering the Site shall complete training or refresher sessions. Training and refresher sessions shall ensure that all personnel are capable of and familiar with the use of safety, health, respiratory and protective equipment and with the safety and security procedures required for this Site. The training session shall be completed by the Safety Officer or other qualified professional in the presence of the Certified Industrial Hygienist.

In accordance with 29 CFR 1910.120, all employees exposed to hazardous substances, health hazards or safety hazards shall receive training including a minimum of 40 hours instruction off Site and three days of actual field experience under direct supervision. The Contractor shall provide documentation stating that all on-Site personnel have complied with this regulation. Each individual's name shall be included on this confirmatory letter. The training program shall include the following items:

i) names and personnel responsible for Site health and safety;

ii) Site specific potential hazards;

iii) use of personal protective equipment (PPE), including proper donning and doffing procedures;

iv) work practices by which the employee can minimize risks from these potential hazards;

v) safe use of engineering controls and on-Site equipment;

vi) discussion and completion of medical surveillance requirements and recognition of symptoms associated with exposure to hazards;

vii) Site control methods;

viii) on and off-Site contingency plans;

ix) decontamination procedures;

x) Site specific standard operating procedures;

xi) delineation between work zones;

xii) use of the buddy system;

xiii) scope of the intended Works for the project; and

xiv) review on-Site communications and appropriate hand signals between personnel working in the Exclusion and/or Contaminant Reduction Zone.

The Safety Officer shall be responsible for ensuring that personnel not successfully completing the required training are not permitted to enter the Site to perform work.

The Contractor shall implement a hazard communication ("Right-to-Know") program in accordance with 29 CFR 1910.1200.

Exceptions to the above may only be made by the Engineer for authorized visitors.

B.6 RESPIRATOR PROGRAM

All on-Site personnel shall receive training in the usage of, and be fit tested for, both half and full face respirators. This may include canister/cartridge and supplied air types, as appropriate.

Personnel working on Site shall be required to wear respiratory protection as determined by air monitoring and as instructed by the Safety Officer. As a minimum, all personnel shall wear full face-piece air purifying respirators when working in the Exclusion Zone.

B.7 WORK AREAS/SITE CONTROL

Specific work areas shall be delineated by fence or a flagged line as outlined below:

a) Exclusion Zone (EZ) - This zone shall include all areas where potentially contaminated soils or materials are to be excavated, handled, spoiled or covered, and all areas where contaminated equipment or personnel travel.

For Site control purposes, the Exclusion Zone shall be divided into a Working Exclusion Zone (WEZ) and a Restricted Access Exclusion Zone (RAEZ). Entry of personnel and equipment into the RAEZ for investigative or ravine work shall only be permitted under the direction and supervision of the Engineer.

The EZ shall be clearly delineated in the field prior to commencing Site work, by temporary fencing with warning signs spaced around the perimeter of the Zone warning of a hazardous work area.

b) Contaminant Reduction Zone (CRZ) - This zone will occur at the interface of the EZ and Clean Support Zone and shall provide access for the transfer of construction materials and Site dedicated equipment to the EZ, the decontamination of transport vehicles handling contaminated soil prior to leaving the EZ, the decontamination of personnel and clothing prior to entering the Clean Zone and for the physical segregation of the Clean Zone and EZ.

c) Clean Zone (CZ) - This area is the portion of the Site defined as being the area outside the zone of significant air, soil or surface water contamination. The Clean Zone shall be clearly delineated and procedures implemented to prevent active or passive migration of contamination from the work Site. The function of the Clean Zone includes:

i) An entry area for personnel, material and equipment to the Exclusion Zone;
ii) An exit area for decontaminated personnel, materials and equipment from the Exclusion Zone;
iii) The housing of site special services; and
iv) A storage area for clean safety and work equipment.

d) Temporary Clean Zone - This is a temporary zone designated specifically for the construction phase of the interim storage cell and tank containment pad. Upon completion of cell construction and prior to initiation of construction activities, these zones shall become part of the EZ or CRZ, as appropriate.

