

OHIO E.P.A.

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ENTERED DIRECTOR'S JOURNAL

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

Joy Mining Machinery
177 Thorn Hill Road
Warrendale, PA 15086

and

Howden Buffalo Inc.
New Philadelphia Division
338 South Broadway
New Philadelphia, OH 44663

Respondents

For the Site known as:

Joy Mining Machinery
New Philadelphia, OH

Director's Final
Findings and Orders

For Remedial Design and
Remedial Action

I certify this to be a true and accurate copy of the
official documents as filed in the records of the Ohio
Environmental Protection Agency.

By: 

Date: 1.4.2011

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Attachment A - Decision Document

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PREAMBLE

It is agreed to by the Parties hereto as follows:

I. JURISDICTION

1. These Director's Final Findings and Orders ("Orders") are issued to Joy Mining Machinery and Howden Buffalo Inc. ("Respondents"), pursuant to the authority vested in the Director of Ohio EPA under Ohio Revised Code ("ORC") §§ 3734.13, 3734.20, 6111.03, and 3745.01.

II. PARTIES BOUND

2. These Orders shall apply to and be binding upon Respondents and their successors in interest liable under Ohio law.
3. No change in ownership or corporate status of Respondents including, but not limited to, any transfer of assets or real or personal property shall in any way alter Respondents' obligations under these Orders.
4. Respondents shall provide a copy of these Orders to all contractors, subcontractors, laboratories and consultants retained to conduct any portion of the Work performed pursuant to these Orders, within fourteen (14) days of the effective date of these Orders or upon date of retention. Respondents shall ensure that all contractors, subcontractors, laboratories and consultants retained to perform the Work pursuant to these Orders also comply with the applicable provisions of these Orders.

III. DEFINITIONS

5. Unless otherwise expressly provided herein, all terms used in these Orders or in any appendices shall have the same meaning as defined in ORC Chapters 3734 and 6111, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the rules promulgated thereunder. Whenever the terms listed below are used in these Orders or in any appendices, attached hereto and incorporated herein, the following definitions shall apply:
 - a. "CERCLA" means the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq.
 - b. "Contaminant" and "Contamination" means the chemicals listed in Tables 6, 7, and 8 of the Decision Document, which are "hazardous waste" under ORC §

3734.01 (J), "industrial waste" under ORC§ 6111.01(C); and/or "other wastes" under ORC § 6111.01(D).

c. "Day" means a calendar day unless expressly stated to be a business day. "Business day" shall mean a day other than a Saturday, Sunday, or state holiday. In computing any period of time under these Orders, where the last day would fall on a Saturday, Sunday, or state holiday, the period shall run until the close of the next business day.

d. "Decision Document" means the document (including the Decision Summary) attached to these Orders as Attachment A, and any future amendments.

e. "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended.

f. "Ohio EPA" means the Ohio Environmental Protection Agency and its designated representatives.

g. "Orders" means these Director's Final Findings and Orders and all attachments hereto.

h. "Paragraph" means a portion of these Orders identified by an Arabic numeral or an uppercase or lowercase letter.

i. "Parties" means Respondents and the Ohio EPA.

j. "Property" means the industrial facility located at 338 South Broadway, New Philadelphia, Ohio, currently owned and operated by Howden Buffalo Inc. and formerly owned and operated by Joy Technologies Inc. The parcel number is #4306948000.

k. "Respondents" means Howden Buffalo Inc. and Joy Mining Machinery.

l. "Remedial Action" ("RA") means those activities to be undertaken by Respondents to implement and maintain the effectiveness of the final plans and specifications submitted by Respondents pursuant to the Remedial Design and Remedial Action Work Plan.

m. "Remedial Design" ("RD") means those activities to be undertaken by Respondents to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design and Remedial Action Work Plan.

- n. "Remedial Design and Remedial Action Work Plan" ("RD/RA Work Plan") means the document submitted by Respondents and approved by Ohio EPA that details the Remedial Design and Remedial Action activities to be conducted pursuant to these Orders.
- o. "Response Costs" means all costs incurred by Ohio EPA not inconsistent with the NCP including, but not limited to, payroll costs, contractor costs, travel costs, direct costs, indirect costs, legal and enforcement related costs, oversight costs, laboratory costs, and the costs of reviewing or developing plans, reports, and other items pursuant to these Orders, verifying the Work, or otherwise implementing or enforcing these Orders.
- p. "Section" means a portion of these Orders identified by a roman numeral.
- q. "Site" means the industrial facility located at 338 South Broadway in New Philadelphia, Tuscarawas County, Ohio where Contaminants have been treated, stored or disposed, including any other area where such Contaminants have migrated or threaten to migrate.
- r. "Statement of Work" ("SOW") means the "Model Statement of Work for Remedial Design and Remedial Action" for the implementation of the Remedial Design and Remedial Action at the Site, as set forth in Attachment B of these Orders. The SOW is not specific to any Site.
- s. "Supporting Documents" means the field sampling plan ("FSP"), quality assurance project plan ("QAPP") and health and safety plan ("HASp") developed concurrently with the RD/RA Work Plan pursuant to these Orders and Section 4 of the SOW.
- t. "Transferee" means any future owner of any interest in the Site, including but not limited to, owners of an interest in fee simple, mortgagors, easement holders, and lessees.
- u. "Work" means the Remedial Design and Remedial Action that Respondents are required to perform under these Orders.

IV. FINDINGS

6. The Director of Ohio EPA has determined the following findings:

- a. The current Howden Buffalo Inc. and former Joy Mining Machinery Site is located at 338 South Broadway in New Philadelphia, Tuscarawas County, Ohio.

- b. From approximately 1960 to 1997, Joy Technologies Inc., now known as Joy Mining Machinery, owned and operated an industrial fan manufacturing facility at the Property. Howden Buffalo Inc. currently owns and operates an industrial fan manufacturing business at the Site.
- c. From about 1960 through 1975, solvents and hydraulic oil containing polychlorinated biphenols (PCBs) were used at the Site as part of the production of electrical connectors and conveyor system components.
- d. On May 21, 1990, Ohio EPA and Joy Technologies Inc. entered into an administrative consent order for the performance of a Remedial Investigation and Feasibility Study (RI/FS) to investigate the nature and extent of the contamination at the Site. The work agreed to under the RI/FS Order has been completed and the RI/FS Order has been terminated.
- e. Based upon the Feasibility Study Report, Ohio EPA chose its Preferred Alternative to remediate the Site on November 25, 1996. A public meeting was held to discuss the Preferred Alternative on January 13, 1997.
- f. In June 1999, Ohio EPA issued an Invitation to Negotiate (ITN) to the Respondents. The scope of work contained in the ITN was for the development of an RD/RA Work Plan that would provide for the design, construction and implementation of the remedy as set forth in the Decision Document.
- g. In September 1999, Respondents provided the Ohio EPA with data from August and September 1998. This data indicated the detection of volatile organic compounds (VOCs), including tetrachloroethene (PCE), trichloroethene (TCE), and cis 1,2-dichloroethene, in ground water beneath the western edge of the City well field and moving toward the municipal supply wells from a west-northwest direction (this contamination is known as the "western plume"). The "western plume" at that time was attributed to an unidentified source unrelated to the Site.
- h. In February 2000, Ohio EPA issued a Decision Document, which selected the remedy for the Site. The Decision Document is attached hereto as Attachment A, and incorporated by reference herein.
- i. Due to ongoing concerns about the "western plume" during negotiation of RD/RA orders, finalization of a ground water remedy was deferred and RI/FS orders were changed to an Interim Action for soils only. The Interim Action orders were issued on January 29, 2001, and required Respondents to implement the soils remedial alternative set forth in the Decision Document.

j. Ohio EPA investigated and delineated the "western plume" in 2001, and determined that the former Puritan Laundry property, located approximately 2,000 feet west-northwest of the well field, is the source for the "western plume," which contains primarily PCE. Ohio EPA has initiated discussion with the owners of the Puritan property to address the plume and/or source areas on the Puritan site.

k. The soil remedy in the Decision Document called for soil vapor extraction (SVE) in the three areas of greater relative TCE contamination and one area of PCE contamination. Soil sampling and vapor monitoring is to be used to evaluate effectiveness and determine when cleanup levels are attained. Five years was the cleanup time estimated in the Feasibility Study.

l. The ground water remedial alternative set forth in the Decision Document called for operation of city production wells and air strippers to capture and treat the plume until ground water is consistently below the Maximum Contaminant Levels (MCLs) for chemicals of concern. The remedy also called for a legally binding agreement between Joy Mining Machinery and the City of New Philadelphia to ensure that production well pumping rates and air stripper operation would be adequate to implement the remedy. The Decision Document required Joy Mining Machinery to document the extent of the ground water plume on a regular basis through monitoring, and cleanup was estimated in the Feasibility Study to be achieved in 12-14 years.

m. The three SVE systems, which have been operating since March 2002, have removed more than 1,300 pounds of VOCs (primarily TCE) since startup. More than 1,000 pounds of this total were removed within the first year. The rate of removal declined thereafter such that an estimated 30 pound of VOCs were removed during 2009, an estimated 32 pounds of VOCs were removed during 2008, and an estimated 27 pounds were removed during 2007.

n. SVE System A was shut down in September 2005 upon demonstration that the system was no longer removing sufficient quantities of VOCs to be effective. Recent groundwater sampling, however, has shown an increase in the VOC concentrations in the area that System A was remediating.

o. Groundwater wells, both onsite and offsite, have been sampled at a frequency ranging from quarterly to semi-annually during the eight years that the SVE systems have been in operation. Current TCE concentrations range from below detection to 340 ppb.

p. Joy Mining Machinery submitted a "Remedy Performance Review Report" in August 2007 to serve as a five year review for the SVE remedy. Ohio EPA

recommended optimizing the SVE systems in an effort to improve mass removal of VOCs. Joy engaged in activities to optimize the systems during the summer and fall of 2008.

q. Respondents are each a "person" as defined under Section 3734.01(G) of the ORC.

r. The Site is a hazardous waste facility, solid waste facility or other location where hazardous waste was treated, stored or disposed.

s. Because of their quantity, concentration, physical or chemical characteristics, the Director has determined the Chemicals of Concern (COCs) found at the Site are "hazardous wastes" as defined under ORC § 3734.01(J).

t. COCs found at the Site are "industrial wastes" or "other wastes" as defined under ORC § 6111.01(C) and (D).

u. The ground and surface waters at the Site are "waters of the state" as defined in ORC § 6111.01(H).

v. Conditions at the Site may constitute a threat to public health or safety or may be causing or contributing or threatening to cause or contribute to air or water pollution or soil contamination as provided in ORC § 3734.20(B).

w. The migration and threatened migration of Contaminants to ground water, or surface water at or from the Site constitutes a discharge to "waters of the state," as the term is defined in ORC § 6111.01(H). The Work required pursuant to these Orders will contribute to the prohibition or abatement of the discharge of Contaminants to waters of the state.

x. In issuing these Orders, the Director has given consideration to, and based his determination on, evidence relating to both the technical feasibility and economic reasonableness of complying with these Orders, and to evidence relating to conditions calculated to result from compliance with these Orders, and their relation to the benefits to the people of the state to be derived from such compliance.

V. GENERAL PROVISIONS

7. Objective of the Parties

The objective of the Parties in entering into these Orders is to protect public health and safety and the environment from the disposal, discharge, or release of

Contaminants through conducting the remedy by Respondents as set forth in the Decision Document and in accordance with these Orders.

8. Commitment of Respondents

Respondents agree to perform the Work in accordance with these Orders, including but not limited to the SOW, those guidance documents found in the attachment to the SOW and appropriate portions of mutually agreed-upon guidance, and with all standards, specifications, and schedules as approved by Ohio EPA pursuant to these Orders. Respondents also agree to reimburse Ohio EPA for all Response Costs as provided in Section XVII of these Orders and perform all other obligations of these Orders.

9. Compliance With Law

- a. All activities undertaken by Respondents pursuant to these Orders shall be performed in accordance with the requirements of all applicable federal, state and local laws and regulations, and in a manner not inconsistent with the NCP.
- b. Ohio EPA expects that activities conducted pursuant to these Orders, if approved by Ohio EPA, would be considered necessary and consistent with the NCP.
- c. Where any portion of the Work requires a permit, license or other authorization from Ohio EPA or any other state, federal or local government agency, Respondents shall submit applications in a timely manner and take all other actions necessary to obtain such permit, license or other authorization. These Orders are not, and shall not be construed to be, a permit, license or other authorization issued pursuant to any statute or regulation.

VI. PERFORMANCE OF THE WORK BY RESPONDENTS

10. Supervising Contractor

All Work performed pursuant to these Orders shall be under the direction and supervision of a contractor with expertise in hazardous waste site investigation and remediation. Prior to the initiation of the Work, Respondents shall notify Ohio EPA in writing of the name of the supervising contractor and any subcontractor to be used in performing the Work under these Orders.

11. Remedial Design and Remedial Action

- a. RD/RA project initiation meeting. Within fourteen (14) days of the effective date of these Orders, unless otherwise mutually agreed to by the Parties, Respondents shall meet with Ohio EPA to discuss the requirements of the RD/RA Work Plan.
- b. Submission of RD/RA Work Plan. Within sixty (60) days after the RD/RA project initiation meeting described in the preceding paragraph, unless otherwise specified in writing by Ohio EPA, Respondents shall submit to Ohio EPA a RD/RA Work Plan and schedule for implementation of the Work required under this Section of these Orders. The RD/RA Work Plan shall provide for the operation and maintenance of the remedy as set forth in the Decision Document.
- c. Criteria for RD/RA Work Plan development. The RD/RA Work Plan, Supporting Documents, and any other deliverables required under the approved RD/RA Work Plan shall be developed in conformance with the RD/RA SOW contained in Attachment B of these Orders, and the guidance documents listed in Attachment C of these Orders. The RD/RA Work Plan shall include a proposed schedule that includes a completion date for each task. If Ohio EPA determines that any additional or revised guidance documents affect the Work to be performed in implementing the RD/RA, Ohio EPA will notify Respondents in writing, and the RD/RA Work Plan and other affected documents shall be modified accordingly, unless Respondents invoke the Dispute Resolution procedures set forth at Section XV.
- d. Handling any inconsistencies. Should Respondents identify any inconsistency between any of the laws and regulations and guidance documents that Respondents are required to follow by these Orders, Respondents shall notify Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the Work to be performed. Respondents shall also recommend, along with a supportable rationale justifying each recommendation, the requirement that Respondents believe should be followed. Respondents shall implement the affected Work as directed in writing by Ohio EPA unless Respondents invoke the Dispute Resolution procedures at Section XV.
- e. Review of RD/RA Work Plan. Ohio EPA will review the RD/RA Work Plan and Supporting Documents pursuant to the procedures set forth in the Review of Submissions Section of these Orders.
- f. Implementation of the RD/RA Work Plan. Upon Ohio EPA's approval of the RD/RA Work Plan, Respondents shall implement the RD/RA Work Plan as approved. Respondents shall submit all plans, reports, or other deliverables

required under the approved RD/RA Work Plan, in accordance with the approved schedule, for Ohio EPA's review and approval pursuant to the Review of Submissions Section of these Orders.

12. Operation and Maintenance Plan

The O&M Plan, including a schedule for implementation, shall be submitted in accordance with the approved RD/RA Work Plan. Ohio EPA will review the O&M Plan pursuant to the procedures set forth in the Review of Submissions Section of these Orders. Upon approval of the O&M Plan by Ohio EPA, Respondents shall implement the O&M Plan. Respondents shall submit all plans, reports, or other deliverables required under the approved O&M Plan, in accordance with the approved O&M schedule set forth therein, for Ohio EPA's review and approval pursuant to the Review of Submissions Section of these Orders.

VII. ASSURANCE OF ABILITY TO COMPLETE WORK

13. Cost Estimates

- a. Within sixty (60) days after Respondents' receipt of Ohio EPA's approval of the Final Design submittal specified under section 3.3.2.4 of Attachment B of these Orders and required under Section VI (PERFORMANCE OF WORK) of these Orders, Respondents shall submit to Ohio EPA a final detailed written estimate of the cost of conducting, for the period of the next five years following Ohio EPA's approval of the Final Design submittal specified under section 3.3.2.4 of Attachment B of these Orders, the operation and maintenance ("O&M") and monitoring of the selected remedy identified in the Decision Document, in current dollars ("Initial Cost Estimate"), including any adjustments for inflation based upon the Gross Domestic Product Implicit Price Deflator ("GDP/IPD") and any adjustments for discount rates based upon the Federal Reserve Bank's 30-year Treasury Bill rate for the most recent month for which data is available.
- b. Beginning on the second anniversary date of the Respondents' posting of the Initial Cost Estimate, and every two years thereafter, Respondents must submit to Ohio EPA an estimated cost of the remaining O&M and monitoring Work to be performed during the subsequent five year period ("Current Revised Cost Estimate") based upon the procedures described in the preceding paragraph. Information relied upon in support of the Current Revised Cost Estimate must be provided with any request for reduction. If an adjustment is made to any such Current Revised Cost Estimate for inflation and/or discount rates, an explanation shall be provided. The Current Revised Cost Estimate shall operate on a rolling

five year basis, such that each biannual Current Revised Cost Estimate shall estimate the cost of O&M and monitoring work for the next five year period following the date of that Current Revised Cost Estimate (the "Financial Assurance Period").

- c. The Current Revised Cost Estimate shall reflect any adjustments caused by Respondents' agreement to perform any additional O&M and monitoring Work requested by Ohio EPA pursuant to Section IX (ADDITIONAL WORK) or by any other conditions that have increased the cost of the O&M and monitoring Work to be performed under these Orders (e.g., change in contractor).
- d. Respondents shall submit the Initial Cost Estimate and all Current Revised Cost Estimates to Ohio EPA for review and approval, which approval shall not be unreasonably withheld. Ohio EPA will review each cost estimate and notify Respondents in writing of Ohio EPA's approval, disapproval, or combination thereof in accordance with Section XIV (REVIEW OF SUBMISSIONS).

14. Performance Guarantee

- a. To secure the full and final completion of the O&M and monitoring Work in accordance with these Orders, within sixty (60) days following the effective date of these Orders or within sixty (60) days following Ohio EPA's approval of the Initial Cost Estimate, whichever date is later, Respondents shall establish financial security for the benefit of Ohio EPA in an amount at least equal to the Initial Cost Estimate. Thereafter, Respondents shall maintain financial security in an amount at least equal to the Current Revised Cost Estimate ("Financial Assurance") for the Financial Assurance Period associated with that specific Current Revised Cost Estimate. Respondents may use one or more of the Financial Assurance mechanisms described in subparagraphs (i) through (iv) below.

Respondents shall submit draft Financial Assurance instruments and related documents to Ohio EPA, concurrently with Respondents' submission of the Initial Cost Estimate, for Ohio EPA's review and approval in accordance with Section XIV (REVIEW OF SUBMISSIONS).

- i. A trust fund administered by a trustee which is an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency, that is acceptable to Ohio EPA. The trust agreement shall provide that the trustee shall make payments from the fund, (1) as Respondents

shall direct in writing to pay invoices submitted by Respondents from the fund for Work expenditures made by approved contractors engaged by Respondents; Respondents must only direct payment of invoices for which Respondents have submitted a notification to Ohio EPA's Site Coordinator, in accordance with Section XIV (REVIEW OF SUBMISSIONS) of these Orders or (2) in the event of a failure of performance as described in this Section, to pay any other person whom Ohio EPA determines has performed or will perform the Work required by these Orders at the direction of Ohio EPA.

- ii. One or more irrevocable letter(s) of credit, payable at the direction of Ohio EPA, into a standby trust fund that meets the requirements of the trust fund described in subparagraph (i) above. The letter(s) of credit must be issued by one or more financial institution(s) (1) that has the authority to issue letters of credit and (2) whose letter-of-credit operations are regulated and examined by a federal or state agency. The letter(s) of credit must be irrevocable and issued for a period of at least one (1) year. The letter(s) of credit must provide that upon its expiration date, the letter(s) of credit will be automatically extended for a period of at least one (1) year unless, at least one hundred and twenty (120) days before the current expiration date, the issuing institution notifies Respondents and Ohio EPA by certified mail of a decision not to extend the expiration date. Under the terms of the letter(s) of credit, the one hundred and twenty (120) days will begin on the date when Respondents and Ohio EPA have received the notice, as evidenced by the return receipts.
- iii. A policy of insurance that (1) provides Ohio EPA with rights as a beneficiary, which is acceptable to Ohio EPA and (2) is issued by an insurance carrier that has the authority to issue insurance policies in Ohio and whose insurance operations are regulated and examined by a federal or state agency. The insurance policy shall be issued for a face amount at least equal to the Initial Cost Estimate or Current Revised Cost Estimate, whichever is the most current estimate, except for those costs covered by another Financial Assurance instrument, as permitted in subparagraphs (i), (ii) and (iv) herein. The policy shall provide that the insurer shall make payments as Respondents shall direct in writing to (1) reimburse Respondents for expenditures made by Respondents for Work performed in accordance with these Orders or (2) pay any other person whom Ohio EPA determines has performed or will

perform the Work in accordance with these Orders, up to an amount equal to the face amount of the policy. The policy shall also provide that it may not be canceled, terminated or non-renewed and that it shall remain in full force and effect in the event that (1) Respondents are named as debtors in a voluntary or involuntary proceeding under Title 11 (Bankruptcy) of the U.S. Code or (2) Ohio EPA issues a Performance Failure Notice under this Section of these Orders.

- iv. An escrow agreement administered by an escrow agent which is an entity that has the authority to act as an escrow agent and whose escrow banking operations are regulated and examined by a federal or state agency, that is acceptable to Ohio EPA. The escrow account shall be an interest-bearing account in an amount agreed upon by the Parties, and shall be dedicated solely for the payment of costs associated with the long-term O&M and monitoring work at the Site. The escrow agreement shall provide that the escrow agent make payments from the escrow account at a rate of one dollar (\$1.00) per one dollar (\$1.00) spent, (1) as Respondents shall direct in writing to pay invoices submitted by Respondents from the escrow account for Work expenditures made by approved contractors engaged by Respondents; Respondents must only direct payment of invoices for which Respondents have submitted a notification to Ohio EPA's Site Coordinator, in accordance with Section XIV (REVIEW OF SUBMISSIONS) of these Orders or (2) in the event of a failure of performance as described in this Section, to pay any other person whom Ohio EPA determines has performed or will perform the Work required by these Orders at the direction of Ohio EPA.
- b. Within thirty (30) days of notification of Ohio EPA's approval, the executed Financial Assurance instrument(s) provided pursuant to this Section (including, without limitation, the original versions of letters of credit and other negotiable instruments issued for Ohio EPA's benefit) shall be submitted by Respondents to the Ohio EPA Site Coordinator in accordance with Section XIV (REVIEW OF SUBMISSIONS) of these Orders. Respondents may choose from and freely substitute among the foregoing Financial Assurance mechanisms during any Financial Assurance Period, provided they maintain Financial Assurance for the Current Revised Cost Estimate for that Financial Assurance Period. Either Respondent may secure and maintain the Financial Assurance required of the Respondents under these Orders, but each Respondent is not required to obtain independent Financial Assurance.

