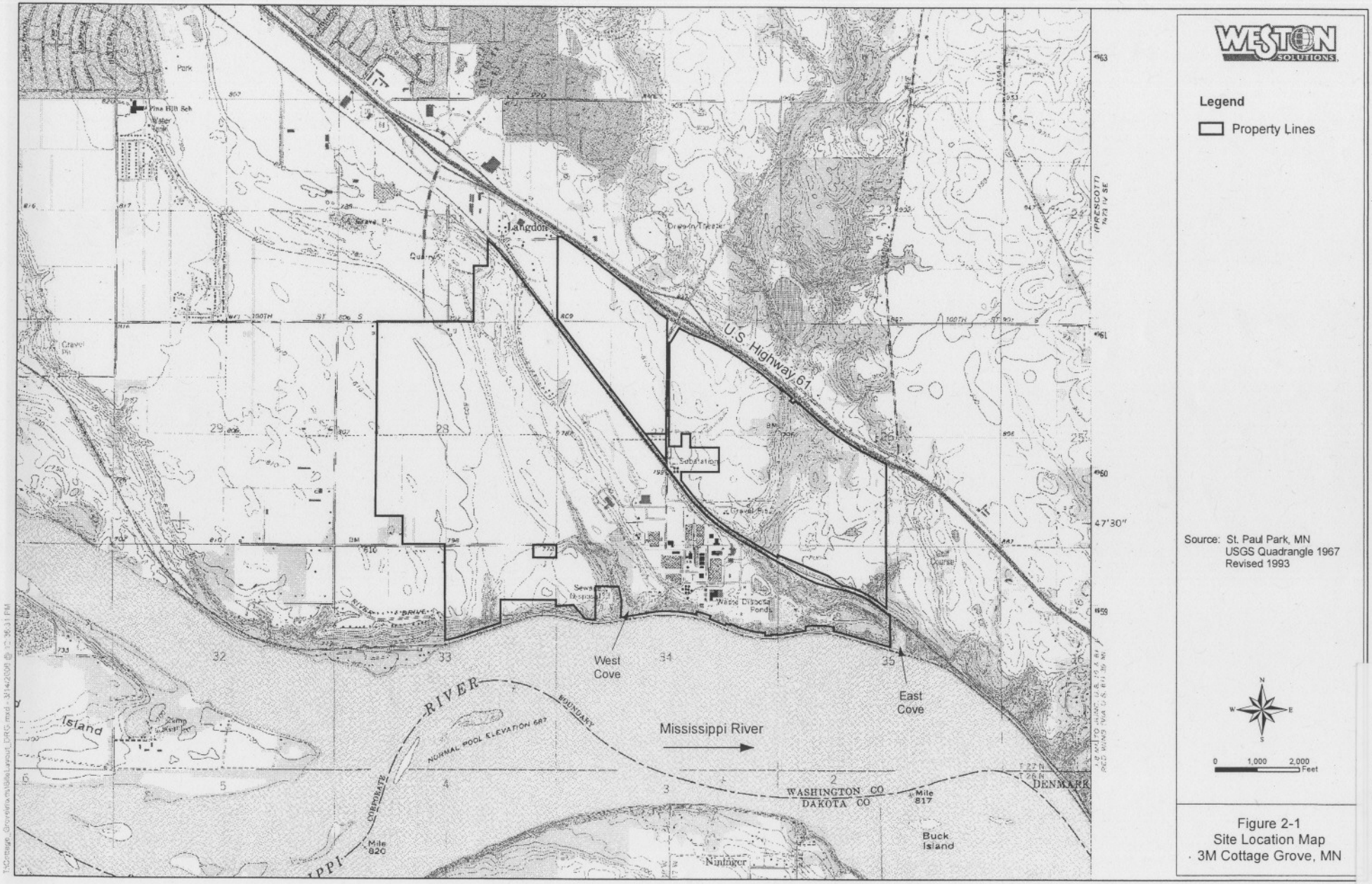

Figure 2-1
Site Location Map
3M Cottage Grove, MN

ATTACHMENT 1

ATTACHMENT 2

STATE OF MINNESOTA
COUNTY OF RAMSEY

MINNESOTA POLLUTION CONTROL AGENCY

In the Matter of the
3M Chemolite Disposal Site
(also known as 3M Cottage Grove)
Cottage Grove, Washington County, Minnesota
under the Minnesota Environmental
Response and Liability Act,
Minn. Stat. §§ 115B.01-115B.24

REQUEST FOR RESPONSE ACTION

To: 3M Company (3M) (formerly known as Minnesota Mining and Manufacturing)

I. NOTIFICATION OF OBLIGATION TO TAKE RESPONSE ACTION

A. This document is issued by the Minnesota Pollution Control Agency (MPCA) and constitutes a Request for Response Action (RFRA), as authorized by Minn. Stat. §§ 115B.17 and 115B.18.

B. YOU ARE HEREBY NOTIFIED that the MPCA has made the following determinations:

1. The 3M Chemolite Disposal Site (Site) located in Cottage Grove, Washington County, Minnesota, is the location of a release or threatened of hazardous substances or pollutants or contaminants and constitutes a facility[1] within the meaning of Minn. Stat. § 115B.02, subd. 5(3);

2. There have been one or more releases at or from the Site within the meaning of Minn. Stat. § 115B.02, subd. 15 and continue to be releases and threatened releases of hazardous substances or pollutants or contaminants;

3. The substances released are hazardous substances within the meaning of Minn. Stat. § 115B.02, subd. 8;

4. The releases and threatened releases are from the facility;

5. With respect to these releases and threatened releases, 3M Company is a responsible person within the meaning of Minn. Stat**.** § 115B.03, subds. 1(1) and 3(1).

[1] Terms used in the RFRA and the Exhibits to the RFRA are defined in Attachment 3 to the Board Item prepared for the issuance of the RFRA.

6. The actions requested in the RFRA are reasonable and necessary to protect the public health or welfare or the environment; and

7. The schedule for beginning and completing the requested actions in this RFRA is reasonable.

C. Having made these determinations, the MPCA formally requests that 3M Company take the response actions described in Section III of this RFRA. A timetable for beginning and completing the actions is established in Section IV. The reasons for the requested actions are set out in Section II. Section V describes the intention of the MPCA to take action if 3M fails to take the requested response action within the timetable established in Section IV. Section V also describes the consequences of failure to satisfactorily respond to the RFRA. Cost reimbursement obligations are described in Section VI.

D. 3M must notify the MPCA staff in writing by May 15, 2007 of its intentions to undertake the response actions requested in the RFRA. Failure by 3M to notify the MPCA staff by May 15, 2007 of its intentions to undertake the response actions, may result in a determination by the MPCA under Minn. Stat. § 115B.17, subd. 1(a)(3) that the actions requested will not be taken in the manner and within the time requested.

Notification of the intent should be sent to Gary L. Krueger, Superfund and Emergency Response Section, Remediation Division, Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, Minnesota, 55155, telephone number (651) 296-6139.

E. If 3M fails to take the requested actions in the manner and within the time set forth in this RFRA, the MPCA may proceed to make a Determination That Actions Will Not Be Taken in the Manner and Time Requested. Upon making such a determination, the MPCA may authorize litigation to require 3M to take necessary response actions and/or reimburse the state for costs incurred if the state elects to implement response actions. These steps are described more fully in Section V.

II. REASONS FOR THE REQUESTED ACTION

Samples of soil, ground water, surface water, sediment at the Site indicate that releases of perfluorochemicals (PFCs) constituting hazardous substances PFOA and PFOS, specifically perfluorooctanoic acid (PFOA) and perfluorooctanesulfanate (PFOS), have occurred at the Site. The Site meets the definition of a “facility” and is the source of releases or threatened releases of hazardous substances or pollutants or contaminants.

The 3M Chemolite Disposal Site has been the subject of previous environmental investigations and response actions to address releases and threatened releases of hazardous substances other than PFOA and PFOS. MPCA and 3M entered a Consent Order on May 30, 1985 with respect to these releases and threatened releases. Because MPCA had no knowledge of the release or threatened release of PFOA and PFOS at the time the Consent Order was entered, the Consent Order does not apply to releases or threatened releases of PFOA AND PFOS at the 3M Chemolite Disposal Site**.** At the request of MPCA staff, 3M has taken certain actions with respect to releases and threatened releases of PFOA and PFOS at the Site since August 12, 2003.

Additional investigation is needed to evaluate, select, design and implement additional response actions to address the release and threatened release of PFOA or PFOS at and from the Site. The requested actions set forth in Sections III and IV will provide additional information necessary to fully evaluate, select and design appropriate response actions and will provide for the implementation of reasonable and necessary response actions to minimize, abate, control or prevent releases and threatened releases of PFOA and PFOS at the Site.

III. REQUESTED RESPONSE ACTIONS

The MPCA has determined (1) that the actions specified in this Section III constitute removal or remedial actions (response actions) within the meaning of Minn. Stat. § 115B.02, subds. 16, 17 and 18 and (2) that these response actions are reasonable and necessary to protect the public health, welfare or the environment. Consequently, the MPCA hereby formally requests that 3M Company take the response actions within the timetables established in Section IV.

The MPCA's purpose in issuing this RFRA is to expedite the implementation of response actions at the Site. The criteria for selecting the response actions to be implemented at the Site are specified in Parts IV.C. of Exhibit A to this RFRA.

All work plans, reports, or other documents to be submitted by 3M under this RFRA (submittals) are subject to review and approval by the MPCA in accordance with Exhibit A, Part IV.B and Exhibit B, Part V.A .

A. Remedial Investigations and Feasibility Studies

The purpose of a Remedial Investigation and Feasibility Study (RI/FS) is to provide sufficient information to understand the scope and extent of the releases and threatened releases at and from the Site and to evaluate the feasibility and effectiveness of alternative response actions to protect public health and welfare and the environment with respect to the releases and threatened releases. The requirements of the RI/FS are described in Exhibit A to this RFRA. Exhibit A is appended to and made an integral part of this RFRA

B. Response Action Design and Implementation Plans

The purpose of a Remedial Design and Remedial Action Plan (RD/RAP) is to provide a detailed design and an implementation plan for the selected response actions which, upon implementation, will protect the public health and welfare and the environment from the release and threatened release of hazardous substances or pollutants or contaminants associated with the Site. The requirements of the RD/RAP and response action implementation are described in Exhibit B to this RFRA. Exhibit B is appended to and made an integral part of this RFRA.