Plan 4 illustrates the various work areas and the permitted directions of travel to maintain proper Site control.

B.8 COMMUNICATIONS

Telephone service shall be provided to the Site during major construction activities. Emergency numbers including police, fire, ambulance, hospital, and appropriate Regulatory agencies shall be prominently posted near each phone.

B.9 EMERGENCY AND FIRST AID EQUIPMENT AND SUPPLY

The safety equipment listed below shall be located and maintained within the Exclusion Zone in appropriate locations as directed by the Safety Officer.

a) portable emergency eye wash and shower
b) three twenty pound ABC type dry chemical fire extinguishers
c) two self contained air full face respirators

One hand-held emergency siren and two complete sets of Level B protective equipment shall be located and maintained in the Clean Zone.

B.10 EMERGENCY CONTINGENCY AND RESPONSE PLAN

B.10.1 OFF-SITE CONTINGENCY PLAN

Prior to commencing work involving the excavation, handling and disposal of potentially contaminated material, Duracell will coordinate the development of an off-Site emergency contingency plan. This plan is intended to provide immediate response to a serious site occurrence such as explosion, fire or migration of significant quantities of toxic or hazardous material from the site into adjacent public areas.

Coordination meetings shall be held with appropriate authorities which may include State, Engineer, Fire Department, Hospital, State and City Police, State Department of Transportation, Montgomery County Health Department and Civil Defense officials. The meetings shall identify the Emergency response coordinator through whom all information and coordination will occur in the event of an incident. Plans shall be developed, or existing plans incorporated into the master plan, for

i) evacuation of adjacent areas,
ii) fire fighting procedures,
iii) transport of injured personnel to medical facilities,
iv) priority transportation routes, and

v) coordination and/or modification of highway operations.

An emergency medical facility for non-chemical and chemical accidents shall be designated prior to commencing any work on Site.

Techniques and recommended procedures for immediate first aid emergency response will be developed with local medical facilities.

B.10.2 ON-SITE CONTINGENCY PLAN

a) In the event of injury to on-Site personnel or contact with hazardous materials, the following protocol shall be followed:

i) in the event of injury, notify the Safety Officer, and the Engineer,

ii) contact the closest medical center and describe the injury (closest medical center shall be established prior to commencing any work on site),

iii) decontaminate personnel and administer appropriate emergency first aid, and

iv) transport personnel to the defined medical facility along a predefined route.

b) Fire extinguishers shall be maintained in strategic locations within the Site to combat localized fires. Personnel shall be trained in fire fighting procedures and shall be equipped with self contained air when involved in such operations.

c) In the event of significant release of toxic or hazardous vapors from any container or excavation, the source of such vapors shall be immediately backfilled or covered with fill. Equipment operators shall utilize self contained air respirators during such operations. Alternate plans of contaminant removal will be developed and submitted to the Engineer prior to recommencing work in the area.

B.11 PERSONAL SAFETY AND RELATED EQUIPMENT

All on-Site personnel shall be equipped with personal safety equipment and protective clothing appropriate for the hazardous material being handled and the nature of work being completed. All safety equipment and protective clothing shall be kept clean and well-maintained.

Safety equipment and apparel as required for general work and excavation work within the Exclusion Zone shall consist of:

a) Liquid resistant, splash resistant, full coverage, disposable outerwear including tyvek type coveralls and nitrile/butyl gloves,

b) Hardhats,

c) Safety shoes or boots,

d) Rubber overshoes or overboots,

e) Full face-piece respirators with dual vapor, and particulate filters; self-contained breathing apparatus or other supplied air system as necessary to conduct remedial action in a safe manner.

In addition to the above-noted safety equipment, all personnel directly handling capacitors, if necessary, shall be equipped with viton gloves and upgrade to a supplied air system.