- c. Whenever the Current Revised Cost Estimate for a Financial Assurance Period exceeds the amount of Financial Assurance already provided pursuant to this Section by more than fifteen percent (15%), Respondents shall, within sixty (60) days after submitting the Current Revised Cost Estimate for that Financial Assurance Period, obtain and present to Ohio EPA, for review and approval a revised form of Financial Assurance (and otherwise acceptable under this Section) that reflects such cost increase in accordance with Section XIV (Review of Submissions) of these Orders.
- d. In the event that an institution involved in the management of funds provided to guarantee performance under this Section, or responsible for providing such performance guarantee, becomes unable to perform its obligations, or to provide the funds or financial resources for the Work as required by these Orders, Ohio EPA shall issue a written notification to Respondents of such incapacity. Thereafter, within sixty (60) days of receipt of such notification, Respondents shall either secure proper performance of the guarantee from the institution to satisfy Ohio EPA, or submit to Ohio EPA for approval an alternative form of Financial Assurance that meets the requirements of this Section in accordance with Section XIV (Review of Submissions) of these Orders. Respondents' inability to post Financial Assurance shall in no way excuse performance of any other requirements of these Orders, including, without limitation, Respondents' obligation to complete the O&M and monitoring Work in accordance with the terms hereof.

15. Performance Failure

- a. Financial Assurance instruments provided pursuant to this Section shall provide Ohio EPA with immediate access to resources, whether in cash or in kind services, to continue and complete the O&M and monitoring Work in the event Ohio EPA determines that Respondents (1) have ceased implementation of any portion of the O&M and monitoring Work, (2) are significantly or repeatedly deficient or late in their performance of the O&M and monitoring Work, or (3) are implementing the O&M and monitoring Work in a manner that may cause a substantial threat to public health or safety or the environment. Upon making such determination, Ohio EPA shall issue a written notice ("Performance Failure Notice") to Respondents and the Financial Assurance provider of Respondents' failure to perform. The Performance Failure Notice will specify the grounds upon which such a notice was issued and will provide Respondents with a period of fourteen (14) days or a longer period of time where necessary in view of the alleged breach, as agreed by the parties, within which to initiate a

remedy of the circumstances giving rise to the issuance of such notice. Upon the expiration of the 14-day notice period, Respondents may invoke the procedures set forth in Section XV (DISPUTE RESOLUTION), to dispute Ohio EPA's determination that any of the circumstances described in clauses (1), (2) or (3) of this paragraph has occurred.

- b. Failure by Respondents to initiate a remedy for the relevant Performance Failure to Ohio EPA's satisfaction before the expiration of the notice period specified in this paragraph shall trigger Ohio EPA's right to have immediate access to and benefit of the Financial Assurance provided pursuant to this Section, and Ohio EPA may, at any time after the expiration of the notice period, order Respondents to cease performance of the Work and direct the Financial Assurance provider to immediately (1) deposit into a newly created trust fund approved by Ohio EPA, the remaining funds obligated under the Financial Assurance instrument or (2) arrange for performance of the O&M and monitoring Work in accordance with these Orders.
- c. If Ohio EPA has issued a Performance Failure Notice but is nevertheless unable after reasonable efforts to secure the resources (whether in cash or in-kind services) necessary to continue and complete the O&M and monitoring Work from the Financial Assurance instrument(s) posted by Respondents pursuant to this Section, then, upon receiving written notice from Ohio EPA, Respondents shall (in the event Respondents do not prevail in Dispute Resolution, if any, as set forth in Section XV (DISPUTE RESOLUTION) of these Orders) secure the resources available under the Financial Assurance mechanism, or deposit into an account specified by Ohio EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount equal to the Current Revised Cost Estimate.
- d. If Respondents dispute an Ohio EPA determination under this paragraph that identifies a substantial threat to public health or safety or the environment that warrants immediate action, Ohio EPA may direct the Trustee of the trust account newly-created by Ohio EPA following the Performance Failure Notice to make any appropriate payments from such trust fund to address such threat. Otherwise, Ohio EPA may direct the Trustee to not make any payments from the newly-created trust fund, pending resolution of a dispute. If Respondents prevail in dispute resolution, all funds in the newly-created trust fund, including any interest that accrued on the funds, shall be returned to a Financial Assurance provider who has agreed to continue providing Financial Assurance to Respondents.

16. Reduction of Amount of Financial Assurance

Concurrent with the submission of the Current Revised Cost Estimate, if Respondents believe that the estimated cost to complete the remaining O&M and monitoring Work has decreased below the aggregate amount of the Financial Assurance mechanism or mechanisms selected by Respondents, the Respondents may, at the time of submittal of the Current Revised Cost Estimate, submit a written request to Ohio EPA, for review in accordance with Section XIV (Review of Submissions) of these Orders, to reduce the current amount of Financial Assurance to an amount no less than the Current Revised Cost Estimate. If Ohio EPA decides to accept such a proposal, Ohio EPA shall issue a notification to the Respondents of such decision in writing. After receiving Ohio EPA's written acceptance, which shall not be unreasonably withheld, Respondents may reduce the amount of the Financial Assurance in accordance with and to the extent permitted by such written acceptance.

17. Release of Financial Assurance

Respondents may petition Ohio EPA to allow the release or discontinuance of the Financial Assurance required hereunder. Respondents shall submit a written proposal for such release to Ohio EPA for review in accordance with Section XIV (Review of Submissions) of these Orders, which shall specify the basis for the requested release (e.g., full and final completion of the O&M and monitoring Work). If Ohio EPA decides to accept such a proposal, Ohio EPA shall notify Respondents and the provider of the Financial Assurance of such decision in writing. The provider of the Financial Assurance may be released from its obligations under the instrument only upon a written release from Ohio EPA.

VIII. LAND USE AND CONVEYANCE OF TITLE

18. Land Use Self-Reporting Requirement

Respondents shall use best efforts to ensure that no portion of the Site will be used in any manner that would adversely affect the integrity of any security, containment, treatment, and/or monitoring systems at the Site. Respondents shall submit on an annual basis, written documentation verifying that any security, containment, treatment, and/or monitoring systems are in place and operational.

19. Notice of Intention to Transfer Property

Prior to each conveyance by Respondents of a deed, easement, lease or other instrument conveying an interest in any portion of the Site that is owned by Respondents, Respondents shall notify Transferee of the existence of the security,

containment, treatment, and/or monitoring systems and/or activity and use limitations and shall provide a copy of these Orders to Transferee. Respondents shall notify Ohio EPA at least thirty (30) days in advance of each conveyance of an interest in any portion of the Site that is owned by Respondents. Respondents' notice shall include the name and address of the Transferee and a description of the provisions made for the continued access to and maintenance of the security, containment, treatment, and/or monitoring systems.

20. Instrument and Confirmation of Conveyance

Upon each conveyance by Respondents of a deed, easement, lease or other instrument conveying an interest in any portion of the Property, Respondents shall include in the instrument of conveyance a restatement consistent with paragraph 10 of the Land Use Restriction Agreement to Create an Equitable Servitude, dated November 7, 2003 (Attachment D). Within thirty (30) days after each conveyance of an interest in any portion of the Site that is owned by Respondents, Respondents shall submit to Ohio EPA, via certified mail, the following information:

- a. A copy of the deed or other documentation evidencing the conveyance;
- b. The name, address, and telephone number of the new property owner and the name, address, and telephone number of the contact person for the property owner;
- c. A legal description of the Property, or the portion of the Property, being transferred;
- d. A survey map of the Property, or the portion of the Property, being transferred; and
- e. The closing date of the transfer of ownership of the Property, or portion of the Property.

IX. ADDITIONAL WORK

21. Ohio EPA or Respondents may determine that in addition to the tasks defined in the approved RD/RA Work Plan, additional Work may be necessary to accomplish the Objectives of the Parties as provided in the General Provisions Section of these Orders. Additional Work may also include, pursuant to ORC § 3734.20 or other applicable law, the implementation of interim actions to address substantial threats to public health or safety or the environment should such threats be identified during the conduct of the RD/RA.

If Ohio EPA requests additional Work that would constitute a fundamental alteration of the basic features of the remedy (e.g., scope, performance or cost), Ohio EPA shall follow the process of amending the Decision Document, which shall include the provision of public notice and opportunity to comment. In determining whether a proposed change constitutes a "fundamental alteration of the basic features of the remedy," Ohio EPA shall apply the processes outlined in the Division of Emergency and Remedial Response guidance document DERR-00-RR-013, which also references more detailed federal guidance (OSWER 9200.1-23P) to be applied in making that determination. For purposes of these Orders, each of the following changes would constitute "a fundamental alteration of the basic features of the remedy:" (a) implementation of any soil remedy other than soil vapor extraction; (b) any expansion of the ongoing soil vapor extraction remedy that cannot be accomplished using the present capacity of the operating soil vapor extraction systems at the current locations of the containers housing the soil vapor extraction blower equipment on the Site; or (c) implementation of any groundwater remedy, either on or off the Property, that is not part of the pumping and treatment activities currently being performed at the New Philadelphia City Well Field.

22. Within thirty (30) days of receipt of written notice from Ohio EPA that additional Work is necessary, unless otherwise specified in writing by Ohio EPA, Respondents shall submit a proposed addendum to the RD/RA Work Plan ("RD/RA Work Plan Addendum"), which contains (a) a work plan for the implementation of the additional Work, (b) any revisions to the Supporting Documents and other RD/RA deliverables, as appropriate, (c) a schedule for the performance of the additional Work, and (d) revisions to other schedules impacted by the additional Work, if any. If Respondents dispute the necessity of additional Work, Respondents shall initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of these Orders within fourteen (14) days after receipt of Ohio EPA's notification of the need for additional Work. Respondents shall have the right to appeal, to the Ohio Environmental Review Appeals Commission additional Work that constitutes a "fundamental alteration of the basic features of the remedy" and results in an amendment of the Decision Document, in accordance with ORC § 3745.04. The RD/RA Work Plan Addendum shall conform to the standards and requirements set forth in the documents attached to these Orders as Attachments B and C (RD/RA SOW and List of Relevant Guidance Documents). Upon approval of the RD/RA Work Plan Addendum by Ohio EPA pursuant to the Review of Submissions Section of these Orders, Respondents shall implement the approved RD/RA Work Plan Addendum in accordance with the schedules contained therein.

23. If Respondents determine that additional Work is necessary, Respondents shall submit a proposal to Ohio EPA to explain what the additional Work is, why the

additional Work is necessary, and what impact, if any, the additional Work will have on the RD/RA Work Plan and schedule. If Ohio EPA concurs with the request to perform additional Work, Respondents shall submit a RD/RA Work Plan Addendum, as described above, for the performance of additional Work. The RD/RA Work Plan Addendum shall conform to the standards and requirements set forth in the documents attached to these Orders as Attachments B and C. Upon approval of the RD/RA Work Plan Addendum by Ohio EPA pursuant to the Review of Submissions Section of these Orders, Respondents shall implement the approved RD/RA Work Plan Addendum in accordance with the schedules contained therein. Additional Work does not include any activity performed in response to an emergency at the Site for which Respondents submit to Ohio EPA written notice of the performed activity.

X. SAMPLING AND DATA AVAILABILITY

24. Unless otherwise agreed to by the Site Coordinators, Respondents shall notify Ohio EPA not less than fifteen (15) days in advance of all sample collection activity. Upon request, Respondents shall allow split and/or duplicate samples to be taken by Ohio EPA or its designated contractor. Ohio EPA shall also have the right to take any additional samples it deems necessary. Upon request, Ohio EPA shall allow Respondents to take split and/or duplicate samples of any samples Ohio EPA takes as part of its oversight of Respondents' implementation of the Work.
25. Within seven (7) days of Respondents' receipt of a request by Ohio EPA, Respondents shall submit to Ohio EPA copies of the results of all sampling and/or tests or other data, including raw data and original laboratory reports, generated by or on behalf of Respondents with respect to the Site and/or the implementation of these Orders. An electronic copy shall also be provided in a format approved by Ohio EPA. Respondents may submit to Ohio EPA any interpretive reports and written explanations concerning the raw data and original laboratory reports. Such interpretive reports and written explanations shall not be submitted in lieu of original laboratory reports and raw data. Should Respondents subsequently discover an error in any report or raw data, Respondents shall promptly notify Ohio EPA of such discovery and provide the correct information.

XI. ACCESS

26. Ohio EPA and its contractors shall have access at all reasonable times to the Site and any other property to which access is required for the implementation of these Orders, to the extent access to the property is controlled by Respondents.

Access under these Orders shall be for the purposes of conducting any activity related to these Orders including but not limited to the following:

- a. Monitoring the Work;
 - b. Conducting sampling, including background monitoring wells;
 - c. Inspecting and copying records, operating logs, contracts, and other documents related to the implementation of these Orders;
 - d. Conducting investigations, tests, and other activities associated with the implementation of these Orders; and
 - e. Verifying any data and/or other information submitted to Ohio EPA.
27. To the extent that the Site or any other property to which access is required for the implementation of these Orders is owned or controlled by persons other than Respondents, Respondents shall use reasonable efforts to secure from such persons access for Respondents and Ohio EPA and its contractors as necessary to effectuate these Orders. Copies of each access agreement obtained by Respondents shall be provided to Ohio EPA upon execution of the access agreement. If any access required to implement these Orders is not obtained prior to Respondents' submission of the RD/RA Work Plan, Respondents shall promptly notify Ohio EPA in writing of the steps Respondents have taken to attempt to obtain access. Ohio EPA may, as it deems appropriate, assist Respondents in obtaining access.
28. Notwithstanding any provision of these Orders, the State of Ohio retains all of its access rights and authorities, including enforcement authorities related thereto, under any applicable statute or regulation including but not limited to ORC §§ 3734.20 and 6111.05.

XII. DESIGNATED SITE COORDINATORS

29. Within seven (7) days of the effective date of these Orders, Respondents shall notify Ohio EPA, in writing, of the name, address, telephone number, and email address of its designated Site Coordinator and Alternate Site Coordinator.
30. As used in these Orders, the term "Site Coordinator" refers interchangeably to the Site Coordinator and the Alternate Site Coordinator designated for a named party. If any designated Site Coordinator is changed, the identity of the successor will be given to the other Party at least seven (7) days before the

changes occur, unless impracticable, but in no event later than the actual day the change is made.

31. To the maximum extent practicable, except as specifically provided in these Orders, communications between Respondents and Ohio EPA concerning the implementation of these Orders shall be made between the Site Coordinators. Respondents' Site Coordinator shall be available for communication with Ohio EPA regarding the implementation of these Orders for the duration of these Orders. Each Site Coordinator shall be responsible for ensuring that all communications from the other Party are appropriately disseminated and processed. Respondents' Site Coordinator shall be present on the Site or on call during all hours of Work at the Site.
32. Without limitation of any authority conferred on Ohio EPA by statute or regulation, Ohio EPA's Site Coordinator's authority includes but is not limited to the following:
 - a. Directing the type, quantity and location of samples to be collected by Respondents pursuant to an approved Work Plan;
 - b. Collecting samples;
 - c. Observing, taking photographs, or otherwise recording information related to the implementation of these Orders, including the use of any mechanical or photographic device;
 - d. Directing that the Work stop whenever Ohio EPA's Site Coordinator determines that the activities at the Site may create or exacerbate a threat to public health or safety, or threaten to cause or contribute to air or water pollution or soil contamination;
 - e. Conducting investigations and tests related to the implementation of these Orders;
 - f. Inspecting and copying records, operating logs, contracts and/or other documents related to the implementation of these Orders; and
 - g. Assessing Respondents' compliance with these Orders.

XIII. PROGRESS REPORTS AND NOTICE

33. Unless otherwise agreed to by the Parties, Respondents shall submit a written quarterly progress report to the Ohio EPA at the end of February, April, July and

October each year. At a minimum, the progress reports shall include that information designated in Section 10 of the SOW. Quarterly reports may not be used to propose modifications to approved plans; Respondents shall submit such requests to Ohio EPA in a separate written correspondence.

34. Progress reports (one copy only) shall be sent either by e-mail with confirmed receipt or by hard copy to the address listed below. All other documents (two copies) required to be submitted pursuant to these Orders to Ohio EPA shall be sent to the following agency address:

Kevin O'Hara
DERR Site Coordinator - Ohio EPA
Southeast District Office
2195 Front Street
Logan, OH 43138

Email address: Kevin.O'Hara@epa.state.oh.us

All written (including electronic) correspondence to Respondents shall be directed to:

For Joy Mining Machinery:
Paul Winkler
Director Environmental, Health & Safety
Joy Mining Machinery
177 Thorn Hill Road
Warrendale, PA 15086

For Howden Buffalo Inc.:
Paul Stewart
General Manager
338 South Broadway
New Philadelphia, OH 44663

With copies to:

Karina Livshin, Esq.
Vice President and General Counsel
Joy Mining Machinery
177 Thorn Hill Road
Warrendale, PA 15086

Kevin Garber, Esq.
Babst Calland Clements & Zomnir
Two Gateway Center
Pittsburgh, PA 15222

A Party may designate an alternative contact name or address upon written notification to the other Party and in accordance with the Designated Site Coordinators Section of these Orders, as applicable.

XIV. REVIEW OF SUBMISSIONS

35. Ohio EPA shall review any work plan, report, or other item required to be submitted pursuant to these Orders.
36. Upon review, Ohio EPA may in its sole discretion: (a) approve the submission in whole or in part; (b) approve the submission with specified conditions; (c) modify or, modify and approve, the submission; (d) disapprove the submission in whole or in part; or (e) any combination of the above. The results of Ohio EPA's review shall be detailed in writing and shall identify any conditions, modifications and/or deficiencies. Excluded from Ohio EPA approval, pursuant to this Section, are the health and safety plan (HASP) and progress reports.
37. In the event that Ohio EPA approves an initial submission, Respondents shall proceed to take such action as required by Ohio EPA. In the event that Ohio EPA approves with conditions or modification an initial submission, Respondents shall either (a) proceed to take such action as required by Ohio EPA, or (b) initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of these Orders, within fourteen (14) days of receipt of Ohio EPA's written response to Respondents' submission. Respondents shall proceed to take any action required by an unmodified or unconditioned portion of the submission, as those portions are considered approved.
38. In the event that Ohio EPA disapproves an initial submission in whole or in part and notifies Respondents in writing of the deficiencies, Respondents shall within fourteen (14) days, or such longer period of time as specified by Ohio EPA in writing, correct the deficiencies, and/or incorporate the conditions, and submit a revised submission to Ohio EPA for approval. The revised submission shall incorporate all of the changes, additions, and/or deletions specified by Ohio EPA in its notice of disapproval. Revised submissions shall be accompanied by a letter indicating how and where each of Ohio EPA's comments was incorporated into the revised submission. To facilitate review of the revised submission, those portions of the document not affected by the Ohio EPA comments should remain

unchanged. The letter accompanying the submission should indicate, however, any indirect changes necessitated by Ohio EPA's comments.

39. To the extent that Respondents dispute any of Ohio EPA's changes, additions, and/or deletions to an initial submission, Respondents shall initiate the procedures for dispute resolution set forth in the Dispute Resolution Section of these Orders, within fourteen (14) days after receipt of Ohio EPA's written notice of disapproval. Notwithstanding the disapproval, Respondents shall proceed to take any action required by a portion of the submission that is not specified as disapproved in the notice of disapproval.
40. In the event that Ohio EPA disapproves or modifies a revised submission, in whole or in part, and notifies Respondents in writing of the deficiencies, Respondents shall within fourteen (14) days, or such longer period of time as specified in writing by Ohio EPA, correct the deficiencies and incorporate all changes, additions, and/or deletions, and submit the revised submission to Ohio EPA for approval. If Respondents fail to submit a revised submission incorporating all changes, additions, modifications and/or deletions within fourteen (14) days, or such longer period of time as specified by Ohio EPA in writing, Respondents shall be considered in breach and/or violation of these Orders. If Respondents are in breach and/or violation of these Orders, Ohio EPA retains the right to perform any additional remediation, conduct a complete or partial Remedial Design or Remedial Action; and/or enforce the terms of these Orders as provided in the Reservation of Rights Section of these Orders.
41. All work plans, reports, or other items required to be submitted to Ohio EPA under these Orders shall, upon approval by Ohio EPA, be deemed to be incorporated in and made an enforceable part of these Orders. In the event that Ohio EPA approves a portion of a work plan, report, or other item, the approved portion shall be deemed to be incorporated in and made an enforceable part of these Orders.

XV. DISPUTE RESOLUTION

42. The Site Coordinators shall, whenever possible, operate by consensus.
43. In the event of a disapproval, or an approval with condition(s) or modification(s) by Ohio EPA of a submission by Respondents, or a disagreement regarding any work plan, report or other item required to be submitted pursuant to these Orders, Respondents' Site Coordinator shall notify Ohio EPA's Site Coordinator in writing that Respondents wish to invoke an informal dispute pursuant to this Section. The notification to invoke an informal dispute shall occur prior to the submission deadline.

44. The Parties shall have ten (10) days from the date written notice of the informal dispute is received by Ohio EPA's Site Coordinator to negotiate in good faith to resolve the dispute. This informal dispute resolution period may be extended by agreement of the Site Coordinators for up to twenty (20) additional days.
45. In the event that the dispute is not resolved during the informal dispute resolution period, Respondents' Site Coordinator shall notify Ohio EPA's Site Coordinator in writing by the end of the informal dispute resolution period that Respondents wish to invoke a formal dispute pursuant to this Section. This notice shall include a brief description of the item(s) in dispute. Within twenty (20) days of receipt of the written notice invoking the formal dispute resolution procedure, the Site Coordinators shall exchange written positions, including technical rationale supporting their positions. The Site Coordinators shall have ten (10) days from the last date that the written position is received by any party to negotiate in good faith to resolve the formal dispute. This formal dispute period may be extended by agreement of the Site Coordinators for up to twenty (20) additional days.
46. In the event the dispute is not resolved in the formal dispute resolution period, Respondents' Site Coordinator shall notify Ohio EPA's Site Coordinator in writing by the end of the formal dispute resolution period whether Respondents wish to submit final written positions to the Chief of Ohio EPA's Division of Emergency and Remedial Response (DERR), or his/her designee (who shall be someone from Central Office at Manager level or above with appropriate expertise in the area of dispute). The Site Coordinators shall have ten (10) days from the end of the formal dispute resolution period to submit their written positions. Within thirty (30) days of receipt of the last written position, the Chief of DERR or his/her designee will endeavor to issue a written resolution of the dispute to the Respondents. The resolution will be based upon and consistent with these Orders, the SOW, the RD/RA Work Plan, and applicable or relevant and appropriate federal and state laws. The decision of DERR is considered final for the purposes of these Orders.
47. The pendency of a dispute under this Section shall extend only the time period for completion of the item(s) in dispute, except that upon mutual agreement of the Site Coordinators, any time period may be extended as is deemed appropriate under the circumstances. Such agreement shall not be unreasonably withheld by Ohio EPA. Elements of the Work not affected by the dispute shall be completed in accordance with the applicable schedules and time frames.
48. This Section applies to the Section XVII (Reimbursement of Costs) in accordance with Paragraph 55d of that Section.