The response actions requested in this RFRA shall assure that public health is protected with respect to public and/or private drinking water supplies affected by releases of PFOA and PFOS from this Site, and include actions to prevent additional or future releases affecting drinking water supplies, and to provide alternate drinking water supplies or appropriate treatment of drinking water supplies to assure that drinking water affected by these releases meets relevant MDH health-based standards.

C. Reports

The MPCA Commissioner shall be provided with Quarterly progress reports due by the fifteenth day after the last month in each respective quarter. The progress reports shall describe activities conducted pursuant to this RFRA, and results of sample analyses, tests and other data gathered or received, during the preceding three months and activities planned for the next quarter.

Within thirty (30) calendar days of the effective date of this RFRA and quarterly thereafter unless otherwise advised by the Project Manager, Gary L. Krueger shall submit to the MPCA Commissioner a quarterly summary report detailing all activities conducted pursuant to this RFRA, and results of sample analyses, tests and other data gathered or received, during the preceding quarter and activities planned for the next quarter.

The progress reports shall be addressed to:

Gary L. Krueger, Project Manager
Minnesota Pollution Control Agency
Superfund and Emergency Response Section
Remediation Division
St. Paul, Minnesota 55155

D. Data and Document Availability and Retention

3M shall permit the MPCA staff and/or its authorized representatives to inspect and copy all sampling, testing, monitoring, or other data transmitted to or generated by 3M pertaining to work undertaken pursuant to this RFRA. 3M shall allow duplicate/split samples to be collected by the MPCA staff and/or its authorized representatives, of any samples collected by 3M pursuant to this RFRA. 3M shall maintain a central repository of the data, reports and other documents prepared pursuant to this RFRA. All data, reports and other documents prepared pursuant to this RFRA or related to the release or threatened release of PFCs at or from the Site shall be preserved by 3M until 3M is notified otherwise by the MPCA .

E. Actions to Address Other PFCs

If, during implementation of response actions pursuant to this RFRA, the Commissioner, after consultation with Minnesota Department of Health, believes that a release or threatened release of any PFC other than PFOA and PFOS (including a release of multiple PFCs), at or from the Site meets the requirements for taking action under MERLA, the Commissioner will notify 3M of his intent to amend the RFRA to address the release or threatened release. The Commissioner will also give notice to the Board and to any persons who have requested notice of MPCA actions regarding the Site. The Commissioner will provide a reasonable period for comment on the proposed RFRA amendment. After considering any timely comments, and unless the matter has been referred to the Board for a decision, the Commissioner may amend the RFRA to address the release or threatened release.

IV. TIMETABLE FOR COMPLETING THE REQUESTED ACTIONS

The MPCA has determined that the following timetable is necessary and reasonable. The timetable refers to specific elements of Exhibits A and B to this RFRA. Unless otherwise specified, “days” means calendar days.

Notice of Intent to Comply	May 15, 2007
Submit RI Report	June 30, 2007
Initiate Interim Response Actions (if appropriate)	Within 30 days of Commissioner’s approval of interim response action plan
Submit FS Report	Within 60 days of Notification of MPCA Commissioner’s approval of RI Report

MPCA Commissioner Issues Minnesota Decision Document	
Retain Consultant to Complete the Requirements of Exhibit B	Within 30 days of Commissioner's approval of the FS Report
Submit RD/RA Work Plan	Within 90 days of Notification of MPCA Commissioner's approval of FS Report
Initiate RA	Within 30 days of Notification of MPCA Commissioner's approval of RD/RA Work Plan
Report Results of RA Implementation	Within 60 days of completion by the MPCA Commissioner that all of the RA objectives and cleanup levels have been met

3M shall promptly notify the MPCA of any anticipated or actual failure to comply with the dates or other terms of this RFRA. Such notice shall include the reasons for the noncompliance and steps proposed for a return to compliance or alternative actions proposed to comply with the intent of this RFRA. The MPCA may accept or modify the proposed alternative actions if the MPCA determines that such measures are adequate and that the need for the modification is not a result of failures within the control of 3M. The MPCA may grant extensions of the time schedules set forth in this RFRA in the event that 3M submits a written request for the extension before the deadline for which the extension is sought, and demonstrates to the MPCA good cause for granting the extension.

V. MPCA'S INTENTION TO TAKE ACTION AND CONSEQUENCES OF RESPONSIBLE PERSON'S FAILURE TO TAKE REQUESTED ACTION

A. YOU ARE HEREBY NOTIFIED that under the Minnesota Environmental Response and Liability Act, if a responsible person fails to take the actions requested in this RFRA in an adequate or timely fashion, the responsible person may be subject to the following actions:

1. the MPCA may undertake or complete the requested response actions and seek recovery from the responsible person for all costs associated with such action; or

2. the responsible person may be subject to an action to compel performance of the requested response actions or for injunctive relief to enjoin the release or threatened release.

In either case, a responsible person who fails to take the response actions requested by the MPCA in an adequate and timely fashion may be subject to civil penalties in an amount to be determined by the court of up to $20,000 per day for each day that the responsible person fails to take reasonable and necessary response actions.

B. YOU ARE HEREBY FURTHER NOTIFIED that if you fail to take the requested response actions, the MPCA intends to take one or more of the actions specified in Parts V. A.

VI. REQUIREMENT TO REIMBURSE THE MPCA

YOU ARE HEREBY FURTHER NOTIFIED that the responsible person, whether or not they complete the requested response action, may be required to:

A. reimburse the MPCA for all reasonable and necessary expenses it incurs, including all response costs, and administrative and legal expenses in the investigation and/or cleanup of the release; and

B. pay damages for any injury to or loss of natural resources resulting from the release of a hazardous substance, pollutant or contaminant.

IT IS SO ORDERED

_____
Commissioner Brad Moore
Chair, Citizens' Board
Minnesota Pollution Control Agency

_____
Date

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Exhibit A
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

I. INTRODUCTION, PURPOSE, AND REQUIREMENTS

I.A. Introduction

Part III.A of the Request for Response Action (RFRA), to which this Exhibit is appended, requests the Responsible Party (RP) to conduct a Remedial Investigation/Feasibility Study (RI/FS) with respect to release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the 3M Chemolite Disposal site (Site). This Exhibit sets forth the requirements for completing the RI/FS and is appended to and made an integral part of the RFRA. Terms used in this Exhibit are defined in Attachment I to the RFRA.

I.B. Purpose

The purpose of conducting an RI/FS is to provide information necessary to enable the Minnesota Pollution Control Agency (MPCA) Commissioner to select a final remedy for the Site.

In order to arrive at remedy selection in the most expedient manner, the RI and FS activities will be conducted concurrently. The RI/FS Work Plan shall propose:

- the RI activities; and
- a list of possible remedial technology types.

The RI Report shall:

- report the results of the RI; and
- document the development and screening of possible response action alternatives.

The FS Report shall present:

- the results of treatability studies; and
- the Detailed Analysis Report (DAR).

I.B.1. Remedial Investigation. The RI activities will (1) provide for the complete characterization of the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the Site and the actual or potential hazard the release(s) or threatened release(s) pose to public health and welfare, and the environment; (2) produce sufficient data and information to allow the RP to submit the RI and FS reports (Part III.E and III.F); and (3) produce data of sufficient quantity and adequate technical content to assess the possible alternative response actions during the FS.

I.B.2. Feasibility Study. The FS activities consist of developing a list of technology types, development and screening of possible response action alternatives, preparing and conducting treatability studies, and conducting a detailed analysis of evaluated alternatives. The MPCA Commissioner will review the FS Report and select the final response action(s) using the Selection of Remedy Criteria set forth in Part IV.C. of this Exhibit.

I.C. Requirements

The RI/FS shall be conducted according to the provisions of this Exhibit. The United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (October 1988 Interim Final) will provide the RP with specific guidance for completing the actions required under this Exhibit to the extent that this guidance is consistent with the requirements of this Exhibit. The sampling and quality assurance activities (Part III.C.3) shall be consistent with the requirements of the USEPA Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80). Risk assessments (i.e., evaluation, quantitation, tabulation of results, and mechanics of presentation) performed under this Exhibit (Part III.C.6.) shall be based on appropriate MPCA requirements, USEPA's "The Risk Assessment Guidelines of 1986" (EPA/600/8-87/045), "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Pt. A, December 1989, Interim Final) and the USEPA Risk Assessment Guidance for Superfund, Vol. 2, Environmental Evaluation Manual (March 1989, Interim Final).

At a minimum, the Site Security and Safety Plan (Part III.C.8) shall incorporate and be consistent with the requirements of:

- OSHA requirements 29 CFR Part 1910.120, Hazardous Waste Operations and Emergency Response;
- OSHA requirements 29 CFR Part 1910 (General Industry Standards) and 1926 (Construction Industry Standards);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/USCG/EPA, DHHS (NIOSH) Publication Number 85-115, October 1985.

As new versions or future revisions of the documents referenced in this section become available to the public, the latest version of each document shall supersede all previous versions of that document and shall be used for conducting the RI/FS.

II. RETAIN CONSULTANT

Within thirty (30) days of the effective date of the RFRA, the RP shall retain a consultant qualified to undertake and complete the requirements of this Exhibit and shall notify the MPCA Project Manager of the name of that consultant.

III. REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

III.A. RI/FS Objectives

The objectives of the RI/FS are to:

- identify all sources of contamination;
- evaluate the nature and extent of soil, sediment, surface water, ground water, and air contamination at the Site and in any adjacent areas affected by contamination at or from the Site;
- identify all existing and potential migration characteristics and pathways for the hazardous substances or pollutants or contaminants identified at the Site, including the direction, rate, and dispersion of contaminant migration;
- identify alternative response actions and evaluate the feasibility and effectiveness of implementing those alternative response actions to prevent, minimize, or eliminate

release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the Site; and

- collect and evaluate the information necessary to prepare a remedial design/response action plan in accordance with Exhibit B to the RFRA.