Additional protective equipment usage guidelines to be implemented include:

a) All prescription eyeglasses in use on the Site will be safety glasses. Contact lenses shall not be permitted.

b) All disposable or reusable gloves worn on the Site shall be nitrile/butyl gloves with latex surgical gloves worn underneath.

c) During periods of respirator usage in contaminated areas, respirator filters shall be changed daily or upon breakthrough, whichever occurs first.

d) Footwear used on site will be work shoes or boots, and will be covered by rubber overshoes when entering or working in the Exclusion Zone or Contaminant Reduction Zone.

e) On-Site personnel unable to pass a respirator fit test shall not enter or work in the Exclusion Zone or Contaminant Reduction Zone.

f) All on-Site personnel shall wear an approved hardhat when present in the Exclusion Zone.

g) All personal protective equipment worn on Site shall be decontaminated at the end of each work day. The Safety Officer shall be responsible for ensuring individuals decontaminate personal protective equipment before reuse.

h) Duct tape shall be used to ensure that disposable coveralls and gloves are tightly secured when personnel are working within contaminated zones.

i) Personnel working in the Temporary Clean Zones shall be equipped with Tyvek coveralls, rubber overboots and nitrile/butyl gloves.

B.12 RESPIRATORY PROTECTION

Respiratory protection, as appropriate for all on-Site personnel, shall be mandatory during all on-Site construction activities. As a minimum, all on-Site personnel shall be required to wear full face-piece air purifying respiratory protection when working in the Exclusion Zone.

Levels of respiratory protection have been chosen consistent with potential airborne hazards. The selection of appropriate protection is based upon the potential presence of compounds with the lowest recommended threshold limit value.

In the absence of additional air monitoring information, the following levels of respiratory protection shall be required when working in the Exclusion Zone:

Total Organic Vapor Concentration (ppm)	Level of Respiratory Protection Required
0 - 50	Full face air purifying protection
greater than 50	Supplied air system or suspend activities

All major equipment, handling potentially contaminated soils, shall be equipped with a source of compressed air for air supplied respirators, should they be required.

The Safety Officer shall be responsible for implementing, maintaining and enforcing the respirator program.

On-Site personnel unable to pass a respirator fit test will not be permitted to enter or work in the Exclusion Zone or Contaminant Reduction Zone.

B.13 PERSONAL HYGIENE

The Safety Officer shall be responsible for, and ensure that all personnel performing or supervising remedial work within a hazardous work area, or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids, observe and adhere to the personal hygiene-related provisions of this section.

On-Site personnel found to be disregarding the personal hygiene-related provisions of this plan will be barred from the Site.

The following equipment/facilities shall be provided for the personal hygiene of all on-Site personnel:

a) Suitable disposable outerwear, gloves, and footwear on a daily or as-needed basis for the use of on-Site personnel,

b) Contained storage and disposal for used disposable outerwear,

c) Personnel hygiene facilities complete with change area, showers, toilets and washbasins with contained storage for all wash waters,

d) Lunch area, and

e) A smoking area.

The following regulations for personnel working within the Exclusion Zone will also be enforced:

a) On-Site personnel shall wear disposable outerwear and gloves at all times whenever entering or working in the Exclusion Zone, Contaminant Reduction Zone or temporary Clean Zone.

b) Used disposable outerwear shall not be reused, and when removed, will be placed inside disposable containers provided for that purpose.

c) Smoking shall be prohibited except in a designated smoking area.

d) Eating and drinking shall be prohibited except in the designated lunch or break area.

e) Soiled disposable outerwear shall be removed prior to entering the lunch area, and prior to cleansing hands.

f) On-Site personnel shall thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

g) All personnel involved in excavation and/or handling of potentially contaminated soils in the Exclusion Zone or Contaminant Reduction Zone shall shower and change to street clothes prior to leaving the Site.

B.14 AIR MONITORING

B.14.1 PROTOCOLS

During the progress of active remedial work, air quality shall be monitored in and around each active work location. Sampling shall be conducted on a regular periodic basis, and additionally as required by special or work-related conditions. Air leaving the active work locations shall be monitored by downwind air sampling. Air sampling shall be conducted for particulates (Total Suspended Particulates; Total PCB) and VOC vapors. Any departures from general background shall be reported to the Engineer who will, in conjunction with the Safety Officer, determine when operations should be shut down and restarted.