XVI. UNAVOIDABLE DELAYS

49. Respondents shall cause all Work to be performed in accordance with applicable schedules and time frames set forth in these Orders or any approved work plan unless any such performance is prevented or delayed by an event that constitutes an unavoidable delay. For purposes of these Orders, an "unavoidable delay" shall mean an event beyond the control of Respondents that prevents or delays performance of any obligation required by these Orders and that could not be overcome by due diligence on the part of Respondents. Increased cost of compliance, among other circumstances, shall not be considered an event beyond the control of Respondents for the purposes of these Orders.
50. Respondents shall notify Ohio EPA in writing within ten (10) days after the occurrence of an event that Respondents contend is an unavoidable delay. Such written notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by Respondents to minimize the delay, and the timetable under which these measures will be implemented. Respondents shall have the burden of demonstrating that the event constitutes an unavoidable delay.
51. If Ohio EPA does not agree that the delay has been caused by an unavoidable delay, Ohio EPA will notify Respondents in writing of that finding and of the noncompliance with these Orders. If Ohio EPA agrees that the delay is attributable to an unavoidable delay, Ohio EPA will notify Respondents in writing of the length of the extension for the performance of the obligations affected by the unavoidable delay.

XVII. REIMBURSEMENT OF COSTS

52. Ohio EPA has incurred and continues to incur Response Costs in connection with the Site. Respondents shall reimburse Ohio EPA for all Response Costs incurred both prior to and after the effective date of these Orders.
53. Within thirty (30) days of the effective date of these Orders, Respondents shall remit a check to Ohio EPA in the amount of \$29,044.16 which represents all past Response Costs owed up to and including December 31, 2009.
54. For Response Costs incurred after December 31, 2009, Ohio EPA will submit to Respondents on an annual basis an itemized invoice of its Response Costs for the previous year. Within thirty (30) days of receipt of such itemized invoice, Respondents shall remit payment for all of Ohio EPA's Response Costs for the

previous year. In the event that Respondents do not remit payment of Response Costs within sixty (60) days after receipt of such invoice, Respondents shall remit payment for unpaid balance and the interest accrued on the unpaid balance. Interest shall accrue beginning thirty (30) days from the date of the invoice until the date payment is remitted, and shall be calculated at the rate specified by ORC § 5703.47(B) or any subsequent rate adjustments.

55. Respondents shall remit payments to Ohio EPA pursuant to this Section as follows:

a. Payment shall be made by bank check payable to "Treasurer, State of Ohio / Hazardous Waste Special Cleanup Account" and shall be forwarded to Office of Fiscal Administration, Attn: Brenda Case, Ohio EPA, Lazarus Government Center, P.O. Box 1049, Columbus, Ohio 43216-1049;

b. A copy of the transmittal letter and check shall be sent to the Fiscal Officer, DERR, Ohio EPA, P.O. Box 1049, Columbus, Ohio 43216-1049, and to the Ohio EPA Site Coordinator; and

c. Each payment shall identify the name and address of the party making payment, the Site name, and Ohio EPA's revenue number identified on the associated invoice.

d. The provisions of Section XV, Dispute Resolution, shall apply if Respondents object to the accuracy of any request for payment of Response Costs or if the Respondents do not agree that a Response Cost is not inconsistent with the NCP. Should Respondents contest portion of the Response Costs set forth in an itemized statement, but not all of the costs, Respondents shall timely pay the uncontested portion of Response Costs pursuant to this Section, Reimbursement of Costs. Any Response Costs which Respondents must pay as a result of dispute resolution shall be paid within thirty (30) days of the date of the resolution of the dispute.

XVIII. ACCESS TO INFORMATION

56. Upon request, Respondents shall provide to Ohio EPA within fourteen (14) days, copies of all documents and information within its possession or control or that of its contractors or agents relating to events or conditions at the Site including but not limited to manifests, reports, correspondence, or other documents or information related to the Work. This provision shall not be a limitation on any request for information to Respondents by Ohio EPA made under state or federal law for information relating to events or conditions at the Site.

57. Respondents may assert a claim that documents or other information submitted to Ohio EPA pursuant to these Orders are confidential under the provisions of OAC 3745-50-30(A) or ORC § 6111.05(A). If no such claim of confidentiality accompanies the documents or other information when it is submitted to Ohio EPA, it may be made available to the public without notice to Respondents.
58. Respondents may assert that certain documents or other information are privileged under the attorney-client privilege or any other privilege recognized by state law. If Respondents make such an assertion, it shall provide Ohio EPA with the following: (1) the title of the document or information; (2) the date of the document or information; (3) the name and title of the author of the document or information; (4) the name and title of each addressee and recipient; (5) a general description of the contents of the document or information; and (6) the privilege being asserted by Respondents.
59. No claim of confidentiality shall be made with respect to any data or reports, including but not limited to laboratory or interpretive reports, and all sampling, analytical, and monitoring data.
60. Respondents shall preserve for the duration of these Orders and for a minimum of five (5) years after termination of these Orders, all documents and other information within its possession or control, or within the possession or control of its contractors or agents, which in any way relate to the Work notwithstanding any document retention policy to the contrary. Respondents may preserve such documents by microfiche or other electronic or photographic device. At the conclusion of this document retention period, Respondents shall notify Ohio EPA at least sixty (60) days prior to the destruction of these documents or other information; and upon request, shall deliver such documents and other information to Ohio EPA.

XIX. PERIODIC REVIEW

61. Respondents shall conduct studies and investigations as requested by Ohio EPA in order to permit Ohio EPA to conduct reviews as to the effectiveness of the Remedial Action at least every five (5) years as described in section 121(c) of CERCLA and any applicable regulations.
62. If Ohio EPA determines that information received, in whole or in part, during a review conducted pursuant to the Periodic Review Section of these Orders indicates that the Remedial Action is not protective of public health and safety and the environment, Respondents shall undertake any further response actions Ohio EPA has determined are appropriate. Respondents shall submit a plan for such work to Ohio EPA for approval in accordance with the procedures set forth

in the Review of Submissions Section of these Orders, within thirty (30) days of receiving a request from Ohio EPA to submit such a work plan.

63. Respondents may invoke the procedures in the Dispute Resolution Section to dispute (1) Ohio EPA's determination that the Remedial Action is not protective of public health and safety and the environment, or (2) Ohio EPA's selection of further response actions.

XX. MODIFICATIONS

64. These Orders may be modified by agreement of the Parties. Modifications shall be in writing, signed by the authorized representative of the Respondents and by the Director, and shall be effective on the date entered in the Journal of the Director of Ohio EPA.

XXI. INDEMNITY

65. Respondents agree to indemnify, save, and hold harmless Ohio EPA from any and all claims or causes of action arising from, or related to, the implementation of these Orders or to events or conditions at the Site caused by any acts or omissions of Respondents, their agents or anyone acting on their behalf. Said indemnification shall not apply to acts or omissions of the State of Ohio, its employees, agents or assigns at, on, upon, or related to the Site if said acts are negligent, performed outside the scope of employment or official responsibilities, or performed with malicious purpose, in bad faith, or in a wanton or reckless manner. Ohio EPA shall not be considered a party to and shall not be held liable under any contract entered into by Respondents in carrying out the activities pursuant to these Orders. Ohio EPA agrees to provide notice to Respondents within thirty (30) days after receipt of any claim that may be the subject of indemnity as provided in this Section, and to cooperate with Respondents in the defense of any such claim or action against Ohio EPA.

XXII. CONTRIBUTION AND AGREEMENT NOT TO REFER

66. With respect to matters addressed in these Orders, the Parties hereto agree that these Orders constitute an administrative settlement for purposes of CERCLA sections 113(f)(2) and 113 (f)(3)(B), 42 U.S.C. § 9613(f)(2) and § 9613(f)(3)(B), pursuant to which Respondents have resolved their liability to the State, and that the Respondents are entitled to contribution protection and contribution rights as the effective date of these Orders as to any liable persons who are not parties to these Orders, as provided by CERCLA section 113(f)(2) and (f)(3)(B), 42 U.S.C. § 9613(f)(2) and (f)(3)(B), provided that Respondents comply with these Orders. The "matters addressed" in these Orders are all investigative and remedial

actions taken or to be taken and all response costs incurred or to be incurred by Ohio EPA or any other person with respect to the Site, including without limitation the Work and Response Costs under these Orders.

67. During the implementation of these Orders, and provided Ohio EPA has not notified Respondents in writing that Respondents are not in compliance with these Orders, Ohio EPA agrees not to refer Respondents to the Ohio Attorney General's Office for enforcement, or take administrative enforcement action against Respondents or their successors in interest liable under Ohio law for Work required under these Orders at the Site. Upon termination of these Orders pursuant to the Termination Section, Ohio EPA agrees to not refer Respondents to the Ohio Attorney General's Office for enforcement, or take administrative enforcement action against Respondents and their successors in interest liable under Ohio law for Work required under these Orders at the Site.

XXIII. OTHER CLAIMS

68. Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation not a Party to these Orders, for any liability arising from, or related to, events or conditions at the Site.

XXIV. RESERVATION OF RIGHTS

69. Ohio EPA reserves the right to seek legal and/or equitable relief to enforce the terms and conditions of these Orders, including penalties against Respondents for noncompliance with these Orders. Except as provided herein, Respondents reserve any rights they may have to raise any legal or equitable defense in any action brought by Ohio EPA to enforce the terms and conditions of these Orders.
70. Ohio EPA reserves the right to terminate these Orders and/or perform all or any portion of the Work or any other measures in the event that the requirements of these Orders are not wholly complied with within the time frames required by these Orders. Ohio EPA shall give Respondents thirty (30) days prior notice of its intent to terminate these Orders under this paragraph unless Ohio EPA determines that an emergency exists requiring immediate action to protect the public health or safety or the environment.
71. Ohio EPA reserves the right to take any action, including but not limited to any enforcement action, action to recover costs, or action to recover damages to natural resources, pursuant to any available legal authority as a result of past, present, or future violations of state or federal laws or regulations or the common law, and/or as a result of events or conditions arising from, or related to, the Site.

Respondents reserve any rights they may have to raise any legal or equitable defense in any such action brought by Ohio EPA. Upon termination pursuant to the Termination Section of these Orders, Respondents shall have resolved their liability to Ohio EPA only for the Work performed pursuant to these Orders.

XXV. TERMINATION

72. Respondents' obligations under these Orders shall terminate upon Ohio EPA's written approval of Respondents' written certification to Ohio EPA that all Work required to be performed under these Orders, including payment of Response Costs, has been completed. The Respondents' certification shall contain the following attestation: "We certify that the information contained in or accompanying this certification is true, accurate, and complete." This certification shall be submitted by Respondents to Ohio EPA and shall be signed by a responsible official of Respondents. The termination of Respondents' obligations under these Orders shall not terminate the Respondents' obligations under the Access to Information, Indemnity, Other Claims, Contribution and Agreement Not to Refer, and Land Use and Conveyance of Title Sections of these Orders.

XXVI. WAIVER AND AGREEMENT

73. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondents consent to the issuance of these Orders, and agree to comply with these Orders.

74. Except as otherwise provided in these Orders, Respondents hereby waive the right to appeal the issuance, terms and conditions, and service of these Orders and Respondents hereby waive any and all rights that they may have to seek administrative or judicial review of these Orders either in law or equity.

75. Notwithstanding the waiver herein of Respondents' right to appeal or seek administrative or judicial review, Ohio EPA and Respondents agree if these Orders are appealed by any other party to the Environmental Review Appeals Commission, or any court, Respondents retain the right to intervene and participate in such appeal. In such event, Respondents shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

XXVII. EFFECTIVE DATE

76. The effective date of these Orders shall be the date these Orders are entered in the Journal of the Director of Ohio EPA.

77. Upon the effective date of these Orders, the Interim Action Orders that became effective on January 29, 2001 shall be terminated except for the obligation to continue implementing the interim action approved under paragraph 12 of the Interim Action Orders and the obligation to report sample results and data concerning the interim action under paragraph 16 of the Interim Action Orders, which shall be incorporated into these Orders unless otherwise modified pursuant to these Orders.

XXVIII. SIGNATORY AUTHORITY

78. Each undersigned representative of a Party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such Party to these Orders.

IT IS SO ORDERED AND AGREED:

OHIO ENVIRONMENTAL PROTECTION AGENCY



Chris Korleski, Director
Ohio Environmental Protection Agency

1/3/11
Date

IT IS SO AGREED:

Joy Mining Machinery

BY: 

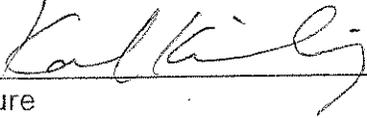
Signature

12/6/10
Date

P.M. SANDERS VP & MD
Printed Name & Title

Howden Buffalo Inc.

BY:



Signature

12/17/2010

Date

KARL KIMBERLING

Printed Name & Title

PRESIDENT & CEO

Howden North America Inc.

fka Howden Buffalo Inc.

Attachment A

Decision Document

Attachment B

RD/RA SOW

Attachment C

List of Relevant Guidance Documents

Attachment D

Land Use Restriction Agreement to Create an Equitable Servitude

ATTACHMENT A

Ohio Environmental Protection Agency's

Decision Document
for the

Joy Mining Machinery Site
(the former Joy Technologies Inc. Site)
New Philadelphia, Ohio

February 2000

OHIO E.P.A.
JAN 29 2001
ENTERED DIRECTOR'S JOURNAL

Declaration for the Decision Document
Joy Mining Machinery
New Philadelphia, Ohio

Introduction

This Decision Document presents the selected remedial action for the former Joy Technologies Inc. site (Joy) in New Philadelphia, Ohio. This site is now under new ownership and operates under the name New Philadelphia Fan Company. The former Joy Technologies Inc. has also undergone a name change and is now known as Joy Mining Machinery. This document summarizes the site history, the Remedial Investigation (RI) and the Feasibility Study (FS) and the clean-up alternatives evaluated in the FS and presented in the Preferred Plan for the site. The Decision Document presents the Ohio EPA's selected alternative to clean-up the site contamination and the rationale and justification for that preference. The Decision Document also incorporates responses to comments received during the public comment period on the Preferred Plan. Ohio EPA's Responsiveness Summary, detailing the comments received and Ohio EPA's responses, is attached to this document.

Community Participation

Public documents pertaining to past and future activities at the former Joy Technologies Inc., including the RI/FS and other documents pertaining to the investigation, are available to the public at the Ohio EPA Southeast District Office in Logan, Ohio.

A document repository has been established in Tuscarawas County Public Library in New Philadelphia, Ohio. The document repository contains copies of the RI/FS and the Preferred Plan. A copy of this Decision Document will be added to the repository. Copies of all final design documents and site reports will also be added to the repository after they are received and approved by the Ohio EPA.

Description of the Selected Remedy

The selected remedial action for the Joy site addresses the sources of contamination by using a soil vapor extraction (SVE) system to remove the contaminants from soil and by treating contaminated ground water. Institutional controls such as deed restrictions will also be a component of the remedy.

The soil remedial alternative will consist of the following:

- (1) a SVE system to remove the contaminants from soils in each of the three areas of greater relative TCE contamination and in the area of PCE contamination,

- (2) compliance of emissions from SVE system with air regulations and if necessary emissions treatment, and
- (3) a soil sampling program and an air monitoring program to track contaminant levels, evaluate the effectiveness of the SVE system, ensure compliance with the SVE system's air permit and determine when the clean-up levels have been attained.

The ground water remedial alternative will consist of the following:

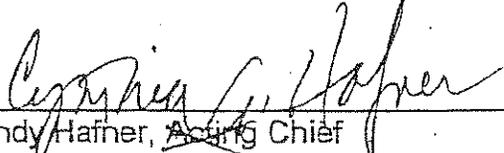
- (1) continued capture of the contaminated ground water plume with the City of New Philadelphia's production wells,
- (2) continued use of the air stripper towers at the City wellfield to remove the VOCs from the contaminated ground water,
- (3) monitoring well sampling program to determine the pumping rate for the New Philadelphia production wells that is necessary to contain the plume and monitoring to track contaminants and ensure that the plume is not moving beyond the City wellfield, and
- (4) monitoring of the drinking water distributed from the production wells to ensure air stripper towers are removing VOCs to levels below the maximum contaminant levels (MCLs) established by U.S.EPA and monitoring for discharge permit compliance of any effluent water being discharged as a result of the need to pump the production wells at rates greater than the supply demand.

Institutional controls will consist of the following:

- (1) deed restrictions placed on the Joy site property deed to prohibit installation of ground water wells (other than for monitoring use), prohibit use of the ground water beneath the site until clean-up levels are reached, restrict use of the property to industrial use, and prohibit unauthorized digging and excavation in the area formerly used for PCB storage, and
- (2) access restrictions in areas of VOC soil contamination until risk based VOC clean-up goals are met and access restrictions in the PCB area to remain in effect as long as the PCB contaminated soil is on site.

The remedy selected by Ohio EPA allows PCB contamination in the soils to be left in place. This alternative for the PCB contamination was selected because Ohio EPA believed that excavation, the other alternative for the PCBs, was not practicable when considering the eight selection criteria, including cost. Procedures under the U.S. Environmental

Protection Agency's National Contingency Plan (NCP) call for a periodic review to ensure that the remedy will protect human health and the environment.



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2/20/00
Date

Decision Summary
for the

Joy Mining Machinery Site
(the former Joy Technologies Inc. Site)
New Philadelphia, Ohio

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I. SITE DESCRIPTION AND HISTORY

New Philadelphia Fan Company currently operates the facility located at the Joy site in Tuscarawas County, Ohio in the City of New Philadelphia (Figure 1). The facility currently is involved in the manufacture of ventilation fans, as it has been since the early 1960's. The site (Joy) was acquired by the former Joy Manufacturing Company during the mid 1940's, at which time it existed, in part, as a foundry operation. Joy Manufacturing Company later became Joy Technologies Inc. and is now known as Joy Mining Manufacturing. In 1997, Joy Technologies sold the New Philadelphia facility, and the New Philadelphia Fan Company currently operates a fan manufacturing business at the facility. From about 1960 through 1975, solvents and hydraulic oil containing PCBs were used at the site as a part of the production of electrical connectors and conveyor system components. With the exception of small quantities of paint thinners (e.g. toluene), solvents have not been used at Joy since around 1975.

In 1981, trichloroethene (TCE), which is a volatile organic compound (VOC), was detected in the ground water pumped from the New Philadelphia municipal supply wells. In 1987, a study done for the City of New Philadelphia by The Ohio Drilling Company reported that one source of the VOCs detected in the ground water from the municipal well was originating from beneath the northwestern corner of the Joy property.

In 1987, Joy engaged the consulting firm of O'Brien & Gere to conduct a further study of the Joy property. The analyses of soil samples taken as a part of this study indicated the presence of VOCs, predominantly TCE, trans-1,2-dichloroethene (DCE), and tetrachloroethene (PCE). Other VOCs were also detected in the soil samples but at levels generally at or near the analytical detection limit. The VOCs detected at these lower concentrations were ethylbenzene, xylene, 1,1,1-trichloroethane, 1,1-dichloroethane, toluene, and methylene chloride. The study done by O'Brien & Gere also included analyses of ground water samples from the site. The ground water analyses detected TCE and DCE.

On July 8, 1987, U.S. EPA established a maximum contaminant level (MCL) of 5 ug/L for TCE in drinking water, to take effect on January 8, 1989. Because the level of TCE in the water from the New Philadelphia municipal supply wells was above the newly promulgated MCL, the City installed two air stripper towers at the wellfield to reduce the VOCs in the water to meet the new MCLs before distributing it for drinking. These air strippers were constructed in mid-1988 and are still in operation today.

In May of 1990, Ohio EPA and Joy Technologies entered into an Administrative Order on Consent (AOC) requiring Joy Technologies to conduct a Remedial Investigation (RI) to determine the nature and extent of any release or threatened release of contaminants from the Joy facility.

II. NATURE AND EXTENT OF CONTAMINATION

Joy Technologies, with Ohio EPA oversight, conducted a RI in two phases from June 1990 until June 1994. The three main objectives of the RI were: (1) to characterize the contaminants present at the site, (2) to determine the actual or potential hazard to public health and the environment, and (3) to gather sufficient data to identify and assess potential remedial alternatives and support the detailed evaluation of those alternatives during the Feasibility Study (FS).

Source Areas

The RI included soil-vapor surveys and analyses of soil samples. The soil-vapor and the soil sampling data indicated that in the shallow soils beneath the Joy property there are three areas of greater relative TCE contamination and one area of PCE contamination. Two of these areas are located in the western portion of the site - one north of the area referred to on figure 2 as the "Test Pad" and one in the northwest corner of the facility in the former drum storage area. The third area of TCE contamination is located in the east-central portion of the site, just north of the MW-4 well cluster (see figure 2). Because precipitation infiltrating through soils is considered to be the predominant mechanism by which VOCs enter the alluvial aquifer, these areas of greater relative TCE and PCE concentrations are considered to be the sources, on the Joy site, of VOCs detected in the ground water.

Analyses of ground water and surface soil samples also detected the presence of PCBs in the northwest corner of the site. This area of PCB contamination is within one of the TCE contaminated areas. The mobility of PCBs is normally very minimal in soils. However, in the presence of VOCs such as TCE, the mobility of PCBs increases. Increased mobility of the PCBs due to VOC presence may be the reason that PCBs were found in the ground water at the site. PCBs have not been found downgradient of the monitoring well in which they were detected. Based on the information available, PCBs are not expected to migrate to the City wellfield.

Soils

During the RI, soil vapor samples were collected in 87 locations at the site. The soil vapor data indicated three areas of greater relative TCE contamination and one area of PCE contamination. Soil samples were then taken from 18 soil borings at the site and sampled for VOCs. TCE concentrations were reported in 15 of the soil boring locations, with concentrations ranging from 6 parts per billion to 33,000 parts per billion. PCE was detected in the soils at 6 of the sampling locations with the highest concentration being 20,000 parts per billion.

Other VOCs that were detected in the soil samples taken included: toluene, 4-methyl-2-

pentanone, and 1,2-dichloroethene. In general, the analytical data from soil samples analyzed during the RI are consistent with the findings of the soil vapor surveys.

After PCBs were detected in the ground water, surficial soil sampling was done in three locations in the area where hydraulic oil containing PCBs was managed. In two of the three surface sample locations PCBs were detected. The levels of PCBs detected were 9.2 parts per billion and 1600 parts per billion. Because of these PCB detections deeper soil samples were then collected from six boring locations in this area. In three of the six boring locations PCBs were again detected. These PCB detections ranged from 110 parts per billion to 21,000 parts per billion. The 0-2 foot depth samples had lower levels of PCBs detected than the samples taken from 4-6 foot, 5-7 foot, and 10-12 foot depths.

Ground Water

The primary ground water supply aquifer in the New Philadelphia area occurs within the sand and gravel out-wash deposits and is commonly referred to as the alluvial aquifer. The alluvial aquifer is estimated to be 200 feet thick, and the depth to ground water is typically from 10 to 15 feet below ground surface.

Under current conditions, ground water in the alluvial aquifer beneath the Joy facility is influenced by the pumping of the production wells in the City of New Philadelphia wellfield. The average combined pumping rate for the municipal wells typically ranges from around 2.5 million gallons per day (MGD) to over 4 MGD, based on seasonal demands of the City. Water level data collected during the RI and Additional Work indicated that pumping of the City wellfield can effectively contain the plume provided that the total pumping rate of the wellfield is maintained above an average daily rate of about 2.75 MGD. The ground water flow velocities beneath the Joy facility have been calculated to be on the order of 850 feet per year. At this velocity, ground water from the furthest point downgradient on the Joy property would take approximately four months to reach the municipal wellfield. Prior to the RI, there were 3 existing monitoring wells on or near Joy property and 6 monitoring wells at the City wellfield. An additional 20 monitoring wells were installed during the RI process.