III.B. RI/FS Work Plan Submittal

Within ninety (90) days of the effective date of the RFRA, the RP shall submit to the MPCA Commissioner for approval pursuant to Part IV.B. and IV.B.1. of this Exhibit, a proposed RI/FS Work Plan and implementation schedule which details all of the activities necessary to complete the RI/FS. The proposed RI/FS Work Plan shall be prepared to enable the RP to meet the RI/FS Objectives (Part III.A) and shall, at a minimum, address all of the elements described in the RI/FS Work Plan Contents (Part III.C.).

III.C. RI/FS Work Plan Contents

The proposed RI/FS Work Plan shall address, at a minimum, each of the following elements:

III.C.1. Project Management. A Project Management section of the RI/FS Work Plan shall describe how the RI/FS will be managed by the RP and its contractors, subcontractors, and consultants. This section shall include an organization chart with the names and titles of key personnel and a description of their individual responsibilities.

III.C.2. Background Evaluation. The RI/FS Work Plan shall include a Background Evaluation that includes these sections: Operational History, Topographic Survey, History of Site Assessment Work and Remedial or Removal Actions, and Identification of Data Gaps.

III.C.2.a. Operational History of The Site. This section shall include a detailed explanation of the operational history of the Site (i.e., all past facilities and a description of their specific operations), including history of property ownership boundaries, and pertinent area and boundary features of the Site. In addition, this section shall include the following detailed information related to the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at the Site:

- a list of the hazardous substances or pollutants or contaminants that have been stored, used, treated, or disposed of on-Site and their estimated volumes, concentrations, and characteristics;
- a description of what, where, when, how and by whom hazardous substances or pollutants or contaminants were released during the operation of all facilities of record at the Site (e.g., Provide an explanation of how the Site or a specific area became contaminated.);
- a description of contaminant source areas and facilities which release or threaten the release of hazardous substances or pollutants or contaminants to soil, sediment, surface water, ground water, or air;
- a Site map delineating each area where such hazardous substances or pollutants or contaminants were disposed, treated, stored, transferred, handled, or used;
- a description of all industrial processes which are or were related to the use or generation of each hazardous substance or pollutant or contaminant; and
- a description of past disposal practices for hazardous substances or pollutants or contaminants.

Any historical research needs that have not been met by file review may be met by conducting employee interviews, reviews of the RP's records, and aerial photograph investigations.

III.C.2.b. Topographic Survey. This section shall include a description of the general physiography of the Site and surrounding area and one (1) Site map using a one (1) inch = 1000 feet scale and ten (10) foot contour interval.

Additional maps for each identifiable contaminant source area shall be provided using a one (1) inch = 50 feet scale and a two (2) foot contour interval. Surface water features, drainage direction, buildings, process areas, storage tanks, well locations, forested areas, utilities, paved areas, easements, rights-of-way, pipelines (surface and subsurface), landfills, borrow pits, debris piles, raw material piles, and impoundments shall be shown. The maps shall be of sufficient detail and accuracy to locate all current or proposed future work at the Site.

III.C.2.c. History of Site Assessment Work and Remedial or Removal Actions. This section shall include a history of all previous investigation(s) and response action(s) conducted at the Site including:

- a detailed description of regional and local hydrogeology and geology based on published literature and available technical information. Cross Sections and maps shall be included. Include the type and extent of surface soils as presented in the Soil Conservation Service soil surveys;
- a summary of all soil, surface water, ground water, and air assessment work completed to date, including contaminant source area identification, data reduction and interpretation, and the QA/QC procedures which were followed;
- a description of the nature and extent of the release(s) and/or threatened release(s), including a summary of actual and potential on-Site and off-Site health and/or environmental effects; and
- a summary of any previous remedial or removal actions conducted at the Site. This summary shall include cleanup activities and any related field inspections, sampling surveys, or other related ;
- technical investigations.

III.C.2.d. Identification of Data Gaps. Gaps in information (data gaps) necessary to fulfill the RI/FS Objectives (Part III.A) shall be identified and recommendations shall be made for additional RI work necessary to meet the RI/FS Objectives and produce sufficient information to support the screening and detailed analysis of response action alternatives in the RI/FS. For each data gap identified, the RP shall provide a list and description of research and field activities necessary to address that data gap.

III.C.3. Sampling and Investigations. The RI/FS Work Plan shall propose activities and methodologies necessary to conduct the investigations specified in Parts III.C.3.c, d, e and f, III.C.6. and propose the plans specified in Parts III.C.3.a and b.

III.C.3.a. Sampling and Analysis Plan. A comprehensive sampling and analysis plan shall be proposed for the investigations required under Parts III.C.3.c, d, e, and f, and III.C.6 below. This plan shall include:

- objectives of the sampling investigation;
- criteria for sampling location selection;
- a map showing all locations that will be sampled;
- a description of the types of samples which will be collected;
- a description of the depth/frequency of sampling at each location;
- a proposed sampling schedule;
- identification of all chemical parameters to be analyzed (analytes), selection rationale, and a corresponding list of chemical analytical methodologies (including USEPA or Standard Method numbers and detection limits) to be performed. Prior to determining a

final analyte list, analytes of concern should be separated into carcinogens and non-carcinogens. In addition, representative ground water samples shall be analyzed to identify natural chemical constituents that may affect various treatment methods or that may identify upgradient sources of contamination;

- abiotic and biotic environmental sampling shall be proposed to complete the assessment process required under Part III.C.6. The technical specifications and procedures for soil sampling methods, drilling methods, borehole and surface geophysical methods, and monitoring well and piezometer installations. ASTM procedures shall be used and referenced where appropriate and available;
- provisions for obtaining access to and obtaining samples from the Site and other affected properties (where appropriate);
- a description of quality assurance/quality control procedures for the collection, identification, preservation, holding times, and transportation of samples; type and volume of sample containers;
- the calibration and maintenance of field instruments; decontamination of sampling equipment; and the processing, verification, storage, calculations and statistics, and reporting of field data including field chain-of-custody procedures, identification of qualified persons conducting the sampling, and identification of a laboratory meeting the requirements of Part III.C.3.b.; and
- a description of any computer models to be employed in data analysis. Model descriptions shall include capabilities and limitations, all assumptions or approximations that will be made in calibrating and using the model, specific objectives to be achieved with the model, and justification for use of the model method including a discussion of why the model is the preferred model or method for meeting the objectives stated in the RI/FS Work Plan. The quantities or values that are desired from the model that are not confirmed by direct measurement shall be identified and the sensitivity of the model results to input parameters discussed. All data and programming including any proprietary programs shall be made available to the MPCA staff upon request.

III.C.3.b. Laboratory QA/QC Plan. The RI/FS Work Plan shall include a laboratory QA/QC plan which shall consist of the following sections:

- identification of laboratories performing analysis;
- description of laboratory sample chain of custody procedures;
- description of calibration procedures and frequency;
- description of analytical standard operating procedures;
- description of data reduction, validation, and reporting procedures;
- description of internal quality control checks;
- description of performance and system audits;
- description of preventative maintenance procedures;
- description of specific procedures for routine assessment of data precision, accuracy, completeness, and any necessary corrective action; and
- description of quality assurance reports to management.

Refer to EPA QA/QC guidance, which is available through the internet, at http://es.epa.gov/ncer/guidance/qa.html

III.C.3.c. Geologic Investigation. This section of the RI/FS Work Plan shall provide a description of the proposed activities which will be undertaken to characterize the geology and contaminant distribution at the Site and other affected properties. The geologic investigation shall be conducted in areas of known and suspected disposal and in areas where ground water contamination exists and no known or suspected contaminant source area has been identified. This section shall include the following:

- a proposal to define the stratigraphy of the consolidated and unconsolidated deposits including the identification of high or low permeability lenses of material in the unsaturated (vadose) zone which may affect contaminant migration or the attenuation of contaminants. This proposal shall also include the extent and type of lithologies of respective consolidated units and unconsolidated materials including relative amounts of organic matter, gravel, sand, silt, and clay according to ASTM soils classification scheme or other acceptable standard procedures;
- proposed tests to define the physical and chemical properties which affect the movement or attenuation of contaminants in the stratigraphic units identified above. These properties include: density, organic matter content, cation exchange capacity, percent clay content, vertical hydraulic conductivity, total porosity, effective porosity, and adsorption potential (Kd). See the soil cleanup guidance for additional parameters.
- proposed methods to define the nature and extent of contamination in the vadose zone;
- a proposal to identify areas disturbed by excavations or other activities that may be routes of contaminant migration (e.g., buried pipes, utility corridors, fill areas, tank basins); and
- a proposal to identify ambient concentrations of analytes in the soil.

III.C.3.d. Hydrogeologic Investigation. This section of the proposed RI/FS Work Plan shall provide a description of activities to be undertaken to characterize the local and regional hydrogeology and the contaminant distribution in the ground water at the Site and other affected properties. This section shall include the following:

- a proposal to identify Quaternary (glacial) and bedrock aquifers, aquitards, and perched water zones;
- a proposal for the installation and development of ground water monitoring wells and/or piezometers or other devices needed to clearly define ground water flow conditions in the glacial and bedrock aquifers, aquitards, and perched water zones. All wells shall be surveyed to the National Geodetic Vertical Datum reference elevation, and procedures shall be specified for measuring water elevations in all wells to the nearest hundredth of a foot;
- a proposal for the installation of ground water monitoring wells which shall be used to define ground water quality upgradient, within, and downgradient of suspected and/or identified contaminant source areas and at the interface between ground water and surface water;
- a proposal for a ground water quality monitoring program to be conducted to define the nature and extent of ground water contamination at the Site and other affected properties. Municipal, industrial, agricultural, domestic and monitoring wells, and springs shall be considered for inclusion in the monitoring program. The monitoring program shall have a minimum frequency of quarterly sampling with water level measurements;

- proposed tests (e.g., slug and/or pumping tests to determine the hydraulic properties, including horizontal hydraulic conductivity and secondary porosity, of aquifers and aquitards at the Site and other affected properties) which shall define ground water flow relationships (directions, gradients, and velocities for both vertical and horizontal flow components) including potential aquifer interconnections, recharge areas, discharge areas, and ground water interactions with surface water. In addition, this section shall propose how the flow relationships will be evaluated with respect to contaminant distribution and the potential future movement of contaminants;
- a proposal to define ground water use(s) and the potential effect water use(s) may have on contaminant movement in both horizontal and vertical directions. Include with this proposal an inventory map showing all active, unused, and abandoned municipal, industrial, agricultural, domestic and monitoring wells, and springs within a one mile radius of the Site, and of high capacity wells and municipal water supply wells within a three mile radius of the Site; and
- a description of visual aids which will be used to present, in the RI Report, the hydrogeologic and hydrogeochemical data gathered during the Hydrogeologic Investigation (e.g., cross sections, piezometric maps, isoconcentration maps, graphical methods, and tables).