Instruments required for air monitoring shall include an organic vapor photoinizer or organic vapor analyzer, explosimeter, personal dust monitors, and a continuous total organic vapor monitor alarm.

Contractor air monitoring equipment shall be operated by personnel trained in the use of the specific equipment provided and shall be under the control of the Safety Officer. All monitoring equipment used within the Exclusion zone shall be intrinsically safe.

Should the organic vapor level in any active working location exceed 100 ppm for any single reading, or 50 ppm for any two successive readings, or should the explosimeter indicate in excess of 20 percent of the lower explosive limit on any single reading, then that work location shall be shut down and evacuated upwind. Work shall not resume at such a work location until authorized by the Engineer and Safety Officer.

Personal dust monitors shall be located upwind and downwind of activities involving the handling of contaminated material and on the highest risk person at both the interim storage cell and the contaminated soil excavation areas. Samples collected shall be analyzed on a daily basis for total suspended particulates (TSP). Results of the TSP analysis shall be verbally given to the Engineer within 24 hours of sample collection. Samples which show an excursion over 150 ug/m^3 shall be analyzed for total PCB.

The Contractor shall be responsible for appropriate respiratory protection during all work activities. As a minimum, the Contractor shall ensure that all personnel working within or adjacent to an active work location are supplied with and use full face-piece respiratory protection as required.

A wind direction indicator shall be installed by the Contractor at each active work location.

B.14.2 REPORTING

The results of air monitoring programs shall be reported on specific forms and shall include the following information:

i) Site Location/Date

ii) Work Process/Operation Name

iii) NIOSH Method Used

iv) Air Flow Calibration Record

v) Temperature, Pressure, Humidity at Sample Location

vi) Area Sampling Location Diagram

vii) Personal Samples

- Name of Worker
- Location of Workers

viii) Area Sample Description/Location

ix) Sampling Data

- Pump I.D.
- Flow Rate
- Sample Filter/Tube Number
- Pump On/Off (time)
- Volume Air Collected (liters)
- Lab Sample Number

x) Analysis Results (mg/m^3, ppm)

xi) Field Notes

- Description of Operations and Complaints/Symptoms
- Chemicals/Materials/Equipment in Use
- Engineering/Administration Controls in Effect
- Personal Protective Equipment in Use
- Sampling Observations/Comments

xii) Sample Submission

- Name, Location
- Chemist/Industrial Hygienist Name
- Principal Air Monitor
- Reviewed by

In addition, all daily air monitoring activities shall be recorded in a hard cover log book which will be maintained on Site at all times by the Safety Officer.

B.15 CONTAMINANT MIGRATION CONTROL

To prevent the migration of potentially contaminated material both on Site and off Site, vehicle travel shall be restricted as shown on Plan 4.

All vehicles and equipment used in the Exclusion Zone shall be decontaminated in the Contaminant Reduction Zone prior to leaving the Site and for any work outside of fenced areas. The Engineer will certify that each piece of equipment has been decontaminated prior to removal from the Site.

Decontamination shall involve the thorough cleaning of equipment with a high pressure steam cleaning unit, and shall be performed at the decontamination pad. Decontamination wash waters shall be collected and contained in an on-Site storage tank. Wash waters will be sampled prior to disposal in accordance with State and Federal regulations.

Personnel engaged in vehicle decontamination shall wear protective equipment including disposable clothing and respiratory protection.

B.16 PARTICULATE EMISSION CONTROL

During construction, a dust control program shall be implemented and strictly enforced to minimize the generation and potential off-Site migration of fugitive particulate emissions. Excavations and excavated material shall be kept moist while uncovered due to Site activities. Decontamination wash waters from the decontamination area may be used to keep excavated material moist.

All roadways, designated work areas and other possible sources of dust generation shall be controlled by application of water as required.