III. SUMMARY OF SITE RISKS

The risk assessment evaluated the potential risks to human health and the environment associated with exposure to constituents in soil and ground water at the Joy facility. The assessment of the risks was based on the U.S. EPA guidance documents "Risk Assessment Guidance for Superfund" (1991,1989). The risk assessment included identification of chemicals of concern, a toxicological assessment, and exposure assessment risk characterization.

Identification of Chemicals of Concern

Data collected from sampling of the ground water, soil and stripper tower effluent was used to identify Chemicals of Concern (COC) to be evaluated in the risk assessment. The COCs for the site are listed below:

<u>VOCs</u>	<u>Semi-VOCs</u>	<u>Inorganics</u>
Acetone	bis(2-ethylhexyl)phthalate	Antimony
Benzene	Di-n-butylphthalate	Arsenic
2-Butanone	Diethylphthalate	Chromium
Carbon disulfide	Fluoranthene	Copper
1,1-Dichloroethane	Phenanthrene	Cyanide
1,1-Dichloroethene	Pyrene	Fluoride
1,2-Dichloroethene		Selenium
Ethylbenzene	<u>PCBs</u>	Thallium
Methylene chloride	Aroclor-1254	
4-Methyl-2-pentanone		
Tetrachloroethene		
Toluene		
1,1,1-Trichloroethane		
Trichloroethene		
Vinyl chloride		

Toxicological Assessment

The risks associated with exposure to constituents detected at Joy are a function of the inherent toxicity (i.e. hazard) of the constituents and the exposure dose. The hazard characterization considers general toxic effects, carcinogenic effects, and non-carcinogenic effects of the COCs. Further information on the toxic effects of the COCs at Joy can be found in Table 29 of the RI report.

Exposure Assessment

In the exposure characterization of the risk assessment, information about the site and the physical/chemical properties of the COCs were combined to assess the potential for human exposure to the COCs detected in the ground water and soil at the Joy facility.

Two time frames were considered in the risk assessment: (1) the current risk, or the risk from the Joy facility as it exists today; and (2) the potential future risks from the facility assuming no remedial action. In order to characterize the exposure at the site the following factors were identified: the sources of the COCs, the primary release and transport mechanisms, the media affected, the points for exposure or potential exposure, the exposure routes, and the receptors. Based on this information, an exposure dose was calculated for current conditions and for future conditions. Exposure dose was calculated for the current site worker, current off-site resident, hypothetical future resident, and hypothetical future excavation worker.

Exposure Dose Calculations-Current Use

Currently there are no water supply wells in use on the Joy property, nor are there any water supply wells between the Joy facility and the downgradient municipal wellfield. The municipal supply wells, located 300 feet from Joy, are contaminated with VOCs above the maximum contaminant level established by the Safe Drinking Water Act. Air strippers, which were installed in 1988, currently remove VOCs from the municipal water supply system prior to distribution. Therefore, under current conditions, ground water exposure is limited to workers and off-site residents exposed to ground water that has been pumped from the municipal wellfield and treated by the air strippers.

The current site worker scenario describes potential exposure to surface soils and to ground water treated by the stripper towers. Daily ground water exposure doses for the current worker were calculated for exposure via dermal contact and for ingestion. The surficial soil exposure dose calculated for the current worker was based on incidental ingestion, dermal contact, and vapor inhalation.

The exposure of current off-site residents was modeled because their water supply is from the ground water after treatment by air strippers. For the current off-site residents, dose was calculated based on exposure via ingestion, dermal contact while bathing, and inhalation of vapors released to indoor air during indoor activities.

Exposure Dose Calculations - Future Use

The exposure under hypothetical future residential use was modeled based on the assumption that in the future the Joy property will be developed for residential use with potable wells drilled on site. Under this scenario it was also assumed that the municipal wells will have stopped pumping; and therefore, the contaminated ground water will have discharged into the Tuscarawas River, which was assumed to be used recreationally by future residents. Discharge of the ground water into the Tuscarawas River was modeled to offer comparison to current conditions. Exposure dose from ground water was calculated based on exposure via ingestion, dermal contact while bathing, inhalation of vapors released to indoor air during indoor activities, swimming, and fish ingestion. In the case of exposure to soil contamination, the exposure dose was calculated for surficial and subsurface soil exposure occurring via ingestion, dermal contact, and vapor inhalation.

The exposure under a hypothetical future excavation worker use was modeled under the assumption that future development of the site could require excavation and regrading. The exposure dose was therefore calculated for exposure via ingestion, dermal contact, and vapor inhalation.

Risk Characterization

This step involves calculating estimates of carcinogenic (cancer causing) and non-carcinogenic risks from chemicals of concern for different exposure pathways. Cancer risk is defined as the probability of an individual developing cancer over a lifetime as a result

of exposure to a potential carcinogen in addition to the probability of cancer risks from all other causes. As a benchmark in developing clean-up goals at contaminated sites, an acceptable range of excess lifetime cancer risk (ELCR) from one in one million (1×10^{-6}) to one in ten thousand (1×10^{-4}), has been established. The point of departure or program goal for risk remaining after a site is cleaned up is 1×10^{-6} (i.e., a one in one million excess lifetime cancer risk, above and beyond risks from other unrelated causes) and is the risk goal for the Joy site.

The "Hazard Quotient" (HQ) is used to measure the severity of non-cancerous hazards posed at a site. The HQ is determined by dividing the chronic daily intake (CDI) by the reference dose (RfD). The reference dose is the amount of material that is determined to cause a toxic effect. If the HQ is less than or equal to 1, then the estimated exposure to a substance represented by the CDI is judged to be below the threshold that could result in a toxic effect. An HQ greater than 1 indicates that a toxic effect may result. To assess the cumulative effect of similar non-cancerous substances, the HQ for all of the substances being assessed at a site are added, with the result being the hazard index (HI). An HI greater than 1 indicates that a toxic effect may result.

Risk concerns for the site stem from the VOCs and PCBs in the soil and the ground water. The VOC contamination is predominantly trichloroethene, tetrachloroethene, and toluene.

The tables on the following page summarize risk estimates for the site.

TABLE 1 SUMMARY OF GROUND WATER RISKS

Exposure Scenario	Non-Cancer Hazard Index (HI)	Cancer Risks (Excess Lifetime Cancer Risk-ELCR)
Current/Future Site Worker	0.0032	7.5 in 100,000,000 people
Current Adult Resident (living off-site)	0.011	6.8 in 10,000,000 people
Future Adult Resident (living on the Joy site and using site ground water)	34.1	4.6 in 1,000 people

TABLE 2 SUMMARY OF SURFACE WATER RISKS

Exposure Scenario	Non-Cancer Hazard Index (HI)	Cancer Risks (Excess Lifetime Cancer Risk-ELCR)
Future Adult Resident Swimming in the Tuscarawas River	0.0009	6 in 100,000,000 people
Future Adult Resident Eating Fish from the Tuscarawas River	0.002	5 in 1,000,000 people

TABLE 3 SUMMARY OF SURFACE SOIL RISKS

Exposure Scenario	Non-Cancer Hazard Index (HI)	Cancer Risks (Excess Lifetime Cancer Risk-ELCR)
Current/Future Site Worker	0.03	1 in 100,000 people
Future Adult On-Site Resident	0.02	6 in 100,000 people
Future Child On-Site Resident	0.04	4 in 100,000 people
Future Excavation Worker	0.01	1 in 1,000,000 people

An HI >1 indicates that a toxic effect may result from exposure.

The acceptable ELCR range is from 1 in one million to 1 in ten thousand. An ELCR of 1 in one million is considered the program goal.

Ecological Risk Assessment

The objective of the environmental risk assessment is to determine if constituents detected at the Joy facility have the potential to adversely affect the ecosystem at and/or surrounding the site.

The Ecological Risk Assessment concluded that both the potential terrestrial and aquatic ecosystem exposure, and the hazards associated with the constituents detected in media at the site, are considered to be low. The Joy facility is an operating facility surfaced mostly by gravel and asphalt, and therefore, is of limited value as wildlife habitat. The Ecological Risk Assessment showed that although constituents identified in ground water would discharge to the Tuscarawas River if the municipal wells shut down sometime in the future, dilution would reduce the concentrations to below water quality criteria, protective of the aquatic environment. Thus, adverse effects to the aquatic ecosystem of the Tuscarawas River are not expected. Therefore, clean-up goals for the site were based on protecting human health.

IV. DESCRIPTION OF ALTERNATIVES

The Feasibility Study (FS) was conducted to identify and screen technologies and alternatives for addressing the contamination problems at the site. The Risk Assessment indicated that there are current use and future use exposure pathways existing for the Joy site. The exposure pathways include ingestion and dermal contact with ground water, as well as incidental ingestion, dermal contact and vapor inhalation from soils.

Alternative 1

Five alternatives were evaluated in detail in the FS. The first alternative evaluated was the No-Action Alternative. This remedial alternative includes no remedial measures for the soil or ground water. Under this scenario it was assumed that the City wellfield and air stripper (which currently capture and treat the ground water contamination) would not be functioning. The No-Action Alternative was developed to serve as a baseline for evaluating the potential impacts associated with not implementing any remedial action, and for comparison with other alternatives that involve active remediation.

Each of the other four alternatives included at a minimum: institutional controls, soil vapor extraction and the continued operation of the City wellfield and air strippers. Soil vapor extraction and continued operation of the City wellfield and air strippers were used in all cases because these technologies have been identified by the U.S. EPA as technologies with substantial performance data that are most often selected as the remedy for soil and ground water VOC contamination. Using a remedial technology that has already been evaluated by the U.S. EPA is called a "presumptive remedy." Using a presumptive remedy is intended to save time, effort and money in the remedy selection process by using existing information for similar sites. The four alternatives that included remedial action incorporated various combinations of remedial technologies with the presumptive remedies

for the site.

The remedial alternatives are as follows:

TABLE 4 ALTERNATIVES TABLE

Alternative	Addressing Soils	Addressing Ground Water
1	-no action	-no action
2	-institutional controls -soil vapor extraction	-institutional controls -monitoring -containment & treatment by existing City wellfield and air stripper towers
3	-institutional controls -soil vapor extraction -PCB excavation & off-site disposal	-institutional controls -monitoring -containment & treatment by existing City wellfield and air stripper towers
4	-institutional controls -soil vapor extraction	-institutional controls -monitoring -containment & treatment by existing City wellfield and air stripper towers -plume extraction at main source areas on Joy property & treatment by air stripping
5	-institutional controls -soil vapor extraction	-institutional controls -monitoring -containment & treatment by existing City wellfield and air stripper towers -air sparging in main source areas on Joy property

Alternative 2

To address affected soils, this alternative would utilize institutional controls in the form of access restrictions and deed restrictions, in conjunction with soil vapor extraction. The institutional controls would only be in place until the soil clean-up goals are met. The soil vapor extraction system would be comprised of blowers, which would produce a vacuum. The blowers would be connected to vertical wells, acting as vapor inlets, that would be installed in each of the three areas of greater relative TCE concentrations and in the area of PCE contamination. In conjunction with routine monitoring, if necessary, air emissions

from the system would be addressed through a treatment measure (such as activated carbon absorption).

To address the contaminated ground water beneath Joy, a combination of institutional controls in the form of deed restrictions, routine periodic water quality and flow monitoring, and continued operation of the existing City wellfield and air stripper system would be utilized. Ground water monitoring would include the collection of water level elevation data and ground water samples from selected monitoring wells, including wells located within and immediately downgradient from the area of soil that contains PCBs. Water level elevation data would be used to document the degree of containment achieved by the operation of the wellfield.

It is estimated that Remedial Alternative 2 would achieve MCLs in the alluvial aquifer beneath the site in 12-14 years.

Estimated Capital Cost: \$ 750,000

Estimated Annual Operations and Maintenance Cost:

(years 1-5 with soil vapor extraction) \$ 110,000
(years 6-30 without soil vapor extraction*) \$ 55,000

**An operating period of 30 years has been utilized for the City wellfield air strippers because it is anticipated that the stripper towers may need to continue to operate to ensure that water being distributed to the City continues to meet MCLs during potential periods of variation in ground water quality.*

Estimated Present Worth Cost**: \$ 1,500,000

***The present worth cost is a relating of costs that occur over different time periods to present costs by discounting all future costs to present value. This allows the cost of remedial alternatives to be compared on the basis of a single figure that represents the capital required in current dollars to construct, operate, and maintain the remedial alternative throughout its planned life.*

Alternative 3

This remedial alternative would address soil contamination with institutional controls and soil vapor extraction, implemented as described in remedial alternative 2. In addition to these measures, prior to installation and operation of the soil vapor extraction system, excavation would be used to remove an estimated 600 cubic yards of soil containing PCB concentrations above the soil goal. The excavated soils would be disposed of off-site.

Because there are currently monitoring wells located within the area that would require excavation under this remedy, the affected monitoring wells would be abandoned prior to the excavation of soil. Following backfilling of the excavated area two new monitoring wells would be installed to replace the abandoned wells.

To address Joy's ground water contamination this remedy would use the combination of institutional controls, routine periodic water quality and flow monitoring, and continued operation of the existing City wellfield and air stripper system, as is detailed above for remedy 2.

It is estimated that Remedial Alternative 3 would achieve MCLs in the alluvial aquifer beneath the site in 12-14 years.

Estimated Capital Cost: \$ 1,100,000

Estimated Annual O&M Cost:

(years 1-5 with soil vapor extraction) \$ 110,000

(years 6-30 without soil vapor extraction) \$ 55,000

Estimated Present Worth Cost: \$ 1,900,000

Alternative 4

Remedial Alternative 4 would address the soil contamination at Joy as described in Remedial Alternative 2 using institutional controls and soil vapor extraction.

The ground water contamination beneath Joy would also be addressed by ground water monitoring and by the operation of the existing City wellfield and air strippers as described in Remedial Alternative 2. However in addition to these measures for ground water, plume extraction and treatment at the main source areas on Joy property would be implemented. The plume extraction component of the remedy would have pumping wells installed in the two areas of greater relative TCE contamination. The pumping wells would be used to remove ground water with relatively high concentrations of VOCs prior to its migration downgradient. The extracted ground water would be piped into an air stripper for VOC removal.

It is estimated that Remedial Alternative 4 would achieve MCLs in the alluvial aquifer beneath the site in 10-12 years.

Estimated Capital Cost: \$ 1,100,000

Estimated Annual O&M Cost:

(years 1-5 with soil vapor extraction, plume extraction & air stripping) \$ 140,000

(years 6-12 without soil vapor extraction)	\$ 91,000
(years 13-30 without plume extraction & air stripping)	\$ 55,000

Estimated Present Worth: \$ 2,100,000

Alternative 5

Remedial Alternative 5 would address the soil contamination at Joy as described in Remedial Alternative 2 using institutional controls and soil vapor extraction.

The ground water contamination beneath Joy would also be addressed by ground water monitoring and by the operation of the existing City wellfield and air strippers as described in Remedial Alternative 2. However in addition to these measures for ground water, air sparging would be done. Air sparging is a process where air is forced into the zone below the contaminated aquifer through small diameter injection wells. After the air is injected, it migrates upward stripping VOCs from the ground water as it passes through the aquifer. As the VOC vapors reach the unsaturated soil zone, they are removed by the soil vapor extraction system. If implemented, air sparging would be conducted for the two plume sources of TCE which have the greatest relative concentrations.

It is estimated that Remedial Alternative 5 would achieve MCLs in the alluvial aquifer beneath the site in 10-12 years.

Estimated Capital Cost: \$ 820,000

Estimated Annual O&M Cost:

(years 1-5 with soil vapor extraction & air sparging)	\$130,000
(years 6-12 without soil vapor extraction)	\$ 55,000
(years 13-30 without air sparging)	\$ 65,000

Estimated Present Worth Cost: \$ 1,700,000

V. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting the remedial alternative for the Joy site, Ohio EPA considered the following eight criteria.

1. **Overall protection of human health and the environment** - addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, and/or institutional controls.
2. **Compliance with all State and Federal laws and regulations** - addresses whether or not a remedy will meet all of the applicable State and Federal

whether or not a remedy will meet all of the applicable State and Federal environmental statutes.

3. **Long-term effectiveness and permanence** - refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up goals have been met.
4. **Reduction of toxicity, mobility, or volume** - is the anticipated performance of the treatment technologies to yield a permanent solution. This includes the ability of the selected alternative to reduce the toxic characteristics of the chemicals of concern or remove the quantities of those chemicals to an acceptable risk concentration or regulatory limit and/or decrease the ability of the contaminants to migrate through the environment.
5. **Short-term effectiveness** - involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until clean-up goals are achieved.
6. **Implementability** - is the technical and administrative feasibility of a remedy, including the availability of goods and services needed to implement the chosen solution.
7. **Cost** - includes capital and operation and maintenance costs.
8. **Community acceptance** - was assessed based on review of the public comments received on the Preferred Plan.

The Ohio EPA's selected alternative for the Joy site is Remedial Alternative 2 with additional monitoring. This selected alternative consists of soil vapor extraction, and City wellfield pumping for plume containment and treatment by air stripping. These remedial measures would be augmented by institutional controls, confirmation sampling, and monitoring. Ohio EPA believes that this alternative will best satisfy criteria one through eight listed above.

Overall Protection of Human Health and the Environment

This preferred remedy would provide overall protection of human health and the environment. Current and potential future exposure pathways at the Joy site include direct contact and ingestion of soil or ground water. Soil vapor extraction is expected to reduce the concentrations of VOCs in the soils to levels that meet the risk based clean-up levels. Use of soil vapor extraction would also reduce the amount of VOCs that are currently able to leach into the ground water. Pumping of the City wellfield to contain and capture the ground water plume would protect the environment by effectively limiting the extent of

migration of the plume to the wellfield's cone of influence. Air stripper treatment of the pumped ground water at the City wellfield would protect human health by removing the VOC concentrations which are above the MCL in the public drinking water supply.

This remedial alternative would achieve the chemical specific applicable or relevant and appropriate requirements for ground water through soil vapor extraction removing VOCs from the soils, substantially reducing the extent to which additional impacts to ground water could occur, while continued operation of the City wellfield would continue to remove contaminant mass from the alluvial aquifer.

Compliance With All State and Federal Laws and Regulations

This remedial alternative would achieve chemical-specific criteria for air emissions at the City air strippers since emissions treatment currently is not required for the City air strippers due to the low levels of VOCs emitted. If air emissions from the soil vapor extraction systems exceed air standards, the emissions would be controlled through a treatment such as granular activated carbon.

Long-term Effectiveness and Permanence

In order to be fully protective in the long term, this remedy would require the use of deed restrictions on the property prohibiting its use for residential purposes and precluding the use of the ground water beneath the site until clean-up levels are attained. Deed restrictions prohibiting ground water use would be an additional protection to the City of New Philadelphia's ordinance which currently prohibits the installation of private water wells.

Deed restrictions prohibiting residential use are especially important because this remedy would leave PCB soils in place, resulting in PCB concentrations that present a potential risk of 1 excess lifetime cancer in 100,000 people, under industrial conditions. This level is considered to be within the U.S. EPA range of acceptable risk. However, with the current level of PCBs in the soils, any future resident that would live on the grounds of the site would be subject to a greater risk than the industrial worker, such a risk level would potentially exceed an acceptable level of risk. Although deed restrictions can be defined as being legally permanent, the long term effectiveness is limited to the extent that the restrictions continue to be monitored to ensure their enforcement.

Once soil vapor extraction has reduced the levels of VOCs in the soils to the selected clean-up goal, the reduction of VOCs in the soil will be effective for the long term and permanent. Once pumping at the City wellfield has removed VOC concentrations in the ground water to meet the clean-up goals, the effects will be permanent in the long term with the combination of the soil vapor extraction having removed the source of further VOC contamination of the ground water.

Reduction of Toxicity, Mobility, or Volume

If implemented, this selected alternative would reduce the toxicity, mobility, and the volume of contamination through treatment. During soil vapor extraction, if necessary in order to meet state and federal air regulations, the VOCs would be collected by a technique such as granulated activated carbon. If granulated activated carbon is used, when the carbon is regenerated, the VOCs would be thermally destroyed thereby reducing the volume of contamination. The result of soil vapor extraction would be soil that is less toxic and VOCs that are no longer mobile to move into the ground water. Soil vapor extraction would also indirectly affect the mobility of the PCBs present in the soil. PCBs tend to be more mobile in the presence of solvents such as TCE and PCE. By removing the VOCs with soil vapor extraction, the PCB mobility will be reduced.

Short-term Effectiveness

In the short term, this selected alternative would provide protection to human health with the use of the air strippers at the City wellfield. Treatment by the air stripper insures that the VOC levels in the public drinking water are at or below drinking water standards. The continued pumping of the City wellfield at a 2.75 MGD average would provide the environment with short term protection by capturing the contaminant plume and preventing it from migrating into the uncontaminated areas of the aquifer. In order to ensure that the short-term effectiveness would be maintained, Joy would be required to put a legal agreement in place with the City that would provide Joy with the legal grounds to be able to ensure the necessary wellfield pumping. Deed restrictions would provide protection by preventing use of ground water beneath the site and by reducing exposure to the soil containing PCBs.

Implementability

It is anticipated that implementing the selected alternative would be both technically and administratively feasible. From a technical standpoint, the technologies that will be employed are soil vapor extraction, City wellfield pumping and air stripping. Soil vapor extraction is a proven technology. The geology at the site appears to offer ideal conditions for effective use of soil vapor extraction. The City wellfield and air stripping are currently in effective operation with no technical implementability problems. Implementability of the selected remedy is also expected to be administratively feasible. Administratively, the use of soil vapor extraction should not cause substantial disruptions of facility operations. Administration of the pumping at the City wellfield and the air stripping is currently facilitated through a legal agreement between the City and Joy. Use restrictions that would be part of the selected alternative to the site should be administratively feasible through the implementation of deed restrictions. Furthermore, it is expected that any permits or permit waivers necessary for the implementation of the remedy will be obtainable on the administrative level. The goods and services necessary to implement

the remedy are expected to be readily available.

Cost

The cost of the selected alternative is less than the costs of the other site alternatives, except no-action, based on present worth costs.

Soil vapor extraction, City wellfield pumping, air stripping, institutional controls, confirmation sampling, and monitoring have been selected as the alternative for the site because Ohio EPA believes that this combination of remedial measures best satisfies the seven evaluation criteria. The alternatives, number 4 and 5, which include air sparging or additional pump and treat, are predicted to meet the site clean-up goals two years sooner. Although the time for achieving clean-up under these remedies is shorter, the additional cost that allows the clean-up to occur more rapidly is significant. Ohio EPA has selected Alternative 2 with additional monitoring as the alternative because Ohio EPA believes that this alternative will meet the clean-up goals and although it is estimated to take two more years to do so, it is not justifiable to increase the cost greatly in exchange for marginally decreasing the clean-up time.

TABLE 5 REMEDY TIME AND COST

Remedy	Time to Achieve Clean-up	Present Worth Cost
Selected Alternative	12-14 years	\$ 1,500,000
Alternative Including Source Extraction	10-12 years	\$ 2,100,000
Alternative Including Air Sparging	10-12 years	\$ 1,700,000

The selected alternative would address the PCBs at the site by using additional sampling, monitoring, access controls and putting in place deed restrictions on ground water and on residential use of the site. As outlined in the Feasibility Study, the other way to address the PCBs is excavation. Through excavation, future risk would be reduced to levels that meet clean-up goals for future hypothetical on-site residential use. However, excavation of this area could require special engineering controls to avoid possible damage to the adjacent structures. Without excavation, the soil concentrations are within the risk range for industrial use; however, they exceed the accepted risk range for future on-site residential use. The present worth cost of alternative 3, which includes PCB excavation and their off-site disposal, is \$1,900,000. This is \$400,000 more than the cost of the selected alternative. Ohio EPA has selected an alternative which addresses PCBs by meeting the industrial use risk ranges rather than meeting residential use. Ohio EPA

believes that meeting the hypothetical future on-site residential use goal is not practicable, considering the eight criteria above, including cost.