III.C.3.e. Surface Water Investigation. This section of the RI/FS Work Plan shall identify all surface water bodies within a one mile radius of the Site including rivers, lakes, ponds, wetlands, bogs, calcareous fens, low-flow streams, creeks, springs, and named and unnamed ditches. Both perennial and intermittent surface water features shall be identified. A map showing the locations of all identified surface water bodies and the location of known or suspected releases of contaminants from the Site to surface water bodies shall be included. This section shall include a proposal to evaluate each surface water body identified, evaluate its potential to be impacted by Site contaminants through releases via ground water, surface run-off, drainage, airborne deposition, and other possible pathways. This proposal shall include a plan to identify the benthic sediments and benthic and other aquatic community conditions underlying and within surface water upgradient, adjacent to, and downgradient of the contaminant source area. In addition, methodologies shall be proposed to determine the mass loading of contaminants to the surface water bodies.

The water use classification for the identified surface water body or bodies, in accordance with Minn. R. ch. 7050 and the wetlands classification in accordance with Minn. Stat. §§ 103G.005, subds. 15 and 18 and 103G.201 (1988), shall be included. Identification of the water use characteristics (e.g., agricultural, recreational, and private or municipal water supply) of the identified surface water bodies shall also be included.

III.C.3.f. Air Investigation. This section of the RI/FS Work Plan shall propose methodologies for investigations to determine the nature and extent of contaminants that are or may become airborne (e.g., vapors, gases, mists, or particulates) through either natural phenomenon or as a result of activities at the Site.

III.C.4. List of Possible Technology Types and Proposed Treatability Studies. The RI/FS Work Plan shall include a comprehensive list of technology types that may be applicable to the release(s) or threatened release(s) at or from the Site. This list shall be developed considering the Remedy Selection Criteria (Part IV.C.). This list shall include: 1) technology types that prevent or eliminate the release(s) or threatened release(s) by completely destroying, detoxifying, or immobilizing hazardous substances or pollutants or contaminants and leave materials on-Site that require no long-term management; 2) technology types that prevent or minimize the release(s) or threatened release(s) by treatment process options that reduce the

toxicity, mobility, or volume of the hazardous substances or pollutants or contaminants; 3) technology types that control the threats posed by the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants by containment; and 4) a general description of the treatability studies necessary to evaluate the respective technology types identified under 1, 2 or 3 above. At a minimum, excavation and capping remedies for soils and extraction wells with treatment by activated carbon or anionic resin filtration remedies for ground water shall be considered.

III.C.5. Record Retention. The RI/FS Work Plan shall provide a description of how the data obtained pursuant to this Exhibit will be managed and preserved by the RP in accordance with Part II.D of the RFRA.

III.C.6. Risk Assessment[1]. The RI/FS Work Plan shall provide a detailed description of activities that will be undertaken to conduct separate ecological and human health Baseline Risk Assessments. Ecological and human health Baseline Risk Assessments are evaluations of the actual and potential threat to public health and welfare, and the environment posed by the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants, in the absence of any remedial action.

The risk assessment activities shall be conducted so as to generate the information necessary to meet the reporting requirements of the Baseline Risk Assessment as specified in Part III.E.2.

Formats, technology, and mathematical symbols used in the Baseline Risk Assessments shall correspond as closely as possible to those presented in EPA's Superfund risk assessment guidance referred to under Part I.C. Any alternative formats, technology, mathematical models shall be proposed in the RI/FS Work Plan.

III.C.7. Interim Response Actions. The RI/FS Work Plan shall propose any Interim Response Action (IRA) that can be implemented prior to completion of the RI/FS to stabilize, contain, and/or mitigate any release(s) or threatened release(s) of hazardous substances or pollutants or contaminants, which is reasonable and necessary to protect public health or welfare, or the environment. At a minimum, the RP shall conduct an IRA for the contaminated soils in the former disposal areas (e.g., D9). The design for any proposed IRA shall be consistent with the Remedial Design (Exhibit B, Part III.A.).

III.C.8. Site Security and Safety Plan. A Site-specific security and safety plan shall be prepared as a separate part of the RI/FS Work Plan, describing all measures including contingency plans and Site access restrictions which will be implemented during field activities to (1) ensure protection of public health and welfare, and the environment and (2) protect the health and safety of personnel involved in the RI/FS. These measures should consider the recommendations in the February 2005 Health Consultation, prepared by the Minnesota Department of Health.

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[1] An RP lacking significant risk assessment experience should be prepared to subcontract such work to qualified organization. The Baseline Risk Assessment shall be thoroughly reviewed by a technical editor to ensure that the text will be understandable by the MPCA technical staff, the MPCA Board, and the interested public.

III.C.9. Community Relations. The RI/FS Work Plan shall include a community relations section providing procedures for (1) informing local residents, municipalities, environmental groups, and interested parties about activities at the Site; (2) responding to inquiries from concerned citizens; and (3) cooperation with the MPCA Community Relations efforts. Refer to the MPCA community relations guidance document, entitled "Community Involvement in Risk Based Decision Making", located on the MPCA web site at http://www.pca.state.mn.us/cleanup/pubs/coor9_98.pdf.

III.C.10. Schedule. The RI/FS Work Plan shall propose a schedule that provides specific time frames and dates for completion of each activity and report conducted or submitted under the RI/FS Work Plan. The proposed schedule shall reflect the timelines specified in Part III of the RFRA, for conducting the RI and FS activities.

III.D. RI/FS Work Plan Implementation

Within thirty (30) days of the MPCA Commissioner approval of the RI/FS Work Plan, the RP shall initiate the RI and development and screening of response action alternatives. The RP shall complete the RI with one hundred fifty (150) days of initiating the RI activities. The RI/FS shall be conducted in accordance with all applicable federal, state, and local laws, rules, regulations, and ordinances including but not limited to Minn. Stat. ch. 103I and Minn. R. ch. 4725 for the installation of any ground water monitoring wells.

Any necessary additional RI activities not included in RI/FS Work Plan shall be identified and proposed in the quarterly reports submitted pursuant to Part II.C of the RFRA. The impact of the additional RI activities on the List of Possible Technology Types and Proposed Treatability Studies (Part III.C.4) shall also be described in the quarterly reports. If any additional RI activities will adversely affect work scheduled through the end of the upcoming month or will require significant revisions to the approved RI/FS Work Plan, the RP shall notify the MPCA Project Manager immediately of the situation followed by a written explanation within ten (10) days of the initial notification.

III.E. Remedial Investigation Report

Within sixty (60) days after completion of the RI, an RI Report detailing: (1) the data and results of the RI; (2) baseline risk assessment; and (3) screening of possible response action alternatives shall be prepared and submitted to the MPCA Commissioner. The RI Report shall organize and present all data generated as a result of implementation of the approved RI/FS Work Plan including, at a minimum, analytical results, assessment of completion of QA objectives, boring logs, field data sheets, and test results including data reduction and interpretation of all results. Further, the RI Report shall include:

III.E.1. Nature and Extent of the Release or Threatened Release. The RI Report shall include a description of the following:

- the nature and extent of hazardous substances or pollutants or contaminants released or threatened to be released to the soils, surface water, sediments, ground water, and air;
- the contaminant fate and migration pathways within each media;
- an evaluation of the reliability, and accuracy of the results of any computer models employed for data interpretation.

III.E.2. Baseline Risk Assessment. The results of two Baseline Risk Assessments, one addressing human health risks and one addressing ecological risks (Part III.C.6.), shall be reported as separate chapters in the RI Report.

Each chapter of the Baseline Risk Assessment shall include an executive summary written in layman's terms. A narrated videotape walk-through of the Site and surrounding areas shall be included to highlight information presented in the Baseline Risk Assessment text.

The risk assessment reports shall provide:

III.E.2.a. Data Evaluation. An evaluation of the results of the RI showing the actual and projected concentrations of hazardous substances, pollutants or contaminants present in relevant media (e.g., soil, surface water, ground water, air, sediment, and biota).

III.E.2.b. Toxicity Assessment. An identification of the hazard and toxicological properties of each contaminant identified through sampling and investigations. A comparison between the list of contaminants known to have been deposited on the Site versus those found through analyses. Identification of the chemical specific Applicable or Relevant and Appropriate Requirements (ARARs) for hazardous substances, or pollutants or contaminants identified at the Site.

III.E.2.c. Exposure Assessment. A comprehensive exposure pathways table. An inclusion/exclusion analysis and supporting rationale shall be included for each pathway. Following the inclusion/exclusion analysis, a determination of the extent and likelihood of exposure to contaminants at or from the Site. Identification of the potential receptor populations. Provide in-depth environmental fate and transport analysis for completed exposure pathways including physical and biological degradation processes and hydrogeologic conditions.

III.E.2.d. Risk Characterization. Both a maximum exposure case analysis and a Reasonable Maximum Exposure (RME) shall be provided for each pathway.

III.E.2.e. Uncertainty and Sensitivity Analysis. If there is or will be more than one analyte of concern associated with the Site, a chemical mixtures risk assessment addressing additivity and synergism shall be conducted and reported upon.