B.17 POSTED REGULATIONS

"No Smoking" signs shall be posted at the site entrance and on the perimeter of the Exclusion Zone in addition to signs which state "Warning, Hazardous Work Area, Do Not Enter Unless Authorized". In addition, a notice directing visitors to the office will be posted at the Site entrance.

Safety regulations and safety reminders will be posted at conspicuous locations throughout the Site.

B.18 SAFETY MEETINGS

The Safety Officer will conduct weekly safety meetings which will be mandatory for all Site personnel. The meetings will provide refresher courses for existing equipment and protocols, and will examine new Site conditions as they are encountered.

Additional safety meetings will be held on an as required basis.

Should any unforeseen or Site peculiar safety related factor, hazard, or condition become evident during the performance of work at this Site, it will be brought to the attention of the Engineer in writing as quickly as possible, for resolution. In the interim, prudent action shall be taken to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

B.19 SITE SECURITY

The Site shall be secured on a 24-hour basis when portions of the Site security fence have been dismantled for construction and, additionally, on an as-required basis when vehicles must frequently pass through the access gates. Security may include an unarmed guard as deemed necessary by the Engineer.

As part of the Site security, the Engineer or Safety Officer shall:

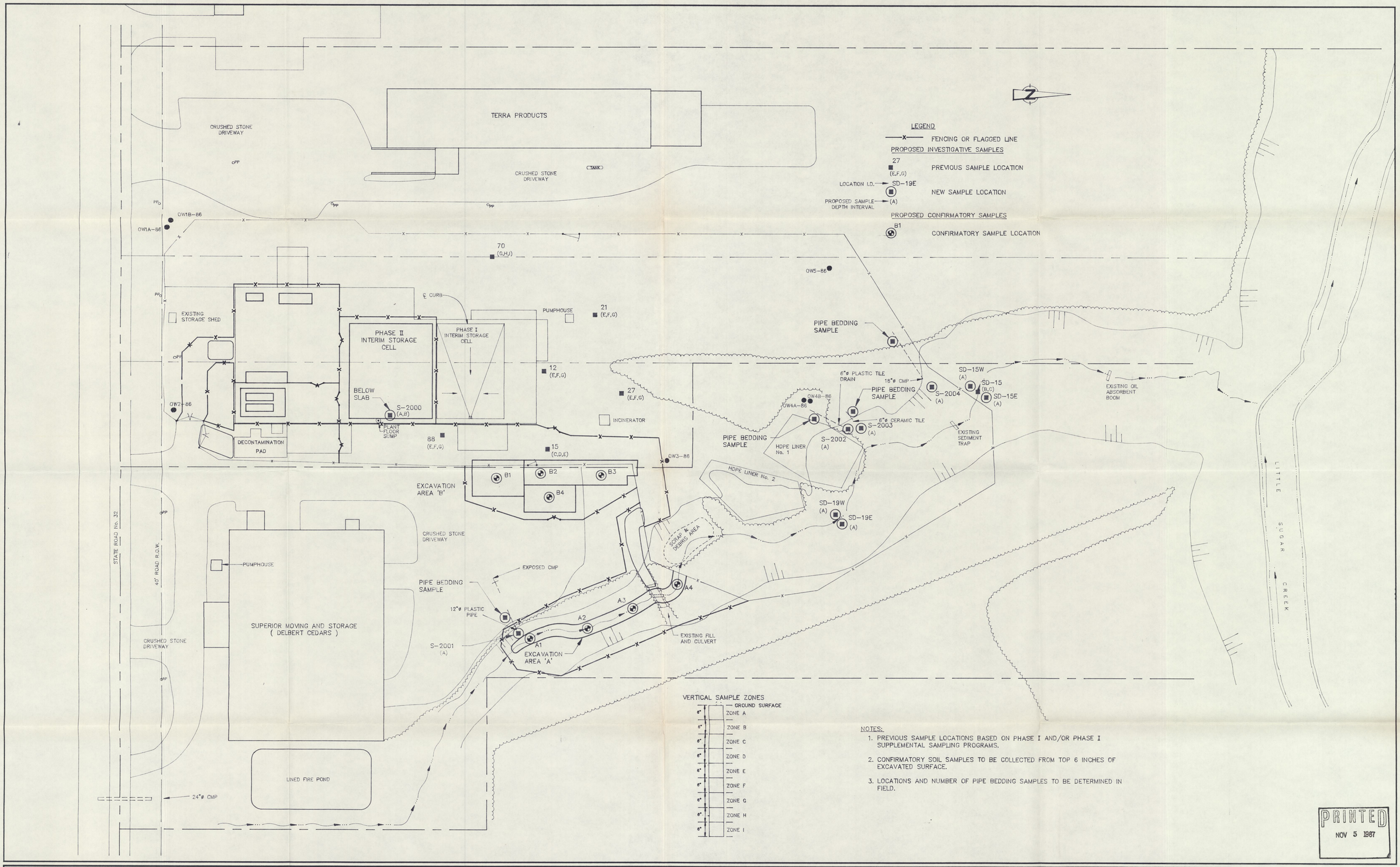
a) Limit vehicular access to the Site to authorized vehicles and personnel only,