Community Acceptance

Community acceptance was assessed based on the review of public comments received on the Preferred Plan. Attachment A of this document contains the Responsiveness Summary, which is Ohio EPA's response to the comments received during the Preferred Plan public comment period. Some changes suggested on the Preferred Plan were incorporated into this Decision Document.

VI. SELECTED REMEDY

As a part of the remediation for the site, institutional controls would be utilized. Deed restrictions would be placed on the Joy site's property deed to prohibit installation of ground water wells (other than for monitoring purposes), prohibit use of the ground water beneath the site until clean-up levels (see Table 6) are reached, restrict use of the property to industrial use, and prohibit unauthorized digging and excavation in the area formerly used for PCB storage.

The institutional controls in the form of access restrictions would be utilized in areas of VOC soil contamination and in the area of PCB soil contamination. Access restrictions for the areas of VOC contamination would remain in place until risk based VOC clean-up goals are met (see Table 7). Access restrictions in the PCB area could not be lifted, unless at a future time some remedial action is taken to remove the soil contaminated with PCBs (see Table 7).

The soil vapor extraction system would be installed in each of the three areas of greater relative TCE concentrations and in the area of PCE contamination. If air emissions from the soil vapor extraction system would exceed the air regulation standards, treatment would be required. If necessary a treatment method, such as activated carbon absorption, would be used in conjunction with routine monitoring to ensure that air standards are not exceeded. The soil vapor extraction system would be operated until sampling indicates that the leach based soil clean-up goals that are protective of ground water (see Table 8) have been met or Ohio EPA determines that soil vapor removal has reached an asymptotic level. For the purpose of this remedy, an asymptotic level would be defined as a point where the soil vapor extraction system's removal of VOCs is occurring at a level so low that continued operation is not effective in achieving mass reduction of the VOC source, such that the costs of soil vapor extraction operation far exceed the benefit to the environment. Should monitoring data appear to indicate that an asymptotic soil vapor removal rate has been reached, Ohio EPA would consider the data available. In the event that Ohio EPA would reevaluate the remedy for the site soils, a contingent measure such as containment would be considered in order to augment the remedy.

To address the contaminated ground water beneath Joy property, operation of the existing City wellfield and air stripper system would continue until ground water contamination

levels are consistently below the ground water clean-up goals found in Table 6. To implement this remedy Joy must obtain a legally binding agreement with the City of New Philadelphia that is acceptable with the Ohio EPA. The purpose of Joy's legal agreement with the City would be to ensure that the portion of the remedy, which relies on the use of the City wells and treatment system, would remain in place. The legal agreement between Joy and the City must include provisions for operation and maintenance of the stripper towers, wellfield pumping rate, and monitoring. The legal agreement must also ensure that future operations of the wellfield remain consistent with the remedy. The pumping of the City wellfield would be used to contain and remediate the ground water plumes. Routine periodic water quality monitoring would be done to ensure that VOCs in the drinking water do not exceed the drinking water quality standards. In order to determine the pumping rate necessary for plume containment, ground water monitoring would be done on a regular basis. Monitoring would include the collection of water level elevation data and ground water samples from selected monitoring wells. Complete capture of the ground water plume from Joy must be achieved. Joy will be required to document on a regular basis the extent of the ground water plume. Documentation of the plume migration can be done using water level elevation data.

Pumping of the wellfield and the use of soil vapor extraction is expected to remediate the site within 12-14 years. At the fifth year of the remedy implementation, progress in meeting the clean-up goals would be evaluated. Should the data at the time show that clean-up goals are unlikely to be met within the next seven to nine years, additional remedial measures to allow the clean-up to be achieved more quickly would be considered.

Additional soil sampling and ground water sampling are to be done in the immediate area and the area directly down-gradient of where the PCBs were detected in the soil and ground water to delineate the area to be subject to deed restrictions. Deed restrictions will be used to ensure that soil in the PCB area is not disturbed and to preclude use of the area for non-industrial purposes. Deed restrictions against disturbing soil in the PCB area are intended to keep soil exposure, for the industrial workers, limited to surface soil.

TABLE 6

RISK BASED LEVELS AND CLEAN-UP GOALS FOR GROUND WATER

Carcinogens	Ground Water Concentration *	10 ⁻⁶ Risk Based Concentration	MCL	Clean-up Goals
Arsenic	0.003	0.0000069	0.05	0.05
1,1-Dichloroethene	0.039	0.0000023	0.007	0.007
Di (2-eththylhexyl)Phthalate	0.007	0.00079	0.006	0.006
PCBs	0.0013	0.0000006	0.0005	0.0005
Tetrachloroethene	0.32	0.00012	0.005	0.005
Trichloroethene	4.7	0.00033	0.005	0.005
Vinyl Chloride	0.0018	0.000004	0.002	0.002

Non-Carcinogens	Ground Water Concentration *	Concentrations Cumulatively Yielding an HI=1	MCL	Clean-up Goals
Copper	0.056	0.23	1.3	0.23
Cyanide	0.0119	0.12	0.2	0.12
Di-n-butyl phthalate	0.008	0.57	NA	0.57
Fluoride	0.8	2.2**	4.0	2.2
1,1-Dichloroethane	0.091	0.16	NA	0.16
1,2-Dichloroethene	0.72	0.054	0.07	0.054
1,1,1-Trichloroethane	0.19	0.25	0.2	0.2

Source: Feasibility Study Report for Joy Technologies, Inc., December 1995

All Concentrations reported in mg/L.

* - Based on 95% upper confidence level (UCL) concentration in ground water from the baseline risk assessment.

** - Not cumulative with other constituents; dissimilar toxic endpoints.

NA = Not Available

TABLE 7

RISK BASED CLEAN-UP GOALS FOR SOIL

Carcinogens	Soil Concentration *	Industrial Use (Excavation Worker)	Industrial Use (Site Worker)	Hypothetical On-Site Residential Use
		10 ⁻⁶ Risk Level	10 ⁻⁶ Risk Level	10 ⁻⁶ Risk Level
Benzene	0.0077	12	0.29	0.038
Methylene Chloride	0.15	37	1.0	0.13
PCBs (surficial soil 0'-2')	1.1	4.6	0.50**	0.05
Tetrachloroethene	1.3	84	1.7	0.4
Trichloroethene	4.8	38	1.0	0.13

		Soil Concentrations Cumulatively Yielding an HI = 1		
Non-Carcinogens	Soil Concentration	Industrial Use (Excavation Worker)	Industrial Use (Site Worker)	Hypothetical On-Site Residential Use
Acetone	0.085	13,000	28,000	320
2-Butanone	0.034	380	1,100	40
Carbon Disulfide	0.0078	4.2	12	0.56
1,2-Dichloroethene	0.3	120	250	30
4-Methyl-2-Pentanone	0.34	2,600	6,700	44
Toluene	0.17	670	1,900	17

Adapted from: Feasibility Study Report for Joy Technologies, Inc., December 1995

Clean-up Goals Indicated in **Bold Print**

All Concentrations reported in mg/kg.

* - Based on 95% upper confidence level (UCL) concentration in soil from the baseline risk assessment

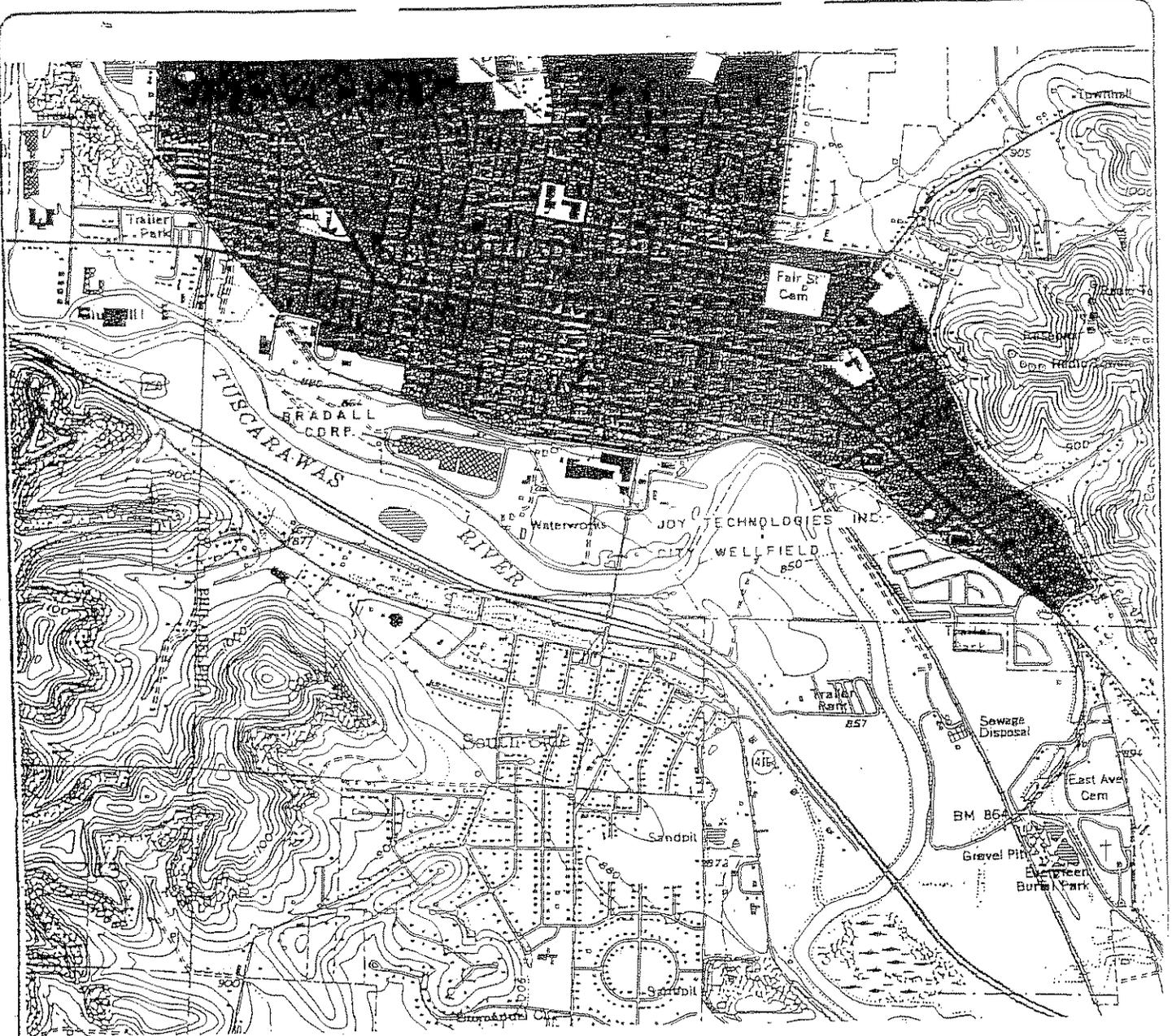
** - As stated in the text, PCBs left in place in surface soils at the site would meet an industrial risk level of 10⁻⁶; furthermore, deed and access restrictions pertaining to the PCB area are to be maintained on the property.

TABLE 8

LEACH BASED SOIL CLEAN-UP GOALS
 CONSIDERED PROTECTIVE OF GROUND WATER

Constituent	Soil Clean-up Goal (ppm)
1,1-Dichloroethene	0.20
1,2-Dichloroethane	2.45
1,1,1-Trichloroethane	26.3
Tetrachloroethene	0.76
Trichloroethene	0.45

Source: Feasibility Study Report for Joy Technologies, Inc., December 1



SCALE



CONTOUR INTERVAL 20 FEET



QUADRANGLE LOCATION

(SOURCE: NEW PHILADELPHIA, OHIO 7.5' U.S.G.S. QUADRANGLE, 1985)

<p>SCALE SHOWN</p>	<p>DRAWING NO. A 1024940</p>	<p>PLANT LOCATION AND TOPOGRAPHIC SETTING JOY TECHNOLOGIES INC.</p>	<p>FIGURE 1</p>	
 <p>HydroSystems Management, Inc. <small>Leadership in Consulting Services</small></p>	<p>DRAWN BY: PARADISE CAD SJP CHECKED BY: DATE</p>		<p>DATE: 10/24/94</p>	
	<p>APPROVED BY: DATE</p>		<p>NEW PHILADELPHIA</p>	<p>OHIO</p>

QUAL VERIFICATION
THIS PLAN REPRESENTS THE FIELD DATA AND IS NOT TO BE USED FOR REPRODUCTION SCALE

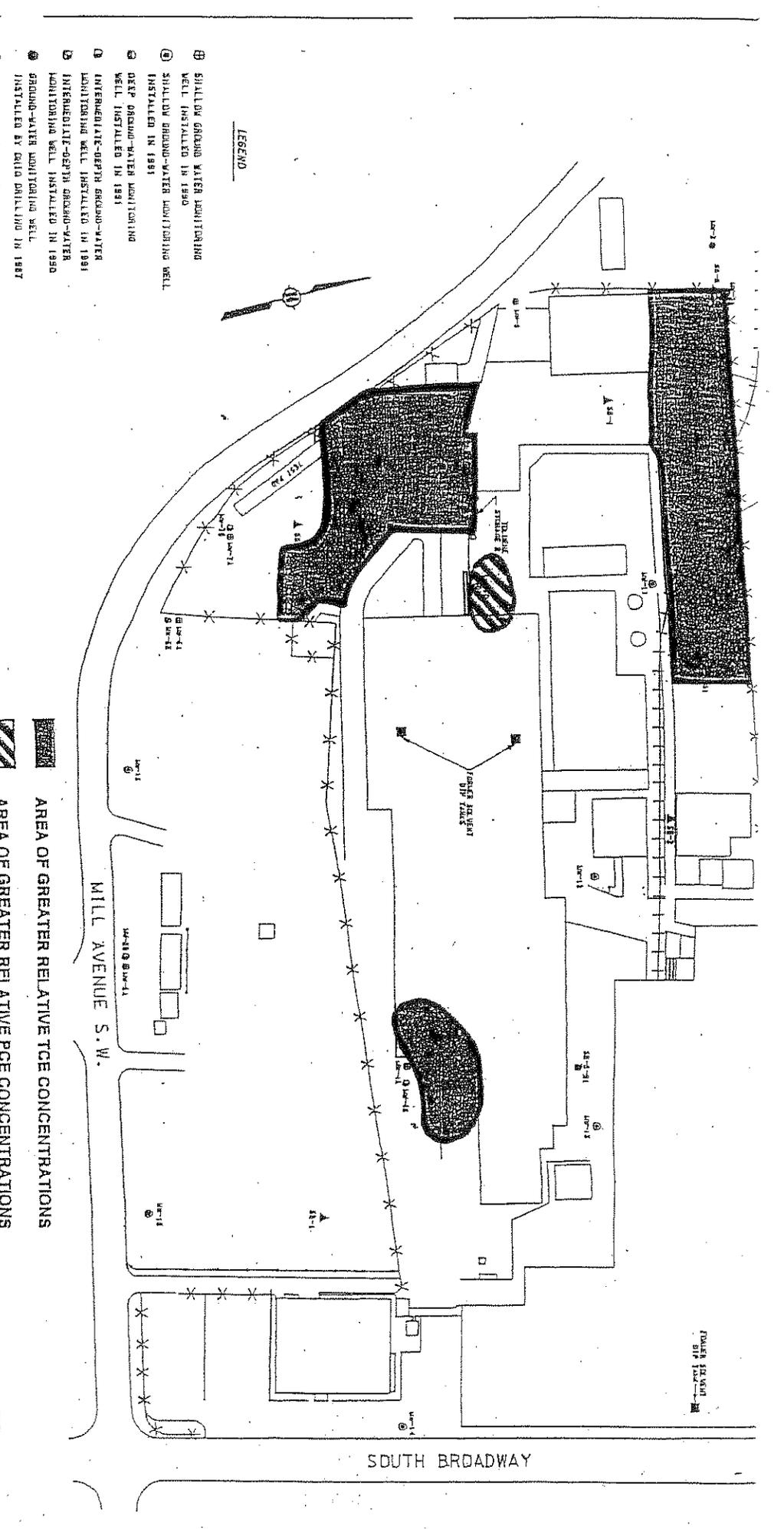
DESIGNED BY	PROJECT NO.	DATE
DRAWN BY	NO.	
CHECKED BY		
APPROVED BY		
DATE		

GENERAL SITE BASE MAP
JOY TECHNOLOGIES INC.
NEW PHILADELPHIA, OHIO

FIGURE 2

- LEGEND**
- ① SHALLOW GROUND WATER MONITORING WELL INSTALLED IN 1990
 - ② SHALLOW GROUND-WATER MONITORING WELL INSTALLED IN 1991
 - ③ DEEP GROUND-WATER MONITORING WELL INSTALLED IN 1991
 - ④ INTERMEDIATE-DEPTH GROUND-WATER MONITORING WELL INSTALLED IN 1991
 - ⑤ INTERMEDIATE-DEPTH GROUND-WATER MONITORING WELL INSTALLED IN 1990
 - ⑥ GROUND-WATER MONITORING WELL INSTALLED BY CECO DRILLING IN 1987
 - A SHALLOW SOIL BORING LOCATION, 1990
 - M SHALLOW SOIL BORING LOCATION, 1991

-  AREA OF GREATER RELATIVE TCE CONCENTRATIONS
-  AREA OF GREATER RELATIVE PCE CONCENTRATIONS



Attachment A

Ohio Environmental Protection Agency's

Responsiveness Summary
for the

Joy Mining Machinery Site
(the former Joy Technologies Inc. Site)
New Philadelphia, Ohio

Responsiveness Summary

This Responsiveness Summary has been prepared to address each of the comments submitted in written form on the Preferred Plan for remedial action. No oral comments were made during the public hearing on the Preferred Plan.

Comment from an Anonymous Citizen

There was one comment received which expressed concern about the cancer rates in Tuscarawas County and concern that using the stripper towers in the remedy would not fully address the carcinogenic risks.

Ohio EPA Response: A risk assessment for both carcinogens and non-carcinogens was done as a part of the Remedial Investigation Report. The remedy being recommended by Ohio EPA includes soil vapor extraction for the purpose of removing the source of the contamination from the soil so that it will not continue to move into the ground water. Contamination that will be removed includes carcinogenic compounds. Both the soil vapor extraction system and the air stripper towers at the City wellfield will be required have their air emissions meet state and federal standards. If necessary the emissions will undergo treatment in order to meet the standards.

Comments from Joy Technologies Inc.

Page 3, Section III, Paragraph 4 For purposes of clarification, it is suggested that the second sentence of this paragraph be changed to read as follows:

"Because the level of TCE in water from the New Philadelphia municipal supply wells was above the newly promulgated MCL, the City installed two air stripper towers at the wellfield to reduce the VOCs in the water to meet the new MCLs before distributing it for drinking."

The first change will clarify that VOC levels in water pumped by the municipal wellfield were not out of compliance with any promulgated regulatory limit for TCE prior to the 1987, when the MCL for TCE was established at 5 ug/L. The second suggested change makes the sentence factually correct, while eliminating the implication that prior to operation of the stripper towers the VOC levels in the water supplied by the wellfield were unsafe. As an aside, we note for the record that the United States Environmental

Protection Agency ("USEPA") is in the course of re-evaluating the carcinogenic effects of a variety of chemicals, including TCE, which could lead to an increase in the allowable levels of TCE in drinking water.

Ohio EPA Response: The suggested clarification has been made in the Decision Document.

Page 5, Section IV.1. Ground Water, Paragraph 1 *The next to the last sentence of this paragraph states that three monitoring wells existed at the site prior to the RI Report. Actually, in light of the way the site is and has been defined throughout the process, a total of nine monitoring wells existed prior to the RI Report. Six wells were installed by Ohio Drilling in the wellfield, and three wells were installed on or immediately adjacent to Joy property. This clarification provides a more accurate indication of the level of data collection that was conducted prior to Joy undertaking the RI Report.*

Ohio EPA Response: In order to be consistent with Section 1 of the Joy Technologies Feasibility Study Report (FS), the Decision Document uses the phrase "Joy property" in place of the word "site" which was used in the Preferred Plan. The Decision Document will also incorporate additional language about the 6 monitoring wells at the wellfield to clarify that nine monitoring wells existed prior to the RI Report.

This paragraph also indicates that containment of the VOC plume is maintained as long as the City wellfield operates at a very specific pumping rate. Although Joy recognizes this point, Joy adds that several factors contribute to the degree of containment that is achieved at any given time, including the wellfield pumping rate, the pool elevation of the Tuscarawas River adjacent to the site, and recent precipitation patterns. During the course of the remedial program, containment of the plume should be evaluated based on periodic, direct monitoring of water-level elevations at key monitoring points. Based on water-level data, the operation of the wellfield can be modified, if needed, to maintain plume containment. Evaluating containment based on direct monitoring of water-levels could avoid unnecessary modifications to the City's normal wellfield operations, if such decisions were based solely on monitoring of the wellfield pumping rate.

Ohio EPA Response: Wording in the corresponding section in the Decision Document has been modified using language from Section 2.5.3.4 of the FS. The description of the Decision Document's selected remedy, will allow the option of containment based on monitoring to be incorporated in the remedial design phase.

Page 9, Section IV.2. Risk Assessment, Summary of Risks Table - Surface Soil Section *The Current Adult Resident (living off-site) portion of the table should be*

deleted. This exposure scenario should not include surface soil. It appears that this entry was repeated inadvertently from the Ground Water section of the table.

Ohio EPA Response: This table has been revised in the Decision Document.

Page 10, Section IV.3. Feasibility Study, Paragraph 2 The Ohio EPA includes in this section a discussion and description of the use of "presumptive remedies" in evaluating potential remedial alternatives at the site. Joy commends the agency for its evaluation of "presumptive remedies" in the context of this site, inasmuch as the presumptive remedy utilizes extensive existing data and experience gathered from similar sites by the USEPA, thereby reducing the costs of evaluation and enhancing the likelihood of effective implementation of the remedy at the Joy site.

Ohio EPA Response: Ohio EPA agrees that Presumptive Remedies are both efficient and effective.

Page 11, Section IV.3. Feasibility Study, last sentence The Preferred Plan states conclusively that air emissions from the SVE system(s) will be treated using activated carbon. For purposes of the Feasibility Study, the treatment of air emissions using activated carbon was assumed. However, the actual need for and type of emissions treatment will be determined through pilot testing. Therefore, the Preferred Plan should reference that air emissions from the SVE system(s) will be treated if required under state law and as determined by pilot testing.

Ohio EPA Response: The discussion of the SVE emissions in the Decision Document has been written to take into account that emissions treatment will be based on compliance with air regulations.

Page 11, Section IV.3. Feasibility Study, Italicized text following Estimated Annual Operation and Maintenance Cost The language after the asterisk utilizes the working assumption that the City wellfield air strippers will be operated for a period of 30 years. It is anticipated that as long as VOCs are being detected at levels near their respective MCLs, it will be in the best interest of the City and Joy to continue operating the air strippers. However, the Preferred Plan should reflect the ability to terminate operation of the air strippers if VOC concentrations in the pumped ground water drop to levels that are consistently below detection or below MCLs.