As part of the uncertainty analysis a Synergistics Effects Uncertainty Analysis (SEUA) shall be conducted and reported upon which assumes risks posed by conditions at the Site may be underestimated by an additivity based risk characterization. The SEUA shall provide modified remediation levels necessary to compensate for possible synergistic effects.

III.E.3. Development and Screening of Response Action Alternatives. The RI Report shall include a Development and Screening of Response Action Alternatives chapter that provides an evaluation of (a) each of the response action alternatives assembled from the List of Possible Technology Types and Proposed Treatability Studies (Part III.C.4), except for those technology types that have been eliminated from further consideration by the MPCA Commissioner in approving the RI/FS Work Plan, and (b) any other technology types identified by the RP or the MPCA Commissioner prior to approval of the RI Report.

The purpose of this chapter is to document the development of response action alternatives by combining or assembling technology types and their respective process options which will be applied to specific operable units or the Site as a whole. After the response action alternatives have been developed, they will be screened to assure that only those alternatives that will likely achieve the response action objectives and cleanup levels (Part IV.A.) will be retained for further analysis in the DAR.

III.E.3.a. Describe Process Options and Document the Screening of Response Action Alternatives. All development and screening decisions shall be thoroughly documented. This documentation shall include both written description and summary tables.

The development and screening of response action alternatives is accomplished by conducting the following tasks:

Development

From the list of technology types, as approved in the RI/FS Work Plan, develop the response action alternatives by describing the process options for each technology type and assemble the technology types with respective process options into response action alternatives. This step is accomplished by following the procedures outlined below:

- array the technology types and describe all possible process options for each technology type;
- for each process option, list the action and location specific ARARs;
- establish the volumes of contaminants and the volumes and types of contaminated media or areas of the Site to which the response action alternative will be applied (e.g. operable units); and
- assemble one or more technology type(s) and the respective process option into one response action alternative.

Screening

Once the response action alternatives have been developed, the response action alternatives are evaluated and screened using the Site Specific Response Action Objectives and Cleanup Levels (Part IV.A). Those response action alternatives that do not meet the Response Action Objectives and the Cleanup Levels are eliminated from further consideration. Response Action Alternatives that pass this screening are designated as "evaluated alternatives" and shall be further evaluated in the DAR.

The RP shall provide its recommendation and rationale regarding which response action alternatives should not be given further consideration for implementation at the Site.

III.E.3.b. Treatability Studies. This chapter of the RI Report shall provide:

- a description of all completed treatability studies and the results of any pilot studies, bench tests, or other activities that were performed to evaluate technology types and process options; and
- proposals, with time frames, for any additional treatability studies that are needed to further evaluate any response action alternatives that pass the screening and are to be further analyzed in the DAR.

III.F. Feasibility Study Report

Within sixty (60) days of the MPCA Commissioner's approval of the RI Report (Part IV.B.2), the RP shall prepare and submit to the MPCA Commissioner an FS Report consisting of the results of any treatability studies and a DAR. The DAR shall address all the evaluated alternatives specified by the MPCA Commissioner in approving or modifying the RI Report.

III.F.1. Treatability Studies. This section of the FS Report shall include the results of all completed and ongoing bench or pilot studies identified in the RI Report (Part III.E.3.b). In addition, for each of the technologies that have undergone treatability studies, the following factors shall be addressed and presented:

- effectiveness in treating the hazardous substances, pollutants or contaminants;
- reliability and past successes of the technology under similar conditions to those at the Site; and
- availability of the technology type and specific process option for implementation at the Site.

III.F.2. Detailed Analysis Report. This section of the FS Report shall analyze evaluated alternatives in detail considering the Remedy Selection Criteria (Part IV.C.). The DAR shall include the following elements for each evaluated alternative:

III.F.2.a. Detailed Description. Each evaluated alternative shall be described and individually assessed against the Balancing Criteria (Part IV.C.2.), namely, long term effectiveness, implementability, short term risks, total cost, and community acceptance. At a minimum, the detailed description for each evaluated alternative shall include:

- the operable unit to which the evaluated alternative would be applied;
- a description of the technology type and process option;
- a description of the engineering considerations required for implementation (e.g., for a pilot treatment facility, any additional studies that may be needed to proceed with final response action design);
- a description of operation, maintenance, and monitoring requirements;
- a description of off-Site disposal needs and transportation plans;
- a description of temporary storage requirements;
- a description of safety requirements associated with implementation, including both on-Site and off-Site health and safety considerations;
- a description of how any of the other evaluated alternatives could be combined with this evaluated alternative and how any of the combinations could best be implemented to produce significant cost savings and/or better achieve the Site Specific Response Action objectives and Cleanup Levels (Part IV.A);
- a description/review of on-Site or off-Site treatment or disposal facilities which could be utilized to ensure compliance with ARARs; and
- a description of the evaluated alternative response action dismantling to be conducted upon completion of response action.

III.F.2.b. Comparative Analysis of Evaluated Alternatives. Once the evaluated alternatives have been described and individually assessed against the Balancing Criteria (Part IV.C.2.) a comparative analysis shall be conducted to evaluate the relative performance of each evaluated alternative. The purpose of this comparative analysis is to identify the advantages and disadvantages of each evaluated alternative relative to one another with respect to each of the Balancing Criteria (Part IV.C.2), in order to facilitate selection of an appropriate remedy.

The comparative analysis shall include both a table and a narrative discussion describing the strengths and weaknesses of the evaluated alternatives relative to one another by using each specific component of each Balancing Criterion to evaluate the relative performance of each evaluated alternative. The narrative shall discuss how likely changes in variables could alter each evaluated alternative's relative performance. This section shall be organized in the following manner; under each individual Balancing Criterion, discuss the evaluated alternative that performs the best overall under that Balancing Criterion. Other evaluated alternatives shall be discussed in the order in which they perform. For innovative technologies, their potential advantages in performance or cost and the degree of uncertainty in their expected performance, as compared with more demonstrated technologies, shall also be discussed.

The presentation of differences among the evaluated alternatives can be measured either qualitatively or quantitatively, as appropriate, and shall identify substantive differences (e.g., greater short-term risk concerns or greater cost). Quantitative information that was used to assess the evaluated alternatives (e.g., specific cost estimates, time until the Site-specific response action objectives and cleanup levels are met, and levels of residual contamination) shall be included in these discussions.

III.F.2.c. Recommended Evaluated Alternative(s) and Conceptual Design. The RP shall include in the DAR its recommendation of the evaluated alternative (or combination of evaluated alternatives) which should be implemented at the Site. The purpose of preparing a conceptual design is to illustrate all aspects of the RP-recommended evaluated alternative (or combination) in sufficient detail to enable the MPCA Commissioner to fully evaluate the RP-recommended evaluated alternative (or combination). The conceptual design for the RP-recommended evaluated alternative (or combination) shall include, but not be limited to, the elements listed below:

- a conceptual plan view drawing of the overall site, showing general locations for response action components;
- conceptual layouts (plan and cross sectional views where required) for the individual components to be installed, or actions to be implemented;
- conceptual design criteria and rationale;
- a description of types of equipment required, including approximate capacity, size, and materials of construction;
- process flow sheets, including chemical consumption estimates and a description of the process;
- an operational description of process units or other components;
- a description of unique structural concepts for components;
- a description of operation and maintenance requirements;
- a discussion of potential construction problems;
- right-of-way requirements;
- additional engineering data required to proceed with design;
- a discussion of permits that are required pursuant to environmental and other statutes, rules, and regulations;

- implementation cost estimate;
- annual O&M cost estimates;
- remedial action dismantling cost; and
- estimated implementation schedule.

IV. MPCA COMMISSIONER ACTIONS

IV.A. **Establishment of Site Specific Response Action Objectives and Cleanup Levels**. The MPCA Commissioner shall assess data as they are obtained through implementation of the RI. When sufficient data exist, the MPCA Commissioner shall specify and notify the RP of the Site-specific response action objectives and cleanup levels for the contaminants, environmental media of concern, and exposure pathways associated with the Site. The Site-specific objectives and cleanup levels shall be determined using ARARs, the "Compilation of Ground Water Rules and Regulations MPCA Superfund Program," dated March 27, 1991, Attachment I, the MPCA Risk-Based Site Evaluation Manual (available on the MPCA web site at http://www.pca.state.mn.us/cleanup/riskbasedoc.html), and documented case studies. The MPCA Commissioner will notify the RP of the Site-specific response action objectives and cleanup levels no later than the approval of the RI Report.

IV.B. **Review of Submittals**. The RP shall submit to the MPCA Commissioner all work plans, reports, or other documents (submittals) required by this Exhibit. The review and approval, modification, or rejection of submittals shall be in accordance with this Section and Part IV of the RFRA. Given the MPCA preference for implementing response actions in an expedient manner, the MPCA Commissioner may request implementation of an IRA at any point during the RI/FS.

IV.B.1. Approval of RI/FS Work Plan. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RI/FS Work Plan. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RI/FS Work Plan with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RI/FS Work Plan that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional information.

If the MPCA Commissioner rejects the RI/FS Work Plan, the Commissioner will: 1) specify the deficiencies in the RI/FS Work Plan that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised RI/FS Work Plan.

As part of reviewing the RI/FS Work Plan, the MPCA Commissioner will eliminate from further consideration any possible technology types that are clearly not feasible or effective considering the Remedy Selection Criteria (Part IV.C.), and may identify other possible technology types and process options to be analyzed in the Development and Screening of Response Action Alternatives chapter (Part III.E.3) of the RI Report.

Site security and safety are the responsibility of the RP. The MPCA Commissioner may comment on the Site Security and Safety Plan but will neither approve nor disapprove that plan. Within ten (10) days of notification of the MPCA Commissioner's approval of the RI/FS Work Plan, the RP shall implement the Site Security and Safety Plan, taking into account the comments of the MPCA Commissioner.

IV.B.2. Approval of the RI Report. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RI Report. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RI Report with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RI Report that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional formation.

If the MPCA Commissioner rejects the RI Report, the Commissioner will: 1) specify the deficiencies in the RI Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised RI Report.