b) Maintain a visitors and Site personnel sign-in/sign-out log, and a log of all security incidents, and

c) Provide initial screening of Site visitors.

B.20 ON-SITE METEOROLOGICAL STATION

A continuously operational site meteorological station with live and recorded monitoring of temperatures, wind speed, wind direction and humidity, shall be installed and maintained on Site for the duration of all construction activities.



NOTES:

1. PREVIOUS SAMPLE LOCATIONS BASED ON PHASE I AND/OR PHASE I SUPPLEMENTAL SAMPLING PROGRAMS.
2. CONFIRMATORY SOIL SAMPLES TO BE COLLECTED FROM TOP 6 INCHES OF EXCAVATED SURFACE.
3. LOCATIONS AND NUMBER OF PIPE BEDDING SAMPLES TO BE DETERMINED IN FIELD.

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LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5-86 OBSERVATION WELL
- oPP POWER POLE
- PROPERTY LINE
- SECURITY FENCE
- ACCESS GATE

№	Revision	Date	Initial

Approved

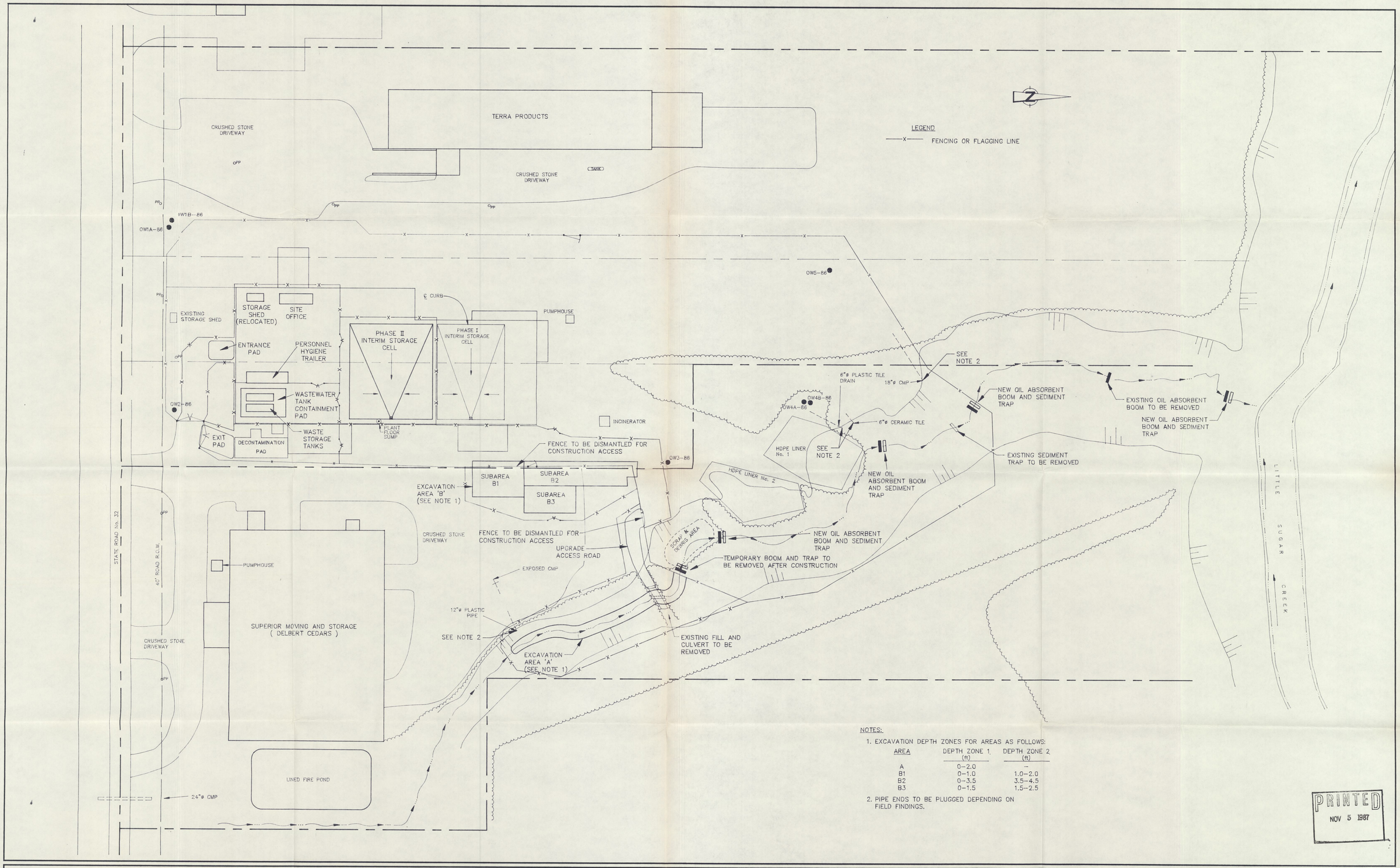
FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

PHASE II RESPONSE ACTION WORK PLAN

PROPOSED SAMPLE LOCATIONS

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

Drawn by: B.T.S.	Scale: 1" = 40'	Date: NOVEMBER 5, 1987	File №: 39	Rev.№:
Designed by: C.P.H.E.	Field book:	Project №: 1916	Drawing №: 21	
Checked by: R.T.P.			PLAN 3	



NOTES:

1. EXCAVATION DEPTH ZONES FOR AREAS AS FOLLOWS:

AREA	DEPTH ZONE 1. (ft)	DEPTH ZONE 2 (ft)
A	0–2.0	–
B1	0–1.0	1.0–2.0
B2	0–3.5	3.5–4.5
B3	0–1.5	1.5–2.5

2. PIPE ENDS TO BE PLUGGED DEPENDING ON FIELD FINDINGS.

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LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5–86 OBSERVATION WELL
- POWER POLE
- PROPERTY LINE
- SECURITY FENCE
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Nº	Revision	Date	Initial