Ohio EPA Response: As was done in the FS, a period of 30 years was used for estimation purposes. Page 18 of the Preferred Plan did state that the air strippers would continue until ground water contamination levels are consistently below the ground water clean-up goals. The Decision Document also bases termination of the stripper towers on clean-up goals and not time periods.

Page 14, Section V., Second Full Paragraph The Ohio EPA's preferred alternative is identified as "Remedial Alternative 2 with additional monitoring." Except for the No Action alternative, all of the remedial alternatives evaluated in the Feasibility Study included

monitoring. Clarification of what is meant by "additional monitoring" is needed. Also, the Preferred Plan should clarify that "confirmation sampling" refers to soil sampling that would be conducted to confirm residual VOC concentrations in soil following termination of SVE.

Ohio EPA Response: Page 14 of the Preferred Plan was the very general description of Ohio EPA's preferred remediation plan for the site. A more detailed outline of the remediation plan followed, beginning on page 17 of the Preferred Plan. The specifics regarding monitoring and confirmational sampling will be addressed in the RD/RA phase of the project.

Page 15, Section V, Compliance With All State and Federal Laws and Regulations

The Preferred Plan states conclusively that air emissions from the SVE system(s) will be treated using activated carbon. For purposes of the Feasibility Study, treatment of air emissions using activated carbon was assumed. However, the actual need for and type of emissions treatment will be determined through pilot testing. Therefore, the Preferred Plan should acknowledge that air emissions from the SVE system(s) will be treated if required by state law and as determined by pilot testing.

Ohio EPA Response: The discussion of the SVE emissions in the Decision Document has been written to take into account that emissions treatment will be based on compliance with air regulations.

Page 18, Section V, Paragraph 2 *The Preferred Remedy states that the soil vapor extraction system would be operated until sampling indicates that the leach-based soil clean-up goals that are protective of ground water have been met or "Ohio EPA determines that soil vapor removal has reached an asymptotic level."*

The description of conditions under which the VOC removal by the SVE system(s) would be considered to have reached an asymptotic level is not entirely consistent with that presented in the FS. The Preferred Plan indicates that an asymptotic level would be defined as a point where the rate of VOC removal is "so low that continued operation is resulting in virtually no mass reduction in the VOC source." This description could require operation of the SVE system(s) until the VOC mass removal rate is essentially zero. This is a highly unrealistic goal and does not reflect discussions set forth in the FS. Section 4.3.1.1 of the FS states, "Such a determination could be based on a point when the VOC mass removal achieved by the SVE systems reaches an asymptotic level, indicating that the cost of continued reduction of VOC mass in the soil outweighs the benefits." Joy believes that the FS appropriately incorporates a cost-benefit analysis into the evaluation of potential asymptotic levels of VOC mass removal which would not require that VOC mass removal levels reach essentially zero before an asymptotic condition would be considered to exist. Joy recommends that this section of the Preferred Plan be revised to reflect the approach in the approved FS.

Ohio EPA Response: Ohio EPA believes that this section of the Preferred Plan does reflect the approach used in the FS. The Preferred Plan does incorporate cost-benefit analysis when it states "such that the costs of soil vapor extraction operation far exceed the benefit to the environment." This section in the Preferred Plan was not intended to imply a goal of SVE operation until the mass removal rate is essentially zero. In order to avoid a similar misunderstanding in the corresponding section of the Decision Document, the wording has been modified.

Page 18, Section V, Paragraph 4 *The Preferred Plan states that after the fifth year of remedy implementation, the potential need for supplemental remedial measures would be based on a determination of whether clean-up goals are likely to be met within a specific, additional time frame (i.e., seven to nine years). As discussed repeatedly in the FS (e.g., Section 4.3.3.1), projections of specific clean-up time frames, especially with regard to ground water, should be regarded with a high level of uncertainty. Therefore, determining the need for further remedial measures based on whether clean-up goals can be met in an additional seven to nine years represents a very narrow view, is likely to be susceptible to significant error, and could result in substantial additional cost without appreciable or reliably predictable reduction in clean-up time. Instead, the status of the remedial program after the first five years should be based on an evaluation of three factors:*

- 1) *Is the remedy effective in protecting human health and the environment and is the protection likely to be maintained in the future?*
- 2) *Do available monitoring data indicate reasonable progress is being made in remediating soil and ground water?*
- 3) *Would potential modifications to the remedial program be cost-effective and would such modifications be likely to significantly and reliably reduce the remediation time?*

Joy recommends that the Decision Document reflect this approach.

Ohio EPA Response: Ohio EPA chose Remedial Alternative 2 as the Preferred Plan for remediating the site based on the seven evaluation criteria which include cost and time considerations. Other alternatives available to the Ohio EPA were estimated to achieve clean-up in 2 years less time than the chosen alternative; however, their cost was greater. Ohio EPA believed that with the added cost, Ohio EPA could not justify decreasing the clean-up time by 2 years. However, if the assumptions upon which the remedy decisions were based prove to be inaccurate once the remedy has been under way for 5 years then it would be reasonable to reconsider whether added cost and more timely measures are justifiable. Evaluation of the progress of the remedy implementation after 5 years, is consistent with the CERCLA requirement of a 5 year review. Evaluation criteria such as those listed in the above comment can be proposed during the Remedial

Design.

Page 18, Section V, Paragraph 5 The Preferred Plan indicates the use of deed restrictions to address PCBs in soil is contingent upon the results of further soil and ground water sampling. During the Remedial Investigation, a total of 20 soil samples were collected from eight locations and analyzed for PCBs. In addition, during the Phase I RI, 13 monitoring wells were sampled and analyzed for PCBs. During Additional Work conducted in May 1993, the only well where PCBs were detected during Phase I (MW-3A) was again sampled for PCBs (the results indicated PCB concentrations to be approximately one half the MCL). To ensure that the resulting data satisfied project objectives, the scope of these sampling activities was developed through joint discussions between the Ohio EPA and Joy and was based on historical knowledge of plant operations/practices potentially involving PCBs. These data were subsequently used to characterize site conditions in the RI and the FS, and to evaluate potential site risks in the Risk Assessment. The interpretations and conclusions contained in these documents were deemed satisfactory to the Ohio EPA by its approval of the documents. In light of this, it is unclear why final selection of that aspect of the remedy addressing PCBs in soil is now being made contingent upon yet further soil and ground water sampling. Joy feels that if the available PCB data were considered adequate for all other purposes during the RI/FS process, then further sampling and analysis is not necessary to confirm that deed restrictions are an appropriate remedy to address PCBs in soil.

Ohio EPA Response: The decision document has been revised to more accurately reflect the purpose of the sampling.

APPENDIX B

STATE OF OHIO STATEMENT OF WORK FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION AT

The Former Joy Mining Machinery and Current Howden Buffalo Inc. Site
New Philadelphia, Tuscarawas County, Ohio

1.0 PURPOSE

The purpose of this Remedial Design/Remedial Action Statement of Work (RD/RA SOW) is to define the procedures the Respondents shall follow in designing and implementing the selected remedy for the former Joy Mining Machinery and current Howden Buffalo Inc. Site as described in this SOW and the Director's Final Findings and Orders (Orders) to which it is attached. The Division of Emergency and Remedial Response (DERR) documented the selection of a remedy for the site in a Decision Document dated February 2000. The intent of the remedy is to protect the public health and/or the environment from the actual or potential adverse effects of the contaminants discovered at and related to the site. Further guidance for performing the RD/RA work tasks may be found in the U.S. EPA Superfund Remedial Design and Remedial Action Guidance document (OSWER Directive 9355.0-4A). All applicable regulatory requirements pertaining to the selected remedy and RD/RA activities shall be followed.

The Ohio EPA shall provide oversight of the Respondents' activities throughout the RD/RA. The Respondents shall support the Ohio EPA's initiatives and conduct of activities related to the implementation of oversight activities.

2.0 DESCRIPTION OF THE REMEDIAL ACTION/ PERFORMANCE STANDARDS

Performance standards and specifications of the major components of the remedial action to be designed and implemented by the Respondents are described below. Performance standards shall include cleanup standards, standards of control, quality criteria, and other requirements, criteria or limitations as established in the Decision Document, this SOW and the Orders to which it is attached.

See Appendix A, Decision Document, for description of the remedial action components and associated performance standards.

3.0 SCOPE OF THE REMEDIAL DESIGN AND REMEDIAL ACTION

The Remedial Design/Remedial Action (RD/RA) shall consist of seven principal tasks described below. Each task shall be completed and required documentation shall be submitted in accordance with the schedules established in the Orders and in the RD/RA Work Plan approved by Ohio EPA. All work related to this SOW shall be performed by the Respondents in a manner consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended, 42 USC 9601, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300 (1990), and other applicable federal and state rules and regulations.

Task Summary

- 3.1 Task I: RD/RA Work Plan
 - 3.1.1 Site Access
 - 3.1.2 Pre-Design Studies Plan
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3.1 **TASK I: RD/RA WORK PLAN**

The Respondents shall submit a work plan for the Remedial Design and Remedial Action (RD/RA) to the Ohio EPA for review and approval, which presents the overall strategy for performing the design, construction, operation, maintenance and monitoring of the Remedial Action (RA). The work plan shall provide a detailed discussion of the specific tasks necessary to implement the selected remedy, including a description of the technical

approach, personnel requirements, plans, specifications, permit requirements and other reports described in this SOW.

The work plan shall document the responsibilities and authority of all organizations and key personnel involved with the development and implementation of the RD/RA. The qualifications of key personnel directing the RD/RA tasks, including contractor personnel, shall be described.

The work plan shall include schedules fixed in real time for the development of the RD and implementation of the RA, including milestones for the submittal of the document packages for Ohio EPA review and meetings for discussion of the submittals. The RD/RA Work Plan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the RD.

Specific requirements to be addressed by the RD/RA Work Plan are described in the following sections.

3.1.1 Site Access

All site access agreements necessary to implement the RD and RA shall be obtained by the Respondents prior to the initiation of any activities to be conducted under the Work Plan. Site access agreements shall extend for the duration of all remedial activities and shall include allowances for all operation and maintenance considerations and State oversight activities. The work plan shall describe the activities necessary to satisfy these requirements.

3.1.2 Pre-Design Studies Plan

The Respondents shall develop a plan to complete the following pre-design studies, which are required to design and fully implement the remedial action.

The Pre-Design Studies Plan (PDSP), as a component of the RD/RA Work Plan, will identify and describe, in detail, activities necessary to conduct the pre-design studies identified above. The plan shall include sufficient sampling, testing, and analyses to develop quantitative performance, cost and design data for the selected remedy.

At the discretion of the Site Coordinator for the Ohio EPA, the PDSP may be submitted for review and comment under separate cover from the work plan in accordance with the schedule established in the Orders. The PDSP must be approved by the Ohio EPA prior to initiation of associated field activities or treatability studies.

The Pre-Design Studies Plan shall include, as necessary, a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan

(HSP). Section 4.0 of this SOW describes the required content of supporting plans such as the Field Sampling Plans, Quality Assurance Project Plans and Health and Safety Plans.

Prior to development of the Pre-Design Studies Plan, there shall be a meeting of the Site Coordinator for the Ohio EPA and the Project Manager representing the Respondents to discuss scope, objectives, quality assurance and quality control issues, resources, reporting, communication channels, schedule, and roles of personnel involved. Other personnel representing the Respondents and Ohio EPA, who may be needed to fully discuss the issues involved, should also participate in this meeting. Guidance documents to be consulted in developing the Pre-Design Studies Plan include U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies (EPA/540/G-89/004, October 1988) and Guide for Conducting Treatability Studies Under CERCLA (EPA/540/2-89/058, December 1989), as well as others listed in Appendix A, attached to this SOW.

The pre-design studies will be conducted as described under Task II.

3.1.3 Regulatory Compliance Plan

It shall be the responsibility of the Respondents to ensure compliance with all applicable regulatory state and federal requirements for the RD/RA activities to be conducted at the site. The Respondents shall develop a plan to identify and to satisfy all applicable state and federal laws and regulations for the RD/RA. The plan will include the following information:

- 1) Permitting authorities
- 2) Permits required to conduct RD/RA activities
- 3) Time required by the permitting agency(s) to process permit applications
- 4) Identification of all necessary forms
- 5) Schedule for submittal of applications
- 6) All monitoring and/or compliance testing requirements

The Respondents shall identify in the plan any inconsistencies between any regulatory requirements or permits that may affect any of the work required. The plan shall also include an analysis of the possible effects such inconsistencies may have on the remedial action, recommendations, and supporting rationale for the recommendations. The Regulatory Compliance Plan shall be submitted to the Ohio EPA as part of the RD/RA Work Plan.

3.1.4 Natural Resource Damage Assessment

If natural resources are or may be injured as a result of a release, the Respondents shall ensure that the trustees of the effected natural resources are notified. The trustees will initiate appropriate actions and provide input into the RD/RA in order to

minimize or mitigate natural resource damages in accordance with the NCP and 43 CFR part 11. Trustees define "injury" as "a measurable adverse change, either long- or short-term, in the chemical or physical quality of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance. The Respondents shall make available to the trustees all necessary information and documentation needed to assess actual or potential natural resource injuries.

3.2 TASK II: PRE-DESIGN STUDIES

The Respondents shall schedule and detail the work necessary to accomplish the pre-design studies described in the Pre-Design Studies Plan submitted with the RD/RA Work Plan. The requirements of this section shall apply to studies undertaken to refine the understanding of the nature and extent of contamination at the site, as well as to bench and pilot scale treatability studies.

For any such studies required, the Respondents shall furnish all services, including necessary field work, materials, supplies, labor, equipment, supervision, and data interpretation. Sufficient sampling, testing, and analyses shall be performed to provide the technical data necessary to support the remedial design effort with the goal of optimizing the required treatment and/or disposal operations and systems.

The Respondents shall submit a draft Pre-Design Studies report for Ohio EPA's review and comment when the investigation and/or testing required by the Pre-Design Studies Plan is complete. The draft report shall present investigation/testing data and results along with an analysis of the implications those results have on the RD/RA, including a cost analysis, when appropriate. The draft report shall be submitted prior to the preliminary design submittal in accordance with the schedule specified in the Orders and approved RD/RA Work Plan. After making any required corrections or modifications based on Ohio EPA comments, the Respondents shall submit the final report with the Preliminary Design Report, unless otherwise specified in the approved RD/RA Work Plan.

3.2.1. Reporting Requirements for Groundwater Data

The Respondents shall submit all groundwater data and monitoring well construction data. The Respondents shall implement a groundwater monitoring program as identified in the RD workplan or as required by Ohio EPA. Respondents shall submit all groundwater data and monitoring well construction data on a compact disk (CD). Respondents shall submit one copy of each round of sampling data on printed paper in addition to the CD format. The printed copy will be the official copy of the data.

3.3 TASK III: REMEDIAL DESIGN

The Respondents shall prepare and submit to the Ohio EPA, in accordance with the

schedule set forth in the compliance schedule of the Orders, construction plans, specifications and supporting plans to implement the remedial action at the Site as defined in the Purpose and Description of the Remedial Action sections of this SOW, the Decision Document, and/or the Orders.

3.3.1 General Requirements for Plans and Specifications

The construction plans and specifications shall comply with the standards and requirements outlined below. All design documents shall be clear, comprehensive and organized. Supporting data and documentation sufficient to define the functional aspects of the remedial action shall be provided. Taken as a whole, the design documents shall demonstrate that the remedial action will be capable of meeting all objectives of the Decision Document, including any performance standards.

The plans and specifications shall include the following:

- 1) Discussion of the design strategy and design basis including:
 - a. Compliance with requirements of the Decision Document and the Orders and all applicable regulatory requirements;
 - b. Minimization of environmental and public health impacts;
- 2) Discussion of the technical factors of importance including:
 - a. Use of currently accepted environmental control measures and technologies;
 - b. The constructability of the design;
 - c. Use of currently accepted construction practices and techniques;
- 3) Description of the assumptions made and detailed justification for those assumptions;
- 4) Discussion of possible sources of error and possible operation and maintenance problems;
- 5) Detailed drawings of the proposed design including, as appropriate:
 - a. Qualitative flow sheets;
 - b. Quantitative flow sheets;
- 6) Tables listing equipment and specifications;
- 7) Tables giving material and energy balances;
- 8) Appendices including:
 - a. Sample calculations (one example presented and clearly explained for significant or unique calculations);

- b. Derivation of equations essential to understanding the report;
- c. Results of laboratory tests, field tests and any additional studies.

3.3.2 Design Phases

The Respondents shall meet when necessary with Ohio EPA representatives to discuss design issues. The design shall be developed and submitted in the phases outlined below to facilitate progression toward an acceptable and functional design.

Submittals shall be made in accordance with the compliance schedule in the Orders, and the schedule in the approved RD/RA Work Plan.

3.3.2.1 Preliminary Design

A Preliminary Design, which reflects the design effort at approximately 30% completion, shall be submitted to the Ohio EPA for review and comment. At this stage of the design process, the Respondents shall have verified existing conditions at the site that may influence the design and implementation of the selected RA. The Preliminary Design shall demonstrate that the basic technical requirements of the remedial action and any permits required have been addressed. The Preliminary Design shall be reviewed to determine if the final design will provide an operable and usable RA that will be in compliance with all permitting requirements and response objectives. The Preliminary Design submittal shall include the following elements, at a minimum:

- Preliminary plans, drawings and sketches, including design calculations;
- Results of treatability studies and additional field sampling;
- Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for treatment systems, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
- Proposed cleanup verification methods, including compliance with applicable laws and regulations;
- Outline of design specifications;
- Proposed siting/locations of processes/construction activity;
- Expected long-term operation and monitoring requirements;
- Real estate and easement requirements;
- Preliminary construction schedule, including contracting strategy.

The supporting data and documentation necessary to define the functional aspects of the RA shall be submitted with the Preliminary Design. The technical specifications shall be outlined in a manner that anticipates the scope of the final specifications. The Respondents shall include design

calculations with the Preliminary Design completed to the same degree as the design they support.

If the Pre-Design Studies Report required under Task II has not been submitted prior to submission of the Preliminary Design, it shall be submitted with the Preliminary Design. Any revisions or amendments to the Preliminary Design required by the Ohio EPA shall be incorporated into the subsequent design phase.

3.3.2.2 Intermediate Design

Complex project designs necessitate preparation and Ohio EPA review of design documents between the preliminary and prefinal design phases. The Respondents shall submit intermediate design plans and specifications to the Ohio EPA for review and comment when the design is approximately 60% complete in accordance with the schedule in the approved RD/RA Work Plan. All plans, specifications, design analyses and design calculations submitted to the Ohio EPA shall reflect the same degree of completion. The Respondents shall ensure that any required revisions or amendments resulting from the Ohio EPA's review of the Preliminary Design are incorporated into the Intermediate Design.

The Intermediate Design submittal shall include the following components:

- Design Plans and Specifications;
- Draft Construction Quality Assurance Plan;
- Draft Performance Standard Verification Plan;
- Draft Operation and Maintenance Plan;
- Health and Safety Plan.

The design shall include a Construction Quality Assurance Plan, a Performance Standard Verification Plan, an Operation and Maintenance Plan, and a Health and Safety Plan. The Performance Verification Plan shall include a Field Sampling Plan and a Quality Assurance Project Plan, as necessary. Section 4.0 of this SOW describes the required content of the supporting plans. The final Pre-Design Studies Report shall also be included, if it has not already been submitted. Revisions or amendments to the Intermediate Design required by Ohio EPA shall be incorporated into the Prefinal Design.

3.3.2.3 Prefinal Design

The Respondents shall submit a Prefinal Design for Ohio EPA review in accordance with the schedule in the approved RD/RA Work Plan when the design effort is at least 90% complete. The Respondents shall ensure that

any modifications required by the Ohio EPA's prior review of related Pre-design Studies Reports, technical memoranda, the Preliminary and Intermediate Designs, and the QAPP and HSP are incorporated into the Prefinal Design submittal. The Prefinal Design submittal shall consist of the following components, at a minimum:

- Design Plans and Specifications;
- Construction Quality Assurance Plan;
- Performance Standard Verification Plan;
- Operation and Maintenance Plan;
- Remedial Action Implementation Plan;
- Cost Estimate;
- Health and Safety Plan.

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the remedial design specifications with the Prefinal Design, the Respondents shall: (1) Coordinate and cross-check the specifications and drawings; (2) Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

The Respondents shall prepare and include in the technical specifications governing any treatment systems; contractor requirements for providing appropriate service visits by qualified personnel to supervise the installation, adjustment, startup and operation of the treatment systems; and appropriate training on operational procedures once startup has been successfully accomplished.

The Ohio EPA will provide written comments to the Respondents indicating any required revisions to the Prefinal Design. Comments may be provided as a narrative report and/or markings on design plan sheets. Revisions to the plans and specifications required by Ohio EPA shall be incorporated into the Final Design. At the discretion of the Site Coordinator, the Respondents shall also return to Ohio EPA all marked-up prints as evidence that the plans have been completely checked. The Prefinal Design submittal may serve as the Final Design, if Ohio EPA has no further comments and notifies the Respondents that the Prefinal Design has been approved as the Final Design.

3.3.2.4 Final Design

Following incorporation of any required modifications resulting from the Ohio EPA's review of the Prefinal Design submittal, the Respondents shall submit to the Ohio EPA the Final Design which is 100% complete in accordance with the approved schedule described in the RD/RA Workplan.

The Final Design submittal shall include all the components of the Prefinal Design and each of those components shall be complete. At the discretion of the Site Coordinator, any marked-up prints or drawings, which the Ohio EPA may have provided by way of comments on previous design submittals shall be returned to the Ohio EPA, if they have not already been returned.

The Respondents shall make corrections or changes based on Ohio EPA comments on the Final Design submittals. The revised Final Design shall then be submitted in their entirety to the Ohio EPA for approval as the completed Final Design. Upon approval of the Site Coordinator, final corrections may be made by submitting corrected pages to the Final Design design documents. The quality of the Final Design submittal should be such that the Respondents would be able to include them in a bid package and invite contractors to submit bids for the construction project.

3.3.3 Estimated Cost of the Remedial Action

The Respondents shall refine the cost estimate developed in the Feasibility Study to reflect the detailed plans and specifications being developed for the RA. The cost estimate shall include both capital and operation and maintenance costs for the entire project. To the degree possible, cost estimates for operation and maintenance of any treatment system shall be based on the entire anticipated duration of the system's operation. The final estimate shall be based on the final approved plans and specifications. It shall include any changes required by the Ohio EPA during Final Design review, and reflect current prices for labor, material and equipment.

The refined cost estimate shall be submitted by the Respondents with the Prefinal Design and the final cost estimate shall be included with the Final Design submittal.

3.3.4 Remedial Action Implementation Plan

The Respondents shall develop a Remedial Action Implementation Plan (RAIP) to help coordinate implementation of the various components of the RA. It shall include a schedule for the RA that identifies timing for initiation and completion of all critical path tasks. The Respondents shall specifically identify dates for completion of the project and major interim milestones in conformance with the approved RD/RA Workplan schedule. The Remedial Action Implementation Plan is a management tool which should address the following topics:

- 1) Activities necessary to fully implement each of the components of the RA;
- 2) How these activities will be coordinated to facilitate construction/implementation in accordance with the approved schedule;
- 3) Potential major scheduling problems or delays, which may impact overall schedule;

- 4) Lines of communication for discussing and resolving problems, should they arise;
- 5) Common and/or anticipated remedies to overcome potential problems and delays.