IV.B.2.a. Evaluation of the Response Action Alternatives

The MPCA Commissioner shall, as part of reviewing the RI Report, evaluate the response action alternatives presented in the Development and Screening of Response Action Alternatives chapter (Part III.E.3). In determining whether to eliminate a particular response action alternative from further consideration, the MPCA Commissioner will determine whether that alternative meets the response action objectives and cleanup levels (Part IV.A) specified for the Site. In approving the RI Report the MPCA Commissioner will specify the evaluated alternatives to be addressed in the DAR.

IV.B.3. Approval of Feasibility Study Report. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the FS Report. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the FS Report with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the FS Report that necessitate the need for information necessary to correct the deficiencies; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the revised FS Report.

If the MPCA Commissioner rejects the FS Report, the Commissioner will: 1) specify the deficiencies in the FS Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised FS Report.

IV.C. **Remedy Selection Criteria**. The purpose of implementing any response action is to protect the public health, welfare, and the environment by preventing, minimizing or eliminating the release(s), or threatened release(s) of hazardous substances, pollutants, or contaminants. Protection of public health, welfare, and the environment is best achieved by implementing a permanent remedy for the Site. An implemented remedy is considered permanent when it allows for unrestricted use of all land and natural resources impacted by the contaminants and, except for the purpose of treatment, does not involve removal of the contaminants to another site and minimizes exchange of the contaminants to other environmental media. Refer to the MPCA guidance document on remedy selection, located on the MPCA web site at http://www.pca.state.mn.us/cleanup/pubs/rem9_98.pdf

The MPCA Commissioner will apply the following threshold, balancing criteria and community acceptance to select a final response action from amongst evaluated alternatives.

IV.C.1. Threshold Criterion. Each response alternative or evaluated alternatives must meet the threshold criterion of providing overall protection for the public health and welfare, and the environment. This criterion is met if the response action alternative or the evaluated alternative will achieve the response action objectives and cleanup levels identified pursuant to the Establishment of Site Specific Response Action Objectives and Cleanup Levels (Part IV.A.) or provides for a permanent remedy.

IV.C.2. Balancing Criteria. Evaluated alternatives that meet the threshold criterion of overall protection of public health and welfare, and the environment shall be evaluated using the Balancing Criteria listed below. The evaluated alternative that provides the best balance among the Balancing Criteria in consideration of the site-specific circumstances shall be selected as the final response action. The Balancing Criteria are listed in order of priority with long-term effectiveness being the most important.

- Long-Term Effectiveness
  Long-term effectiveness is the ability of an evaluated alternative to maintain the desired level of protection of public health and welfare, and the environment over time. Permanent remedies provide absolute long-term effectiveness. In the event a permanent remedy is not feasible, evaluated alternatives that significantly alter the hazardous substances or pollutants or contaminants to produce significant reductions in toxicity, mobility, or volume through treatment will be preferred. In addition, the ability of the alternative to obtain and/or manage treatment residuals, minimize transfer of contaminants to another environmental media, and maintain established response action objectives and cleanup levels over time shall be a major consideration.
- Implementability
  The technical and administrative feasibility of implementing the evaluated alternative and the availability of goods and services needed to implement the evaluated alternative shall be considered.
- Short-Term Risks
  The short-term risks that may be posed as a result of implementing an evaluated alternative shall be considered and weighted against the ultimate long-term benefits of implementing that evaluated alternative.
- Total Costs
  The complete cost breakdown of implementation of the evaluated alternative including the projected costs of any long-term monitoring, operation and maintenance, and response action dismantling shall be considered. The future costs to replace the alternative or respond to a future release shall also be considered in this evaluation.

IV.C.3. Community Acceptance. The degree of community acceptance shall be determined for each evaluated alternative.

The community shall be consulted regularly in regard to the response action alternatives available for remediation at the Site. Efforts will be made to inform the community about the hazards of the Site and the advantages and disadvantages of various approaches to remediation and to gain an understanding of the concerns and preferences of the community with regard to the final remedy for the Site. The community's concerns and response action preferences will be considered when the MPCA Commissioner selects a remedy.

IV.D. Selection of Response Action and Record of Decision

The MPCA Commissioner will select the final response action(s) and will document this selection in a Record of Decision (ROD) or Minnesota Decision Document (MDD). The final RI and FS Reports, as approved by the MPCA Commissioner, will, with the MPCA Site file, form the basis for the selection of the final response action for the Site and will provide the information necessary to support the development of the ROD/MDD. The ROD/MDD will identify the selected evaluated alternative (or combination of evaluated alternatives) to be implemented by the RP pursuant to Exhibit B to the RFRA. The ROD/MDD shall be appended to and made an integral part of the RFRA.

EXHIBIT B
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Exhibit B

REMEDIAL DESIGN AND RESPONSE ACTION IMPLEMENTATION

I. INTRODUCTION

Part III.B. of the Request for Response Action (RFRA), to which this Exhibit is appended, requests the Responsible Party (RP) to prepare a Remedial Design/Response Action Plan (RD/RA Plan) and implement Response Actions (RAs) at the Site. This Exhibit sets forth the requirements for preparing the RD/RA Plan and implementing the RAs, which have been selected by the Minnesota Pollution Control Agency (MPCA) Commissioner pursuant to Part IV.D. of Exhibit A to the RFRA, and is appended to and made an integral part of the RFRA.

II. RETAIN CONSULTANT

The RP shall retain a consultant qualified to undertake and complete the requirements of this Exhibit. If the RP retains the same consultant used to complete Exhibit A to the RFRA, the RP shall proceed immediately with preparation of the RD/RA Plan. If the RP chooses to retain a different consultant, the RP shall retain the consultant and notify the MPCA project manager of the name of that consultant within thirty (30) days of notification of approval of the FS Report by the MPCA Commissioner.

III. REMEDIAL DESIGN/RESPONSE ACTION PLAN

III.A. RD/RA Plan Submittal

Within ninety (90) days of notification of approval of the FS Report by the MPCA Commissioner, the RP shall prepare and submit to the MPCA Commissioner for review and approval a RD/RA Plan which shall be based on the approved RI/FS reports and the Record of Decision (ROD) or Minnesota Decision Document (MDD) issued by the MPCA Commissioner under Exhibit A to the RFRA.

III.B. RD/RA Plan Contents

The purpose of the RD/RA Plan is to provide a detailed design, an implementation schedule, and a monitoring plan for the RAs specified in the ROD/MDD which, upon implementation, will protect the public health and welfare, and the environment from the release or threatened release of hazardous substances, pollutants or contaminants, at or from the Site.

The RD/RA Plan shall set forth in detail the steps necessary to implement the Site remedy specified in ROD/MDD. The RD/RA Plan shall include a restatement of the response action objectives and cleanup levels specified in the ROD/MDD. The RD/RA Plan shall include, at a minimum, the following:

III.B.1. Remedial Design. The purpose of the remedial design is to specify detailed methods and time schedules for the implementation of the RAs specified in the ROD/MDD. This section shall include, at a minimum, the following elements:

- design criteria and rationale;
- a plan view drawing of the overall Site, showing general locations for response action components;
- technical and operational plans and engineering designs for implementation of the response action including plan and cross sectional views for the individual components to be installed or actions to be implemented;
- a description of the types of equipment to be employed, including capacity, size, and materials or construction;
- an operational description of process units or other RA components;
- process flow sheets, including process material (e.g., chemical or activated carbon) consumption rates, and a description of the process;
- a discussion of potential construction problems and respective contingency plans;
- a schedule for implementing the construction phase;
- a Site-specific hazardous waste transportation plan (if necessary);
- the identity of all contractors, transporters, or other persons conducting removal or response actions at the Site;
- a description of any permits or licenses required to implement the RA;
- a description of the post RA operation and maintenance procedures and schedules; and
- a description of activities to be undertaken by the RPs during RA implementation to fulfill the requirements of Part III, Sections C.1. (Project Management), C.3. (Sampling and Investigations), C.5. (Record Retention), C.8. (Site Security and Safety Plan), and C.9. (Community Relations) of Exhibit A to the RFRA as they pertain to the removal or response actions and operation and maintenance activities.

III.B.2. RA Monitoring Plan. The RD/RA Plan shall propose an RA monitoring plan for the Site. The purpose of post-RA implementation monitoring is to determine the status and effectiveness of the implemented RAs. The RA monitoring plan shall, at a minimum, contain the following in order to determine that the cleanup levels specified in the ROD/MDD are achieved:

III.B.2.a. Environmental Media and Analytical Parameter List. The environmental media (soil, ground water, surface water, sediments, biota, and air) and a corresponding list of analytes to be monitored shall be proposed, along with the selection rationale, and a corresponding list of chemical analytical methodologies (including EPA or Standard Method numbers and detection limits) to be performed.

III.B.2.b. Monitoring Facility Location and Design. The design and location of all monitoring facilities/locations shall be proposed.

III.B.2.c. Sampling Schedule. A sampling schedule for the analytical parameters proposed in the RA monitoring plan for all monitoring locations shall be proposed. Sampling shall, at a minimum, be conducted on a quarterly basis.

III.B.2.d. Reporting Plan. A schedule for reporting the results of long-term monitoring to the MPCA shall be proposed. The schedule shall, at a minimum, contain the following:

Quarterly Monitoring Reports. The RP shall submit quarterly analytical results to the MPCA Commissioner. The reporting schedule shall comply with Part II.C of the RFRA.

2. Annual Monitoring Reports. The RP shall submit an Annual Monitoring Report to the MPCA Commissioner on or before January 1, 2008, and each January 1st thereafter. Any remedial technology employed in implementation of the RD/RA Plan shall be left in place and operated by the RP until the MPCA Commissioner authorizes the RP in writing to discontinue, move, or modify some or all of the remedial technology. The RP may request discontinuation of the remedial technologies in the annual report, when the cleanup levels set forth in the ROD/MDD have been achieved. The RP shall move or modify the remedial technology when the movement or modifications, as approved by the MPCA Commissioner, may better achieve the remedial action objectives set forth in the ROD/MDD.