Approved

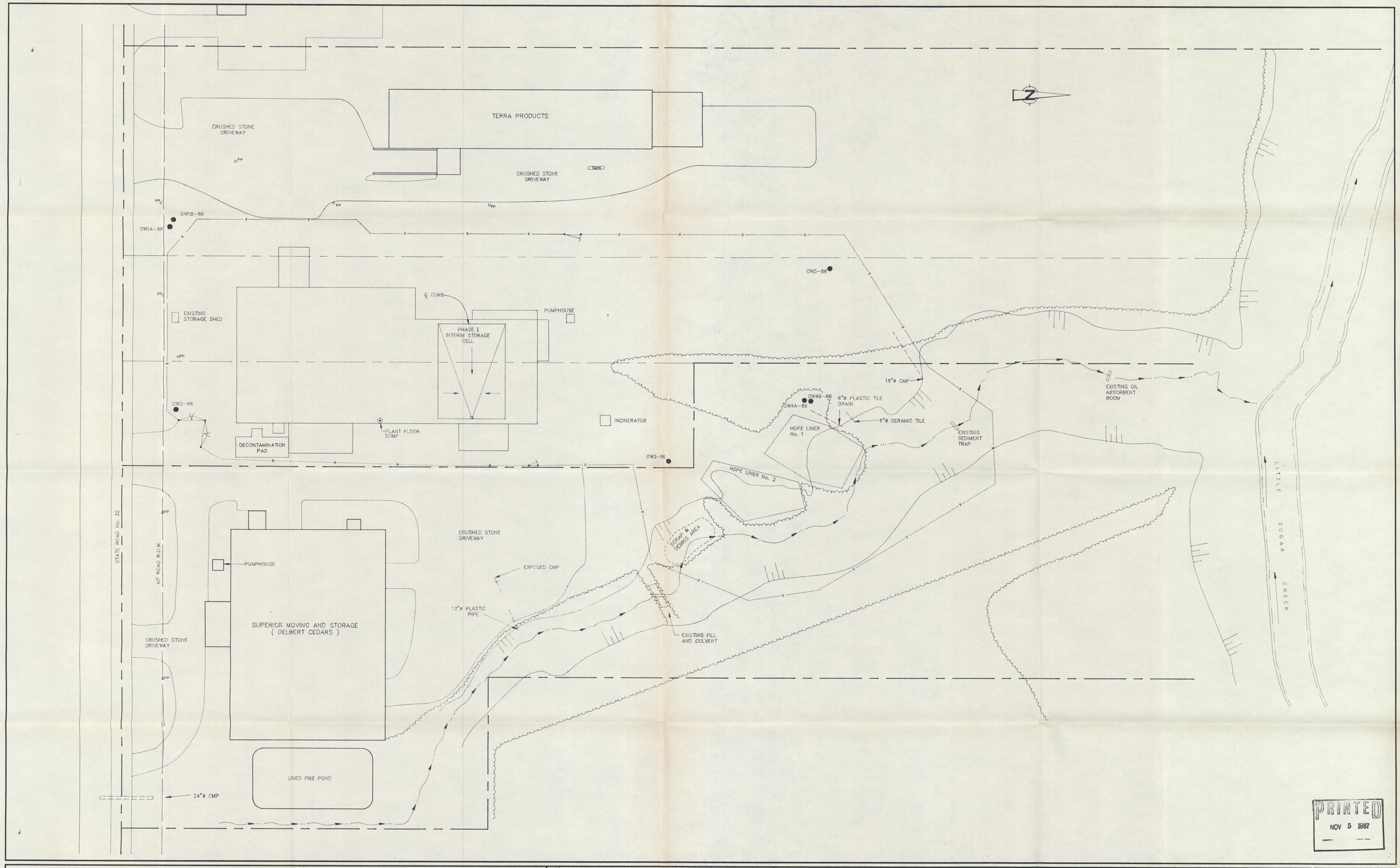
FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

PHASE II RESPONSE ACTION WORK PLAN

PROPOSED REMEDIAL CONSTRUCTION

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

Drawn by: B.T.S.	Scale: 1" = 40'	Date: NOVEMBER 5,1987	File Nº: 39	Rev.Nº:
Designed by: C.P.H.E.				
Checked by: R.T.P.	Field book:	Project Nº: 1916	Drawing Nº: 20 PLAN 2	



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LEGEND

TREE LINE	OW5-86 ● OBSERVATION WELL	ACCESS GATE
TOP OF SLOPE	○PP POWER POLE	
STREAM FLOW	PROPERTY LINE	
CREEK BANK	—x——x— SECURITY FENCE	

Nº	Revision	Date	Initial

Approved

FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

PHASE II RESPONSE ACTION WORK PLAN

EXISTING CONDITIONS

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

Drawn by: WRW	Scale: 1" = 40'	Date: NOVEMBER 5, 1987	File Nº: 39	Rev.Nº:
Designed by: C.P.H.E.	Field book:	Project Nº: 1916	Drawing Nº: 19 PLAN 1	
Checked by: R.T.P.				