The Remedial Action Implementation Plan shall be submitted with the Prefinal Design for review and comment by the Ohio EPA. The final plan and RA project schedule shall be submitted with the Final Design for review and approval.

3.3.5 Community Relations Support

A community relations program will be implemented by the Ohio EPA. The Respondents shall cooperate with the Ohio EPA in community relations efforts. Cooperation may include participation in preparation of all appropriate information disseminated to the public, and in public meetings that may be held or sponsored by the Ohio EPA concerning the Site.

3.4 TASK IV: REMEDIAL ACTION CONSTRUCTION

Following approval of the Final Design submittal by the Ohio EPA, the Respondents shall implement the designed remedial actions at the Site in accordance with the plans, specifications, Construction Quality Assurance Plan, Performance Standard Verification Plan, Health and Safety Plan, Remedial Action Implementation Plan, Quality Assurance Project Plan, and Field Sampling Plan approved with the final design. Implementation shall include the activities described in the following sections.

3.4.1 Preconstruction Inspection and Conference

The Respondents shall participate in a preconstruction inspection and conference with the Ohio EPA to accomplish the following:

- Review methods for documenting and reporting inspection data;
- Review methods for distributing and storing documents and reports;
- Review work area security and safety protocol;
- Discuss any appropriate modifications to the Construction Quality Assurance Plan to ensure that site specific considerations are addressed. The final CQAP shall be submitted to the Ohio EPA at this time, if it has not already been submitted;
- Introduce key construction contractor, engineering and project management personnel and review roles during construction activities;
- Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The Respondents shall schedule the preconstruction inspection and conference to

be held within 10 days of the award of the construction contract. The preconstruction inspection and conference shall be documented by a designated person and minutes shall be transmitted to all parties by the Respondents to all parties in attendance.

3.4.2 Design Changes During Construction

During construction, unforeseen site conditions, changes in estimated quantities of required construction materials and other problems associated with the project are likely to develop. Such changing conditions may require either major or minor changes to the approved final design. Certain design changes will require approval of the Ohio EPA prior to implementation to ensure that the intent and scope of the remedial action is maintained. Changes, which could alter the intent or scope of the RA, may require a revision to the Decision Document and a public comment period. Changes to the remedial design which require Ohio EPA written approval prior to implementation include:

- Those that involve the deletion or addition of a major component of the approved remedy (e.g. changing one treatment system for another; deleting any designed layer of a multi-layer cap);
- Those that result in a less effective treatment for wastes associated with the site;
- Any changes that may result in an increase of the exposure to chemicals of concern and/or risk to human health or the environment as compared to the goals for the completed remedial action as stated in the Orders and this SOW;
- Those that result in a significant delay in the completion of the RA;
- Any other changes that alter or are outside of the scope or intent of the approved remedial design.

Ohio EPA shall be notified of other changes made during construction through daily inspection reports and monthly progress reports.

3.4.3 Remedial Action Construction Completion and Acceptance

As the construction of the remedial action nears completion, the following activities and reporting shall be completed by the Respondents to ensure proper project completion, approval, closeout and transition to the operation and maintenance/monitoring phase.

3.4.3.1 Prefinal Construction Conference

Within seven days of making a preliminary determination that construction is

complete, the Respondents shall provide written notification to the Ohio EPA and a prefinal construction conference shall be held with the construction contractor(s) to discuss procedures and requirements for project completion and closeout. The Respondents shall have responsibility for making arrangements for the conference. Participants should include the Project Manager for the Respondents, the Site Coordinator for the Ohio EPA, all contractors involved with construction of the remedial action(s) and the remedial design agent (person(s) who designed the remedy), if requested.

A list of suggested items to be covered at the conference includes, but is not limited to the following:

- Final Operation and Maintenance (O&M) Plan submission, if it has not been submitted already;
- Cleanup responsibilities;
- Demobilization activities;
- Security requirements for project transfer;
- Prefinal inspection schedule;
- Operator training.

The prefinal conference shall be documented by a designated person and minutes shall be transmitted to all parties in attendance by the Respondents.

3.4.3.2 Prefinal Inspection

Following the prefinal construction conference, a prefinal inspection of the project will be conducted. The prefinal inspection will be led by the Ohio EPA with assistance from the party with primary responsibility for construction inspection, if requested.

The prefinal inspection will consist of a walk-through inspection of the entire site. The completed site work will be inspected to determine whether the project is complete and consistent with the contract documents and the approved RD/RA Work Plan. Any outstanding deficient or incomplete construction items should be identified and noted during the inspection.

When the RA includes construction of a treatment system, the facility start-up and "shakedown" shall have been completed as part of the RA. "Shakedown" is considered to be the initial operational period following start-up during which adjustments are made to ensure that the performance standards for the system are reliably being achieved. The contractor shall have certified that the equipment has performed to meet the purpose and intent of the contract specifications. Retesting shall have been successfully completed where deficiencies were revealed. Such shakedown may take several months. Determination of remedy effectiveness for other types of

remedial actions will be based on the Performance Standard Verification Plan (PSVP).

If construction of major components of a remedial action is performed in distinct phases or under separate contracts due to the complex scope of the site remedy, it may be appropriate to conduct the prefinal inspections of those components separately. The approved RAIP should identify those projects and components, which should be handled in that manner.

Upon completion of the prefinal inspection, an inspection report shall be prepared by the Respondents and submitted to Ohio EPA with the minutes from the prefinal conference. A copy of the report will be provided to all parties in attendance at the inspection. The report will outline the outstanding construction items, actions required to resolve those items, completion date for those items and a date for the final inspection. Ohio EPA will review the inspection report and notify the Respondents of any disagreements with it.

3.4.3.3 Final Inspection

Within seven days following completion of any outstanding construction items, the Respondents shall provide written notification to the Ohio EPA and schedule a final inspection. A final inspection will be conducted by the Ohio EPA with assistance from the party having primary responsibility for construction inspection, if requested.

The final inspection will consist of a walk-through inspection of the project site focusing on the outstanding construction items identified during the prefinal inspection. The Prefinal Inspection Report shall be used as a checklist. The contractor's demobilization activities shall have been completed, except for equipment and materials required to complete the outstanding construction items. If any items remain deficient or incomplete, the inspection shall be considered a prefinal inspection requiring another prefinal inspection report and final inspection.

As with the prefinal inspection, it may be appropriate to conduct final inspections of major components of a remedial action separately. Such projects and components should be identified in the approved Remedial Action Implementation Plan.

3.4.3.4 Construction Completion Report and Certification

Upon satisfactory completion of the final inspection, a Construction Completion Report shall be prepared by the Respondents and submitted to the Ohio EPA within 30 days after the final inspection. The report shall

include the following elements:

- 1) A brief description of the outstanding construction items from the prefinal inspection and an indication that the items were satisfactorily resolved;
- 2) A synopsis of the work defined in the approved RD/RA Work Plan and the Final Design and certification that this work was performed;
- 3) An explanation of any changes to the work defined in the approved RD/RA Work Plan and Final Design, including as-built drawings of the constructed RA facilities, and why the changes were necessary or beneficial for the project;
- 4) Certification that the constructed RA or component of the RA is operational and functional.

The construction completion report will be reviewed by the Ohio EPA. If Ohio EPA's review indicates that corrections or amendments to the report are necessary, comments will be provided to the Respondents. The Respondents shall submit a revised construction completion report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments. Upon determination by the Ohio EPA that the report is acceptable, written notice of Ohio EPA's approval of the construction completion report will be provided to the Respondents.

3.4.4 Community Relations Support

The Respondents shall provide support for Ohio EPA's community relations program during remedial action implementation as described in Section 3.3.5.

3.5 TASK V: FIVE-YEAR REVIEWS

At sites where contaminants will remain at levels that will not permit unrestricted use of the site, a review will be conducted no less frequently than once every five years to ensure that the remedy continues to be protective of human health and the environment. This is known as the "five-year review". The Respondents shall complete Five-Year Review Reports no less often than every five years after the initiation of the remedial action or until contaminant levels allow for unrestricted use of the site. Further guidance for performing five-year review work tasks may be found in the U.S. EPA OSWER Directive 9355.7-02, Structure and Components of Five-Year Reviews.

The more specific purpose of the reviews is two-fold: (1) to confirm that the remedial action as specified in the Decision Document and as implemented continues to be effective in protecting human health and the environment (e.g., the remedy is operating and

functioning as designed, institutional controls are in place and are protective); and (2) to evaluate whether original cleanup levels remain protective of human health and the environment. A further objective is to evaluate the scope of operation and maintenance, the frequency of repairs, changes in monitoring indicators, costs at the site, and how each of these relates to protectiveness.

Fifteen months prior to the due date for completion of a five-year review, the Respondents shall meet with Ohio EPA to discuss the requirements of the five-year review. The review must be completed within five years following the initiation of the remedial action. The scope and level of review will depend on conditions at the site. The scoping effort should include a determination by the Site Coordinator and Respondents as to whether available monitoring data and other documentation will be sufficient to perform the five-year review or whether a field sampling effort will be a necessary component of the review. Within three months of the meeting, the Respondents shall develop and submit a workplan to Ohio EPA that shall describe, at a minimum, the following activities and documentation:

1. Document Review
 - a. Background Information
 1. Decision Document
 2. Decision Document Summary
 3. Administrative or Judicial Order for RD/RA
 4. Completion of Remedial Action Report
 - b. Design Review
 - c. Maintenance and Monitoring
 1. O&M Manual
 2. O&M Reports
 3. Groundwater Monitoring Plan
 4. Monitoring Data and Information
2. Standards Review
 - a. Specific performance standards required by Decision Document
 - b. Changing Standards
 1. Laws and Regulations applicable to conditions and activities at the site
 - c. Risk Assessment
 1. As summarized in the Decision Document
 2. Review for changes in exposure pathways not previously evaluated
3. Interviews
 - a. Background Information
 1. Previous Staff Management
 2. Nearest Neighbors, Respondents
 - b. Local Considerations
 1. State Contacts

- 2. Local Government Contacts
- c. Operational Problems
 - 1. Plant Superintendent
 - 2. O&M Contractors
- 4. Site Inspection/Technology Review
 - a. Performance and Compliance
 - 1. Visual Inspection
 - b. Offsite Considerations
 - c. Recommendations
- 5. Report
 - a. Background
 - 1. Introduction
 - 2. Remedial Objectives
 - 3. Review of Applicable Laws and Regulations
 - b. Site Conditions
 - 1. Summary of Site Visit
 - 2. Areas of Noncompliance
 - c. Risk Assessment
 - d. Recommendations
 - 1. Technology Recommendations
 - 2. Statement on Protectiveness
 - 3. Timing and Scope of Next Review
 - 4. Implementation Requirements

If sampling and analysis of environmental samples is required under the five-year review, the Respondents are required to prepare and submit with the workplan other supporting plans. Supporting plans may include a Quality Assurance Project Plan, Field Sampling Plan and Health and Safety Plan. The purpose and content of these supporting plans are discussed in Section 4 of this SOW. The Five-Year Review Workplan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the five-year review.

The Five-Year Review Report will be reviewed by the Ohio EPA. If Ohio EPA's review indicates that corrections or amendments to the report are necessary, comments will be provided to the Respondents. The Respondents shall submit a revised Five-Year Review Report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments.

3.6 TASK VI: OPERATION AND MAINTENANCE/PERFORMANCE MONITORING

The Respondents shall implement performance monitoring and operation and maintenance procedures as required by the approved Performance Standard Verification Plan and approved Operation and Monitoring (O&M) Plan for the RA once it is demonstrated that the RA components are operational and functional.

3.6.1 Reporting During Operation and Maintenance

3.6.1.1 Operation and Maintenance Sampling and Analysis Data

Unless otherwise specified in the approved O&M Plan, sampling, analysis, and system performance data for any treatment system or other engineering systems required to be monitored during the O&M Phase shall be submitted by the Respondents to the Ohio EPA on a monthly basis. These monthly submittals will form the basis for the annual progress report described below in Section 3.6.1.2

3.6.1.2 Progress Reports During Operation and Maintenance

The Respondents shall prepare and submit annual progress reports during the operation and maintenance/performance monitoring phase of the RA. When appropriate, the RD/RA Work Plan shall specify progress reports during O&M to be submitted more frequently.

The O&M progress reports shall contain the same information as required for the monthly progress reports for the RD and RA construction phases, as specified in Section 3.6.1 of this SOW. It shall also include an evaluation of the effectiveness of any treatment and engineering systems in meeting the cleanup standards, performance standards and other goals of the RA as defined in the Orders, this SOW, the RD/RA Work Plan and the approved Final Design.

3.6.2 Completion of Remedial Action Report

At the completion of the remedial action, the Respondents shall submit a Completion of Remedial Action Report to the Ohio EPA. The RA shall be considered complete when the all of the goals, performance standards and cleanup standards for the RA as stated in the Decision Document, this SOW, and the approved Final Design (including changes approved during construction) have been met. The report shall document that the project is consistent with the design specifications, and that the RA was performed to meet or exceed all required goals, cleanup standards and performance standards. The report shall include, but not be limited to the following elements:

- 1) Synopsis of the remedial action and certification of the design and construction;
- 2) Listing of the cleanup and performance standards as established in the Decision Document and the Orders, any amendments to those standards with an explanation for adopting the amendments;
- 3) Summary and explanation of any changes to the approved plans and

specifications. An explanation of why the changes were necessary should be included and, where necessary, Ohio EPA approval of the changes should be documented;

- 4) Summary of operation of treatment systems including monitoring data, indicating that the remedial action met or exceeded the performance standards or cleanup criteria;
- 5) Explanation of any monitoring and maintenance activities to be undertaken at the site in the future as outlined in Section 3.0 of this RD/RA SOW.

3.7 TASK VII: REPORTING REQUIREMENTS

The Respondents shall prepare and submit work plans, design plans, specifications, and reports as set forth in Tasks I through V of this SOW to document the design, construction, operation, maintenance, and performance monitoring of the remedial action. Monthly progress reports shall be prepared, as described below, to enable the Ohio EPA to track project progress.

3.7.1 Monthly Progress Reports during RD and RA Construction

The Respondents shall at a minimum provide the Ohio EPA with monthly progress reports during the design and construction phases of the remedial action containing the information listed below. When appropriate, the RD/RA Work Plan shall specify progress reports to be submitted more frequently.

- 1) A description of the work performed during the reporting period and estimate of the percentage of the RD/RA completed
- 2) Summaries of all findings and sampling during the reporting period
- 3) Summaries of all changes made in the RD/RA during the reporting period, indicating consultation with Ohio EPA and approval by the Ohio EPA of those changes, when necessary
- 4) Summaries of all contacts with representatives of the local community, public interest groups or government agencies during the reporting period
- 5) Summaries of all problems or potential problems encountered during the reporting period, including those which delay or threaten to delay completion of project milestones with respect to the approved work plan schedule or RAIP schedule
- 6) Summaries of actions taken and being taken to rectify problems
- 7) Summaries of actions taken to achieve and maintain cleanup standards and performance standards
- 8) Changes in personnel during the reporting period
- 9) Projected work for the next reporting period
- 10) Copies of daily reports, inspection reports, sampling data, laboratory/ monitoring data, etc.

3.7.2 Summary of Reports and Submittals

A summary of the information reporting requirements contained in this RD/RA SOW is presented below:

- **Draft RD/RA Work Plan**
 - Health and Safety Plan (HSP)
 - Regulatory Compliance Plan
- **Final RD/RA Work Plan**
 - HSP
 - Regulatory Compliance Plan
- **Draft Pre-Design Studies Plan**
 - Quality Assurance Project Plan (QAPP)
 - Field Sampling Plan (FSP)
- **Final Pre-Design Studies Plan**
 - QAPP
 - FSP
- **Pre-Design Studies Reports - Draft**
- **Preliminary Design Documents**
- **Pre-Design Studies Reports - Final**
- **Intermediate Design Documents**
 - Draft Construction Quality Assurance Plan (CQAP)
 - Draft Performance Standard Verification Plan (PSVP)
 - Draft O & M Plan
 - Health and Safety Plan
- **Prefinal Design Documents**
 - CQAP
 - PSVP
 - O & M Plan
 - Draft Remedial Action Implementation Plan (RAIP)
 - Health and Safety Plan
- **Final Design Documents**
 - CQAP
 - PSVP
 - O & M Plan
 - Draft RAIP
 - Health and Safety Plan
- **Preconstruction Inspection and Conference Report**
- **Monthly Progress Reports During RD/RA**
- **Notification of Preliminary Completion of Construction**
- **Final O & M Plan**
- **Prefinal Inspection Report**
- **Notification for Final Inspection**
- **Construction Completion Report**
- **O & M Sampling Data**
- **Progress Reports during O&M/Performance Monitoring period**

- Completion of Remedial Action Report
- Five-Year Review Workplan
- Five-Year Review Report

4.0 CONTENT OF SUPPORTING PLANS

The documents listed in this section shall be prepared and submitted as outlined in Section 3.0 of this SOW to support the activities necessary to design and fully implement the RA. These supporting documents include a Quality Assurance Project Plan (QAPP), a Field Sampling Plan (FSP), a Health and Safety Plan (HSP), a Construction Quality Assurance Plan (CQAP) and a Performance Standard Verification Plan (PSVP). The following sections describe the required contents of each of these supporting documents.

4.1 QUALITY ASSURANCE PROJECT PLAN

The Respondents shall prepare a site-specific Quality Assurance Project Plan (QAPP) to cover sample analysis and data handling based on guidance provided by the Ohio EPA. Refer to the list of Ohio EPA and U.S. EPA guidance documents in Appendix B attached to the Orders.

A QAPP shall be developed for any sampling and analysis activities to be conducted as pre-design studies and submitted with the Pre-Design Studies Plan for Ohio EPA review and approval.

During the remedial design phase the Respondents shall review all remedial design information and modify or amend the QAPP developed for the Pre-Design Studies Plan, as necessary, to address the sampling and analysis activities to be conducted during implementation of the Remedial Action, including activities covered by the PSVP and O&M Plan. An amended QAPP shall be submitted with the Intermediate Design documents for review and comment by Ohio EPA. A final Quality Assurance Project Plan, which incorporates comments made by the Ohio EPA, shall be submitted for approval with the Final Design documents. Upon agreement of the Site Coordinator, the Respondents may submit only the amended portions of the QAPP developed for the PDSP with the Intermediate, Pre-Final and Final Design documents.

The Respondents shall schedule and attend a pre-QAPP meeting with representatives of Ohio EPA to discuss the scope and format of the QAPP. For sites where the Site Coordinator and Project Manager agree that a pre-QAPP meeting is not needed, this meeting may be omitted. The QAPP shall, at a minimum, include:

1. Data Collection Strategy - The strategy section of the QAPP shall include but not be limited to the following:
 - a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;
 - b. Description of methods and procedures to be used to assess the

- precision, accuracy and completeness of the measurement data;
 - c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:
 - i) Environmental conditions at the time of sampling;
 - ii) Sampling design (including number, location and distribution);
 - iii) Representativeness of selected media, exposure pathways, or receptors; and
 - iv) Representativeness of selected analytical parameters.
 - v) Representativeness of testing procedures and conditions; and
 - vi) Independence of background or baseline from site influences.
 - d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:
 - i) RD/RA data collected by the Respondents over some time period;
 - ii) RD/RA data generated by an outside laboratory or consultant employed by the Respondents versus data collected by the Respondents, and;
 - iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RD/RA effort.
 - iv) Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA;
 - e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:
 - i) Periodic assessment of measurement data accuracy, precision and completeness;
 - ii) Results of performance audits;
 - iii) Results of system audits;
 - iv) Significant quality assurance problems and recommended solutions; and
 - v) Resolutions of previously stated problems.
2. Sample Analysis - The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:
- a. Chain-of-custody procedures, including:
 - i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;
 - ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and

- iii) Specification of laboratory sample custody procedures for sample handling, storage and dispersment for analysis.
 - b. Sample storage procedures and storage times;
 - c. Sample preparation methods;
 - d. Analytical procedures, including:
 - i) Scope and application of the procedure;
 - ii) Sample matrix;
 - iii) Potential interferences;
 - iv) Precision and accuracy of the methodology;
 - v) Method detection limits;
 - vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and
 - vii) Verification and reporting of tentatively identified compounds.
 - e. Calibration procedures and frequency;
 - f. Data reduction, validation and reporting;
 - g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
 - i) Method blank(s);
 - ii) Laboratory control sample(s);
 - iii) Calibration check sample(s);
 - iv) Replicate sample(s);
 - v) Matrix-spiked sample(s);
 - vi) "Blind" quality control sample(s);
 - vii) Control charts;
 - viii) Surrogate samples;
 - ix) Zero and span gases; and
 - x) Reagent quality control checks.
 - h. Preventative maintenance procedures and schedules;
 - i. Corrective action (for laboratory problems); and
 - j. Turnaround time.
- 3. Modeling - The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:
 - a. Model assumptions and operating conditions;
 - b. Input parameters; and
 - c. Verification and calibration procedures.
- 4. In Situ or Laboratory Toxicity Tests - The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassays used to predict or describe impacts of contaminants on a population, community, or ecosystem level.
- 5. Data Record - The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in a, b,

and c below:

- a. The data record shall include the following:
 - i) Unique sample or field measurement code;
 - ii) Sampling or field measurement location and sample or measurement type;
 - iii) Sampling or field measurement raw data;
 - iv) Laboratory analysis ID number;
 - v) Property or component measured; and
 - vi) Result of analysis (e.g., concentration).
- b. Tabular Displays - The following data shall be presented in tabular displays:
 - i) Unsorted (raw) data;
 - ii) Results for each medium, organism, or for each constituent measured;
 - iii) Data reduction for statistical analysis;
 - iv) Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);
 - v) Summary data (i.e., mean, standard deviation, min/max values, and sample number); and
 - vi) Comparisons with background or reference data.
- c. Graphical Displays - The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):
 - i) Display sampling locations and sampling grid;
 - ii) Indicate boundaries of sampling area, and areas where more data are required;
 - iii) Display levels of contamination at each sampling location or location from which organism was taken;
 - iv) Display geographical extent of contamination;
 - v) Display contamination levels, averages and maxima;
 - vi) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;
 - vii) Indicate features affecting intramedia transport and show potential receptors;
 - viii) Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and
 - ix) Display comparisons with background or reference analyses or measurements.