The Annual Monitoring Report shall contain the following:

- a Site map showing all monitoring locations;
- the results of all parameter analyses for the previous year;
- the results of all water level measurements for the previous year;
- regional and Site specific ground water piezometric maps for each aquifer including surface water elevations;
- cross section(s) indicating relative communication between aquifers;
- a map for each sampling event showing each monitoring location with contaminant concentrations and isoconcentration lines for selected parameters;
- graphs and tables illustrating the concentrations over time using data from each sampling event (these graphs and tables shall be cumulative showing parameter analyses for all previous years as
- well as the reporting year); and
- a sampling plan for the next year with an assessment of the monitoring parameters, sampling frequencies, and the need for the addition or deletion of monitoring locations and parameters.

III.C. RD/RA Plan Implementation

Within thirty (30) days of the MPCA Commissioner approval of the RD/RA plan, the RP shall initiate the RA. The purpose of RA implementation is to take those actions that will protect public health and welfare, and the environment, from the release or threatened release of hazardous substances or pollutants or contaminants at or from the Site.

The RD/RA Plan, as approved or modified by the MPCA Commissioner shall be implemented in accordance with the time schedules set forth in Part III of the RFRA and Part III.B. of this Exhibit. The implementation of RAs shall be conducted in accordance with all applicable federal and state ARARs, and local laws, rules, regulations, and ordinances.

During implementation of the RD/RA Plan, the MPCA Commissioner may specify such additions and/or revisions to the RD/RA Plan as the Commissioner deems necessary to protect public health and welfare, and the environment.

III.D. RA Implementation Report

Within sixty (60) days of the completion of implementation of the RAs specified in the approved RD/RA Plan, a RA Implementation Report which includes the following elements, shall be submitted to the MPCA Commissioner:

- the data and results of the RA implementation;
- the follow-up actions, if any, to be taken in the following one-year period;
- a certification that all work plans, specifications, and schedules have been implemented and completed in accordance with the RD/RA Plan as approved or modified by the MPCA Commissioner;
- discussion of difficulties encountered during the implementation that may alter and/or impair or otherwise reduce the effectiveness of the RA implementation to prevent, eliminate, or minimize the release or threatened release of hazardous substances or pollutants or contaminants, at or from the Site, or which may require unanticipated operational or maintenance actions to maintain the effectiveness of any of the implemented RAs; and
- a discussion of any necessary modifications to the operation and maintenance procedures as approved.

IV. REPORT ON COMPLETION OF RA

Within sixty (60) days of notification, by the MPCA Commissioner, that all Site-specific Response Action Objectives and Cleanup Levels (Exhibit A, Part IV.A.) have been met, a Report on Completion of RA, which includes the following elements, shall be submitted to the MPCA Commissioner.

- a summary of the response action objectives and cleanup levels and a history of how they were met;
- certification that all RAs have been properly dismantled, including supporting documentation (e.g., monitoring well sealing records);
- a summary of any ongoing institutional controls (e.g., deed restrictions);
- a final cost summary.

V. MPCA COMMISSIONER ACTIONS

The RP shall submit to the MPCA Commissioner all plans, reports, or other documents (submittals) required by this Exhibit. The review and approval, approval with modifications and/or a request for additional information, or rejection of submittals shall be in accordance with this section and Part IV of the RFRA. The Site Safety and Security Plan does not require MPCA Commissioner approval.

V.A. Approval Of The RD/RA Plan, RA Implementation Report, And Report On Completion Of RA

The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RD/RA Plan, RA Implementation Report, and the Report on Completion of RA based on the requirements of Parts III.B, III.D, and IV respectively. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional information.

If the MPCA Commissioner rejects the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA, the Commissioner will: 1) specify the deficiencies in the RD/RA Plan, RA Implementation Report, or Completion of RA Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the information necessary to correct the deficiencies.

ATTACHMENT 3

DEFINITIONS

1. "RELEASE" is defined in Minn. Stat. § 115B.02, subd. 15 as follows:

"Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur.
Release does not include:

(1) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, watercraft, or pipeline pumping station engine;

(2) release of source, by-product, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954, under United States Code, title 42, section 2014, if the release is subject to requirements with respect to financial protection established by the federal Nuclear Regulatory Commission under United States Code, title 42, section 2210;

(3) release of source, by-product or special nuclear material from any processing site designated pursuant to the Uranium Mill Tailings Radiation Control Act of 1978, under United States Code, title 42, section 7912(a)(1) or 7942(a); or

(4) any release resulting from the application of fertilizer or agricultural or silvicultural chemicals, or disposal of emptied pesticide containers or residues from a pesticide as defined in section 18B.01, subdivision 18.

2. "FACILITY" is defined in Minn. Stat. § 115B.02, subd. 5 as follows:

"Facility" means:

(1) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft;

(2) any watercraft of any description, or other artificial contrivance used or capable of being used as a means of transportation on water; or

(3) any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise come to be located.
Facility does not include any consumer product in consumer use.

"POLLUTANT OR CONTAMINANT" is defined in Minn. Stat. § 115B.02, subd. 13 as follows:

"Pollutant or contaminant" means any element, substance, compound, mixture, or agent, other than a hazardous substance, which after release from a facility and upon exposure of, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion

through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in the organisms or their offspring.

Pollutant or contaminant does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of such synthetic gas and natural gas.

4. "HAZARDOUS SUBSTANCE" is defined in Minn. Stat. § 115B.02, Subd. 8 as follows:

"Hazardous substance" means:

(1) any commercial chemical designated pursuant to the Federal Water Pollution Control Act, under United States Code, title 33, section 1321(b)(2)(A);

(2) any hazardous air pollutant listed pursuant to the Clean Air Act, under United States Code, title 42, section 7412; and

(3) any hazardous waste.

Hazardous substance does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of such synthetic gas and natural gas, nor does it include petroleum, including crude oil or any fraction thereof which is not otherwise a hazardous waste.

5. "HAZARDOUS WASTE" is defined in Minn. Stat. § 115B.02, Subd. 9 as follows:

"Hazardous waste" means:

(1) any hazardous waste as defined in section 116.06, subdivision 11, and any substance identified as a hazardous waste pursuant to rules adopted by the agency under section 116.07; and

(2) any hazardous waste as defined in the Resource Conservation and Recovery Act, under United States Code, title 42, section 6903, which is listed or has the characteristics identified under United States Code, title 42, section 6921, not including any hazardous waste the regulation of which has been suspended by act of Congress.

6. “HAZARDOUS WASTE” is defined in Minn. Stat. § 116.06, subd. 11 as follows:

"Hazardous waste" means any refuse, sludge, or other waste material or combinations of refuse, sludge or other waste materials in solid, semisolid, liquid, or
contained gaseous form which because of its quantity, concentration, or chemical, physical, or infectious characteristics may (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Categories of hazardous waste materials include, but are not limited to: explosives, flammables, oxidizers, poisons, irritants, and corrosives. Hazardous waste does not include source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended.

7. "RESPONSIBLE PERSON" is defined in Minn. Stat. § 115B.03 under the following provisions:

Subdivision 1. General rule. For the purposes of sections 115B.01 to 115B.20, and except as provided in subdivisions 2 and 3, a person is responsible for a release or threatened release of a hazardous substance, or a pollutant or contaminant, from a facility if the person:

(1) owned or operated the facility:

(i) when the hazardous substance, or pollutant or contaminant, was placed or came to be located in or on the facility;

(ii) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or

(iii) during the time of the release or threatened release;

(2) owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(3) knew or reasonably should have known that waste the person accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of it in a manner contrary to law.

Subd. 2. Employees and employers. [omitted]

Subd. 3. Owner of Real Property. An owner of real property is not a person responsible for the release or threatened release of a hazardous substance from a facility in or on the property unless that person:

(a) was engaged in the business of generating, transporting, storing, treating, or disposing of a hazardous substance at the facility or disposing of waste at the facility, or knowingly permitted others to engage in such a business at the facility;

(b) knowingly permitted any person to make regular use of the facility for disposal of waste;

(c) knowingly permitted any person to use the facility for disposal of a hazardous substance;

(d) knew or reasonably should have known that a hazardous substance was located in or on the facility at the time right, title, or interest in the property was first acquired by the person and engaged in conduct by which he associated himself with the release; or

(e) took action which significantly contributed to the release after he knew or reasonably should have known that a hazardous substance was located in or on the facility.

For the purpose of clause (d), a written warranty, representation, or undertaking, which is set forth in an instrument conveying any right, title or interest in the real property and which is executed by the person conveying the right, title or interest, or which is set forth in any memorandum of any such instrument executed for the purpose of recording, is admissible as evidence of whether the

person acquiring any right, title, or interest in the real property knew or reasonably should have known that a hazardous substance was located in or on the facility.

Any liability which accrues to an owner of real property under §§ 115B.01 to 115B.15 does not accrue to any other person who is not an owner of the real property merely because the other person holds some right, title, or interest in the real property.

An owner of real property on which a public utility easement is located is not a responsible person with respect to any release caused by any act or omission of the public utility which holds the easement in carrying out the specific use for which the easement was granted.

8. CONTAMINANT(s):

When used separately, this word means: any chemical parameter that evidences the presence of hazardous substances or pollutants or contaminants.

9. MINNESOTA DECISION DOCUMENT (MDD):

An MDD is a document, prepared by MPCA which sets forth the rationale for selecting specific response actions that will be implemented at a site or a particular operable unit at a site.

10. CONTAMINANT SOURCE AREA:

A discrete area from which contamination has emanated or may emanate in the future, e.g. an area of contaminated soil may be a contaminant source area for ground water contamination at a particular site.

11. BASELINE RISK ASSESSMENT:

An evaluation of the actual and potential threat to public health and welfare, and the environment posed by the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants, in the absence of any remedial action.

12. OPERABLE UNIT:

An operable unit is a discrete portion of the Site, and may be defined by geographic area, type of environmental medium or contaminant source area, or other relevant factors.

13. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS):

ARARs are state or federal standards, requirements, criteria, or limitations that: 1) are legally applicable to the release of hazardous substances or pollutants or contaminants at the Site or the response actions selected to address the release, or 2) are relevant and appropriate to the release or response actions; i.e., they address circumstances sufficiently similar to those at the Site that their application is well suited in determining whether response actions are reasonable and necessary to protect the public health and welfare, or the environment.