4.2 FIELD SAMPLING PLAN

1. Sampling - The Sampling section of the Field Sampling Plan shall discuss:
 - a. Sufficient preliminary sampling to ensure the proper planning of items b. through o. below;

- b. Selecting appropriate sampling locations, depths, vegetation strata, organism age, etc. and documenting relevance of sample for intended biological toxicity tests or analyses;
- c. Providing a sufficient number of samples to meet statistical or other data useability objectives;
- d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;
- e. Determining environmental conditions under which sampling should be conducted;
- f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);
- g. Determining which parameters are to be measured and where;
- h. Selecting the frequency and length of sampling period;
- i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);
- j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989);
- k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- l. Documenting field sampling operations and procedures, including:
 - i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);
 - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
 - iii) Documentation of specific sample preservation method;
 - iv) Calibration of field devices;
 - v) Collection of replicate and field duplicate samples;
 - vi) Submission of field-biased and equipment blanks, where appropriate;
 - vii) Potential interferences present at the site or facility;
 - viii) Construction materials and techniques associated with monitoring wells and piezometers;
 - ix) Field equipment listing and sample containers;
 - x) Sampling order; and
 - xi) Decontamination procedures.
- m. Selecting appropriate sample containers;
- n. Sample preservation; and
- o. Chain-of-custody, including:
 - i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;
 - ii) Sample sealing, storing and shipping procedures to protect the

- iii) integrity of the sample; and
- iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

2. Field Measurements - The Field Measurements section of the Field Sampling Plan shall discuss:

- a. Selecting appropriate field measurement locations, depths, organism age etc.;
- b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;
- c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);
- f. Determining which physical, chemical, or biological parameters are to be measured and where;
- g. Selecting the frequency and duration of field measurement; and
- h. Documenting field measurement operations and procedures, including:
 - i) Procedures and forms for recording raw data and the exact location, time and Site specific considerations associated with the data acquisition;
 - ii) Calibration of field devices;
 - iii) Collection of replicate measurements;
 - iv) Submission of field-biased blanks, where appropriate;
 - v) Potential interferences present at the Site;
 - vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
 - vii) Field equipment listing;
 - viii) Order in which field measurements were made; and
 - ix) Decontamination procedures; and
 - x) Selecting the number, location, media, and organisms for determining background or reference conditions.

4.3 SITE HEALTH AND SAFETY PLAN

The Respondents shall submit a Health and Safety Plan (HSP) to the Ohio EPA with the RD/RA Work Plan for any on-site activities taking place during the design phase. The Respondents shall review the remedial design information and modify the HSP developed for the RD/RA Work Plan, as necessary, to address the activities to be conducted on the site during implementation of the Remedial Action. It shall be designed to protect on-site personnel and area residents from physical, chemical and other hazards posed by the

construction, operation and maintenance activities of the Remedial Action.

The Respondents shall prepare a site HSP which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by RD/RA activities. The HSP shall address the following topics:

1. Major elements of the Health and Safety Plan shall include:
 - a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;
 - b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;
 - c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;
 - d. Delineation of work area, including a map;
 - e. Description of levels of protection to be worn by personnel in the work area;
 - f. Description of the medical monitoring program for on-site responders;
 - g. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;
 - h. The establishment of procedures to control site access;
 - i. Description of decontamination procedures for personnel and equipment;
 - j. Establishment of site emergency procedures;
 - k. Availability of emergency medical care for injuries and toxicological problems;
 - l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);
 - m. Specification of any routine and special training required for responders; and
 - n. Establishment of procedures for protecting workers from weather related problems.

2. The Health and Safety Plan shall be consistent with:
 - a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
 - b. CERCLA Sections 104(f) and 111(c)(6)
 - c. EPA Order 1440.3 -- Respiratory Protection;
 - d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
 - e. EPA Occupational Health and Safety Manual;
 - f. EPA Interim Standard Operating Safety Procedures and other EPA

- g. guidance as developed by EPA;
- h. OSHA regulations particularly in 29 CFR 1910 and 1926;
- i. State and local regulations; and
- i. Site or facility conditions.

4.4 CONSTRUCTION QUALITY ASSURANCE PLAN

The Respondents shall develop a Construction Quality Assurance Plan (CQAP) based on the plans and specifications and performance standards for the RA. The CQAP is a site specific document that shall specify procedures to ensure that the completed remedial action work meets or exceeds all design criteria and specifications. A draft CQAP shall be submitted with the Intermediate Design submittal for review and comment by the Ohio EPA. Subsequent drafts shall be submitted with the Prefinal and Final Design submittals that incorporate comments made by the Ohio EPA. Certain aspects of the CQAP, for example personnel names and qualifications, may not be known at the time of design approval. A complete and final CQAP shall be submitted to Ohio EPA for approval prior to the start of construction. At a minimum, the CQAP shall address the elements listed below.

4.4.1 Responsibility and Authority

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the remedial action(s) shall be described fully in the CQAP. The Respondents shall provide a copy of the approved CQAP to each organization with responsibility and authority for implementing the CQAP. The Respondents shall also identify a CQA officer and the necessary supporting inspection staff.

4.4.2 Construction Quality Assurance Personnel Qualifications

The qualifications of the Construction Quality Assurance officer and supporting inspection personnel shall be presented in the CQAP to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

4.4.3 Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the remedial action shall be described in the CQAP. The plan shall include scope and frequency of each type of inspection. Inspections shall verify compliance with the design, applicable requirements of state and federal law and performance standards. Inspections shall also ensure compliance with all health and safety standards and procedures. The CQAP shall include provisions for conducting the preconstruction, prefinal and final inspections and associated meetings as described in Section 5.4 of this SOW.

4.4.4 Sampling Requirements

The sampling activities necessary to ensure that the design specifications and performance standards are achieved shall be presented in the CQAP. The description of these activities shall include sample sizes, sample locations, frequency of sampling, testing to be performed, acceptance and rejection criteria, and plans for correcting problems as addressed in the design specifications.

4.4.5 Documentation

Reporting requirements for CQA activities shall be described in detail in the CQAP. This shall include such items as daily summary reports, meeting reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports and final documentation. Provisions for the storage of all records shall be presented in the CQAP.

4.5 PERFORMANCE STANDARD VERIFICATION PLAN

A Performance Standard Verification Plan (PSVP) shall be prepared to consolidate information for required testing, sampling and analyses to ensure that both short-term and long-term performance standards for the RA are met. Performance standards may include clean-up standards for contaminated environmental media as well as the measurement of the effectiveness of engineering controls or other controls used to control migration of or exposure to contaminants. For example, the containment of a plume of contaminated ground water by pumping wells would be a performance standard requiring verification. The PSVP should describe the measurements to be taken, such as water levels in monitoring wells and piezometers, along with any analyses to be conducted on the data obtained, such as ground water modeling, to verify that the plume is contained. The PSVP shall include a FSP and a QAPP for any sampling and analyses to be conducted.

The Draft PSVP shall be submitted with the Intermediate Design for review and comment by the Ohio EPA. The final PSVP, which fully addresses comments made by the Ohio EPA must be submitted with and approved as part of the Final Design.

4.6 OPERATION AND MAINTENANCE PLAN

The Respondents shall prepare an Operation and Maintenance Plan (O&M Plan) to cover long-term operation and maintenance of the RA. Operation and maintenance for all components of the remedial action shall begin after it is demonstrated that those components are operational and functional. The plan, at a minimum, shall be composed of the elements listed below.

1. Normal Operation and Maintenance
 - a. Description of tasks for operation

- b. Description of tasks for maintenance
 - c. Description of prescribed treatment or operating conditions
 - d. Schedules showing the frequency of each O&M task
2. Potential Operating Problems
- a. Description and analysis of potential operating problems
 - b. Sources of information regarding potential operating problems
 - c. Description of means of detecting problems in the operating systems
 - d. Common remedies for operating problems
3. Routine Monitoring and Laboratory Testing
- a. Description of monitoring tasks
 - b. Description of required laboratory tests and interpretation of test results
 - c. Required QA/QC procedures to be followed
 - d. Schedule of monitoring frequency and provisions to discontinue, if appropriate
- Note: Information on monitoring and testing that is presented in the PSVP should be referenced, as appropriate, but should not be duplicated in the O&M Plan.
4. Alternative O&M
- a. Description of alternate procedures to prevent undue hazard, should systems fail
 - b. Analysis of the vulnerability and additional resources requirements should a failure occur
5. Safety Plan
- a. Description of safety procedures, necessary equipment, etc. for site personnel
 - b. Description of safety tasks required in the event of systems failure (may be linked to the Site Safety Plan developed for the RD/RA)
6. Equipment
- a. Description of equipment necessary to the O&M Plan
 - b. Description of installation of monitoring components
 - c. Description of maintenance of site equipment
 - d. Replacement schedule for equipment and installed components
7. Annual O&M Budget
- a. Costs for personnel
 - b. Costs for preventative and corrective maintenance
 - c. Costs of equipment and supplies, etc.
 - d. Costs of any contractual obligations (e.g., lab expenses)
 - e. Costs of operation (e.g., energy, other utilities, etc.)

8. Records and Reporting Mechanisms Required
 - a. Daily operating logs
 - b. Laboratory records
 - c. Records for operating costs
 - d. Mechanism for reporting emergencies
 - e. Personnel and maintenance records
 - f. Monthly/semi-annual reports to Ohio EPA

The Respondents shall submit a draft O&M Plan to the Ohio EPA for review and comment with the Intermediate Design submittal. Subsequent drafts of the O&M Plan shall be submitted with the Prefinal and Final Design submittals, which reflect the refined plans and specifications of those submittals and any comments made by the Ohio EPA. The final O&M Plan shall be submitted by the Respondents prior to or at the completion of construction of the remedial action and shall incorporate any modifications or corrections required by the Ohio EPA.

APPENDIX C

LIST OF GUIDANCE DOCUMENTS AND REFERENCES FOR USE WITH OHIO EPA DERR REMEDIAL RESPONSE PROGRAM REMEDIAL DESIGN/REMEDIAL ACTION STATEMENT OF WORK AND ORDERS

Statement of Purpose and Use of This Guidance Document List:

The purpose of this list of Ohio EPA and U.S. EPA policies, directives and guidance documents is to provide a reference of the primary documents which provide direction and guidance for designing and implementing selected remedial actions at Remedial Response sites. The listed documents incorporate by reference any documents listed therein. Certain sites may have contaminants or conditions which are not fully addressed by the documents in this list. There is an evolving body of policy directives, guidance and research documentation which should be used, as needed, to address circumstances not encompassed by the documents in this list. For sites where activities are conducted in response to an administrative or judicial order, this list will be an attachment to the order and will govern the work conducted. When entering into or issuing an order for any site, Ohio EPA reserves the right to modify this list to fully address the site conditions.

Analytical Methods

Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air, second edition, Compendium Method TO-14, EPA/625/R-96/010b, U.S. EPA, January 1999.

SW 846, Test Methods for Evaluating Solid Waste, 3rd Edition and updates (online), originally dated November 1986.

Standard Methods for the Examination of Water and Waste Water, American Public Health Association, 18th Edition 1992, and recent editions (online).

U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, U.S. EPA, EPA-540/R-94-013, February 1994.

U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, U.S. EPA, EPA-540/R-94-012, February 1994.

Data Quality Objectives

Data Quality Evaluation Statistical Toolbox (DataQUEST) Users Guide, U.S. EPA ORD, EPA/600/R-96/085 (EPA QA/G-9D), December 1997.

Data Quality Objectives Decision Error Feasibility Trials Software (DEFT) – Users Guide, U.S. EPA, EPA QA/G-4D, EPA/240/B-01/007, September 2001.

Data Quality Objectives Process for Hazardous Waste Site Investigations, U.S. EPA, EPA/600/R-00/007 (EPA QA/G-4HW), January 2000.

Data Quality Objectives Process for Superfund, Interim Final Guidance, OSWER Directive 9355.9-01, EPA540-R-93-071, September 1993.

Data Quality Objectives Process Summary, DERR-00-DI-32 Ohio EPA DERR Remedial Response Program, January 2002.

Guidance for Data Quality Assessment: Practical Methods for Data Analysis, U.S. EPA ORD, EPA/600/R-96/084 (EPA QA/G-9), January 1998.

Guidance on Systematic Planning Using the Data Quality Objectives Process, U.S. EPA, EPA QA/G-4, February 2006. EPA/240/B-06/001.

Health and Safety Plan

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ISBN: 1-882417-46-1, 2002.

NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985, DHHS (NIOSH) Publication No. 85-115.

NIOSH Pocket Guide to Chemical Hazards (DHHS-NIOSH Publication No. 2005-149, November 2005)

OSHA Regulations particularly in 29 CFR 1910 and 1926

OSHA Regulation 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response;

OSHA Regulation 29 CFR 1910.134, Respiratory Protection Standard;

Monitored Natural Attenuation

Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies, U.S. EPA, EPA/540/S-02/500, November 2002

Natural Attenuation for Groundwater Remediation, Committee on Intrinsic Remediation, National Academy of Sciences, 2000.

Performance Monitoring of MNA Remedies for VOCs in Ground Water, U.S. EPA, EPA/600/R-04/027, April 2004.

Remediation Using Monitored Natural Attenuation, Ohio EPA DERR Remedial Response Program, January 2001.

Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents In Ground Water, U.S. EPA, EPA/600/R-98/128, September 1998.

Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites, U.S. EPA, OSWER Directive 9200.4-17P, April 1999

Oversight

Interim Guidance on implementing the Superfund Administration Reform on PRP Oversight, U.S. EPA, OSWER Directive 9200.0-32P, May 2000.

Using RCRA's Results-Based Approaches and Tailored Oversight Guidance" when Performing Superfund PRP Oversight, U.S. EPA December 2006, OSWER, EPA 530-R-03-012, September 2003.

Presumptive Remedies

Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soil, U.S. EPA, OSWER 9355.4-048FS, September 1993.

Presumptive Remedy: Supplemental Bulletin Multi-Phase Extraction (MPE) Technology for VOCs in Soil and Groundwater, U.S. EPA, OSWER 9355.0-68F8, April 1997.

Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, U.S. EPA, EPA 540/R-96/023, OSWER 9283.1-12, October, 1996, final guidance.

Closure Criteria Focus Group Report, ITRC Work Group In Situ Bioremediation - Technologies Task Team, March 1998.

Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, OSWER, EPA-540-R-05-012, December 2005.

Cost & Performance Reporting for In-Situ Bioremediation Technologies, ITRC In Situ Bioremediation Technical Task Team, Final, December 1997.

Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents, ITRC Permeable Reactive Barriers Work Group, Second Edition, December 1999.

General Protocol for Demonstration of In Situ Bioremediation Technologies, ITRC Workgroup – In Situ Bioremediation Work Team, September 1998.

Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive 9355.4-01, EPA/540/G-90/007, August 1990.

Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites, U.S. EPA, EPA/600/2-85/028, March 1985 (Author: M.P. Esposito et al., hard copy/microfish available through NTIS/PB85-201234)

Guidance for Evaluating the Technical Impracticability of Ground Water Restoration, OSWER Directive 9234.2-25.

Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988.

Handbook - Dust Control at Hazardous Waste Sites, U.S. EPA, EPA/540/2-85/003, November 1985 (# 540285003).

Handbook for Stabilization/Solidification of Hazardous Wastes, U.S. EPA, EPA/540/2-86/001, June 1986 (# 540286001).

Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, U.S. EPA, EPA/625/6-89/019, January 1989 (# 625689019).

Technical Requirements for On-site Low Temperature Thermal Treatment of Non-Hazardous Soils Contaminated with Petroleum/Coal Tar/ Gas Plant Wastes, Interstate Technology Regulatory Council (ITRC) Low Temperature Thermal Desorption Work Team, Final, May 1996.

Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated with Hazardous Chlorinated Solvents Interstate Technology Regulatory Council (ITRC) Low Temperature Thermal Desorption Work Team, Final, September 1997.

Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated and Low Level Mixed Waste Contaminated with Mercury and/or Hazardous Chlorinated Organics, Interstate Technology Regulatory Council (ITRC) Low Temperature Thermal Desorption Work Team, Final, September 1998.

Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds, Ohio EPA Policy No. DSW-DEER 0100.027, Final, September 22, 1994.

Sampling and Analysis

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ATTACHMENT D

Land Use Restriction Agreement to Create and Equitable Servitude

LAND USE RESTRICTION AGREEMENT
TO CREATE AN EQUITABLE SERVITUDE

This Land Use Agreement to Create an Equitable Servitude, herein called "Agreement," is entered into by Howden Buffalo Inc., having offices at 338 South Broadway, New Philadelphia, Tuscarawas County, Ohio and herein called "Grantor," and the Ohio Environmental Protection Agency, herein called "Ohio EPA," this 7th day of November, 2003, at Columbus, State of Ohio. The land use restriction created herein touches and concerns an approximately seventeen (17) acre tract of real property with improvements, owned by Grantor and located at 338 South Broadway, New Philadelphia, Tuscarawas County, Ohio, herein called the "Subject Property," in that it is intended to limit the use of the Subject Property and restrict certain activities from occurring on the Subject Property.

It is the intent of the Grantor and Ohio EPA, herein collectively called the "Parties," that the covenants, terms, conditions and restrictions of this Agreement be binding upon, and inure to the benefit of, the Parties and continue as a servitude running in perpetuity, or until terminated or modified as provided herein, with the Subject Property. It is the further intention of the Parties that the land use restriction described herein be enforceable at law or in equity by Ohio EPA against Grantor for as long as Grantor shall own the Subject Property, any Transferee, as defined herein, and/or any other future owner of any interest in the Subject Property.

Grantor, Joy Technologies, Inc. (a former property owner) and Ohio EPA entered into Director's Final Findings and Orders, journalized on January 29, 2001, for the purpose of implementing the soil remedial alternative for the Subject Property, as described in the Decision Document, dated February 2000. The Decision Document, which is an enforceable part of the Director's Final Findings and Orders, includes a description of the use restrictions contained in this Agreement:

1. For purposes of this Agreement, Subject Property is defined as follows:

That property acquired by Grantor, as recorded in Deed Book Volume 716, Page 413 in the office of the County Recorder of Tuscarawas County and as more particularly described in Exhibit A, attached hereto.

2. Polychlorinated biphenyls ("PCBs") are present in concentrations that exceed residential risk-based cleanup goals set forth in the Decision Document, dated February 2000, in an area in the northwest corner of the Subject Property, herein called the "PCB Area." For purposes of this Agreement, the PCB Area is defined as follows:

An area of 0.110 acres, more or less, in the northwest corner of the Subject Property, as more particularly described in Exhibit B, attached hereto.

3. In consideration of the Grantor's use of an industrial land use restriction and prohibition against the installation of wells into groundwater and groundwater use as part of the remedial action for the Subject Property and PCB Area, Grantor agrees to impose and comply with the following restrictions on the Subject Property and the PCB Area and comply with the covenants, terms and conditions related thereto:
 - a. The Subject Property and the PCB Area shall only be used for industrial land use, as that term is defined in Ohio Administrative Code Section 3745-300-08 (B)(2)(c)(iii). No residential use of the Subject Property and/or the PCB Area shall be allowed.
 - b. The groundwater underlying all or any portion of the Subject Property and the PCB Area shall not be used for any purpose without Ohio EPA approval.
 - c. Groundwater wells, other than wells used for monitoring purposes, will not be installed in the Subject Property or in the PCB Area.
 - d. No digging or excavation shall occur in the PCB Area unless prior written approval has been provided by Ohio EPA.
4. The covenants, terms, conditions and restrictions of this instrument shall be binding upon, and inure to the benefit of, the Grantor and the State of Ohio and their successors in interest and assigns and any Transferee, and shall continue as a servitude running in perpetuity with the Subject Property and PCB Area, subject to termination and modification as described below. The term "Grantor," wherever used herein, shall include the persons and/or entities named at the beginning of this document, identified as "Grantor," and its successors in interest liable under Ohio law. The term "Transferee," wherever used herein, shall mean any future owner of any interest in the Subject Property and/or the PCB Area, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.
5. Within thirty (30) days after the execution of this Agreement by the Parties, Grantor shall record, in the office of the County Recorder of Tuscarawas County, in an instrument whose recording is provided for by law, this Agreement.
6. Within ten (10) days after recording the Agreement, as noted above, the Grantor shall certify to Ohio EPA that the Agreement has been filed for recording, and include with the certification a file and date stamped copy of the land use restriction.
7. The Grantor or a Transferee may request written approval for a use of the Subject Property or the PCB Area which is not specifically permitted by this Agreement by submitting a written petition, via certified mail, to the director of Ohio EPA for termination or

modification of this Agreement. Any such request which constitutes a change in the specific prohibition may only be granted by the director of Ohio EPA, based on the standard described below. In such event, the petition for modification or termination shall state the specific provision(s) sought to be modified or terminated and shall further include evidence demonstrating that one or more of the following conditions have been met:

- a. the prohibition against the use of groundwater and the drilling of wells in groundwater may be terminated when the cleanup goals for groundwater set forth in Table 6 of the Decision Document, dated February 2000, have been met.
 - b. the limitation of the Subject Property to industrial use may be terminated, except for the PCB Area, when the residential risk-based cleanup goals for volatile organic compounds (VOCs) set forth in Table 7 of the Decision Document have been met.
 - c. the prohibition against digging or excavation in the PCB Area and its limitation to industrial use may be terminated if remedial action is taken to reduce the risk associated with the PCB contamination to acceptable levels.
8. The petition for termination or modification of this Agreement will be considered by the director of Ohio EPA only when it presents new and relevant information not previously considered prior to entering into this Agreement. The director of Ohio EPA will issue a determination based upon the criteria set forth in paragraph 7 above.
9. The Grantor shall be considered in violation of the Director's Final Findings and Orders entered into with Ohio EPA and Joy Technologies, Inc. and journalized on January 29, 2001, if this Agreement is violated or breached by Grantor. For violation or breach of this Agreement or any terms or conditions of the land use restrictions by Grantor or any Transferee, the director of Ohio EPA shall have the right to proceed at law or in equity to compel compliance with the terms hereof or to obtain injunctive relief in order to prevent violation or breach of this Agreement. Failure to timely enforce the foregoing covenant and use restriction by any party shall not bar subsequent enforcement by such party and shall in no manner be deemed a waiver.
10. Grantor agrees to include in any instrument conveying any interest in any portion of the Subject Property or the PCB Area, including but not limited to deeds, leases and mortgages, a notice which is in substantially the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO A LAND USE RESTRICTION AGREEMENT, DATED _____, 2003, RECORDED IN THE PUBLIC LAND RECORDS ON _____, 200__, IN BOOK _____, PAGE _____, IN FAVOR OF, AND ENFORCEABLE BY, THE STATE OF OHIO. THE SUBJECT PROPERTY AND THE PCB AREA SHALL ONLY BE USED FOR INDUSTRIAL LAND USE, AS THAT TERM IS DEFINED IN OHIO ADMINISTRATIVE CODE SECTION 3745-300-08 (B)(2) (c)(iii). NO RESIDENTIAL USE OF THE SUBJECT PROPERTY AND/OR THE PCB AREA SHALL BE ALLOWED. THE GROUNDWATER UNDERLYING ALL OR ANY PORTION OF THE SUBJECT PROPERTY AND THE PCB AREA SHALL NOT BE USED FOR POTABLE PURPOSES. GROUNDWATER WELLS, OTHER THAN WELLS USED FOR MONITORING PURPOSES, WILL NOT BE INSTALLED IN THE SUBJECT PROPERTY OR IN THE PCB AREA. NO DIGGING OR EXCAVATION SHALL OCCUR IN THE PCB AREA UNLESS PRIOR WRITTEN APPROVAL HAS BEEN PROVIDED BY OHIO EPA.

Within ten (10) days after the date any such instrument of conveyance is executed, Grantor must provide the director of Ohio EPA with a certified true copy of said instrument and, if it has been recorded in the public land records, its recording reference.

11. Prior to executing any instrument conveying any interest in any portion of the Subject Property and/or the PCB Area, including but not limited to easements, deeds, leases and mortgages, Grantor shall notify the Transferee of the existence of the land use restrictions by providing a copy of this Agreement to the Transferee.
12. Grantor hereby covenants to and with the State of Ohio that the Grantor is lawfully seized in fee simple of the Subject Property and the PCB Area, that the Grantor has a good and lawful right and power to sell and convey them and any interest therein, that the Subject Property and PCB Area are free and clear of encumbrances, and that the Grantor will forever warrant and defend the title thereto and the quiet possession thereof.