14. TECHNOLOGY TYPES:

Technology types are general categories of technologies that can be applied to sites for the purpose of remediating contamination. Examples include: chemical treatment, thermal destruction, and immobilization.

15. PROCESS OPTIONS:

Process options are specific processes within a given technology type. For example, the chemical treatment technology type would include such process options as precipitation, ion exchange, and oxidation/reduction

16. RESPONSE ACTION ALTERNATIVES:

Response action alternatives are potential response actions consisting of one or more technology types and their respective process options which, when implemented, will be protective of human health and welfare, and the environment and will likely meet the site-specific response action objectives and cleanup levels.

17. EVALUATED ALTERNATIVE:

An evaluated alternative is a response action alternative that has successfully passed the screening conducted during the Remedial Investigation. The MPCA Commissioner makes the final determination of which response action alternatives will be considered "evaluated" alternatives.

ATTACHMENT 4

MINNESOTA POLLUTION CONTROL AGENCY
Solid and Hazardous Waste Division

Agenda Item Control Sheet

Agenda # 14

MEETING DATE: January 22, 1985 APPEARANCE REQUESTED - YES: X NO: ____
SCHEDULED TIME: ____

PREPARED BY: David T. Richfield DATE PREPARED: December 27, 1984
DATE MAILED : January 11, 1985

SUBJECT: Request for Issuance of a Request for Response Action to 3M Company Regarding Contamination At and Around the 3M Chemolite Disposal Site Located in Cottage Grove

LOCATION: Cottage Grove (CITY) Washington (COUNTY)

TYPE OF ACTION:

Permit	____	Request For Hearing	____	New	____
Stipulation	____	Request for legal action	____	Modification	____
Contract	____	Variance request	____	Extension	____
Policy	____	Rulemaking	____	Revocation	____
Information	____	Administrative order	____	Other	X

RECOMMENDED ACTION:

Issuance	X	Approval	____	No action needed	____
Denial	____	Authorization	____		

ISSUE STATEMENT:

Ground water beneath the 3M Chemolite Disposal Site is contaminated by volatile organic compounds as a result of the past disposal of hazardous substances in burn pits and disposal pits utilized by the 3M Company (3M) from approximately 1947 to 1973. The extent and magnitude of ground water contamination has not been determined. Therefore, a Remedial Investigation and Feasibility Study (RI/FS), Response Action Plan (RAP) and its implementation are required.

The Minnesota Pollution Control Agency (MPCA) staff is recommending that the MPCA Board issue to 3M the attached Request for Response Action.

ATTACHMENTS:

1. Definitions
2. 5-Page Request for Response Action with Exhibits
3. Site Location Map

MINNESOTA POLLUTION CONTROL ..NCY
Site Response Section
Division of Solid and Hazadous Waste

Request for Issuance of a Request for Response Action to 3M Company Regarding Contamination At and Around the 3M Chemolite Disposal Site Located in Cottage Grove

January 22, 1984

ISSUE STATEMENT

Ground water beneath the 3M Chemolite Disposal Site is contaminated by volatile organic compounds as a result of the past disposal of hazardous substances in burn pits and disposal pits utilized by the 3M Company (3M) from approximately 1947 to 1973. The extent and magnitude of ground water contamination has not been determined. Therefore, a Remedial Investigation and Feasibility Study (RI/FS), Response Action Plan (RAP) and its implementation are required.

The Minnesota Pollution Control Agency (MPCA) staff is recommending that the MPCA Board issue to 3M the attached Request for Response Action.

I. BACKGROUND

The Environmental Response and Liability Act (Minnesota Superfund Act), Minn. Stat. Chapter 115B, establishes procedures through which the Minnesota Pollution Control Agency (MPCA) can protect the public health or welfare or the environment from the release or threatened release of hazardous substances. The operative provisions of Minn. Stat. Ch. 115B with respect to removal and remedial action are contained in Section 115B.17. Section 115B.17, Subd. 1 provides that:

> Whenever there is a release or threatened release from a facility of any pollutant or contaminant which presents an imminent and substantial danger to the public health or welfare or the environment or whenever a hazardous substance is released or there is a threatened release of a hazardous substance from a facility:
>
> (a) The agency may take any removal or remedial action relating to the hazardous substance, or pollutant or contaminant, which the agency deems necessary to protect the public health or welfare or the environment. Before taking any action the agency shall:
>
> (1) Request any responsible party known to the agency to take actions which the agency deems reasonable and necessary to protect the public health or welfare or the environment, stating the reasons for the actions, a reasonable time for beginning and completing the actions taking into account the urgency of the actions for protecting the public health or welfare or the environment, and

the intention of the agency to take action if the requested actions are not taken as requested;

(2) Notify the owner of real property where the facility is located or where response actions are proposed to be taken, if the owner is not a responsible party, that responsible parties have been requested to take response actions and that the owner's cooperation will be required in order for responsible parties or the agency to take those actions; and

(3) Determine that the actions requested by the agency will not be taken by any known responsible party in the manner and within the time requested.

In summary, Section 115B.17 requires that before it takes removal or remedial action, the MPCA must (1) issue requests for response action to known responsible parties; (2) notify the owners of the property at which the Request for Response Action (RFRA) are directed (if the owners are not responsible parties); and, (3) determine that no known responsible party will take the actions within the manner and time requested.

In addition, Section 115B.17 provides that, before it can issue a RFRA, the MPCA must find that (1) there is a release or threatened release; (2) the release or threatened release was from a facility; (3) the release or threatened release involves either (a) a pollutant or contaminant which presents an imminent or substantial danger to the public health, welfare or the environment or (b) a hazardous substance; and, (4) the person(s) to whom the RFRA are to be directed are responsible parties. [The terms release; facility; pollutant or contaminant; hazardous substance; and responsible parties are all defined in the Minnesota Superfund Act. These definitions are set out in Attachment 1 and discussed in Part II (Discussion) of this Board Item.]

The attached proposed RFRA refers to authority found in Minn. Stat. Sections 115B.17 and 115B.18. (See I.A. of the attached RFRA.) The discussion above describes the requirements of a RFRA issued under Section 115B.17. The discussion below explains the applicability and requirements of a Section 115B.18 RFRA and the relationship between Section 115B.17 and 115B.18.

Minn. Stat. Section 115B.17 establishes both the procedures through which the MPCA requires responsible parties to take removal and remedial action and the prerequisites for the MPCA to take the action itself. Among other things, Section 115B.18 establishes procedures for bringing actions against responsible parties to compel performance and for injunctive relief.

Like Section 115B.17, Section 115B.18 includes a provision related to Requests for Response Action:

> Subd. 3. [REQUESTS FOR RESPONSE ACTION.] A request for emergency removal action shall be made by the director. Other requests for response actions shall be made by the agency. A request shall be in writing, shall state the action requested, the reasons for the action, and a reasonable time by which the action must be begun and completed taking into account the urgency of the action for protection of the public health or welfare or the environment.

Unlike Section 115B.17, Section 115B.18 does not specify when the RFRA is to be issued. Given the focus of Section 115B.18, it is however, reasonable to construe that section as requiring the MPCA to issue a RFRA prior to bringing an action to compel performance or for an injunction.

The content of both Section 115B.17 and Section 115B.18 RFRA's are largely the same: All Section 115B.17 RFRA's will be sufficient to constitute Section 115B.18 RFRA. 1/ It is therefore efficient and reasonable for the MPCA to issue a joint Section 115B. 17 and Section 115B.18 RFRA.

1/ Prior to making Section 115B.17 Requests, the MPCA must make four preliminary determinations (see discussion supra). Although it is not explicitly required, these four determinations probably need also be made before a Section 115B.18 Request is issued.

There is, however, a substantive difference in the actions that MPCA must take under Section 115B.17 and under Section 115B.18 after it has issued a Request for Response Action. That is, under Section 115B.17, the MPCA may not take a removal or remedial action until after it finds that no responsible party will take the action in the time and manner requested in the Request for Response Action. Under Section 115B.18, however, the MPCA need not make this finding and may simply commence an action to compel performance or for an injunction after it has issued a Request for Response Action.

II. DISCUSSION

This discussion is divided into seven sections, one providing a narrative discussion of the history underyling the proposed RFRA (Part II.A.); one for each of the four determinations that must be made before a RFRA can be issued (Parts II.B. - II.E.); one describing the requested action (Part II.F.); and finally one describing actions to be taken after the RFRA is issued (Part II.G.)

A. History Underlying this Request for Response Section

In February of 1981 the MPCA received a "hot line" complaint regarding disposal of industrial wastes at the 3M Chemolite waste incineration facility in Cottage Grove. Pursuant to a request by the MPCA, 3M began an investigation of past waste disposal at the 3M Chemolite Facility. According to a 3M report dated July 28, 1981, 3M disposed industrial wastes in several locations at its Chemolite facility from 1947 to 1973. The waste disposal areas included:

1. Hydrofluoric Tar Pit
2. Wastewaster Sludge Disposal Area
3. Boiler Ash Disposal Area
4. Acid Pit
5. Burn Pit
6. Burn Facility

These areas are collectively known as and referenced to as the 3M Chemolite Disposal Site or the Site. 2/

In March, 1982 a 3M report regarding an initial investigation of the 3M Chemolite Disposal Site indicated that ground water at the Site was contaminated by several industrial solvents including 1,1,1-trichloroethane; methylene chloride; chloroform; 1,1-dichloroethane; 1,2-dichloroethane;

2/ The map attached to this Board Item shows the location of the 3M Chemolite Disposal Site.

1,2-dichloroethylene; 1,1,2-trichlorethane; acetone; benzene; toluene, and methyl ethyl ketone. MPCA staff analysis of the ground water confirmed the release of industrial solvents to the ground water.

In the Spring of 1983 an additional disposal area was discovered at the 3M Chemolite Disposal Site. This disposal area consisted of at least 100 barrels containing solvents and resins. The full extent of disposal in this area has not been determined.

Further investigation of the 3M Chemolite Disposal Site is needed to define the magnitude and extent of soil and ground water contamination to allow for the selection and implementation of appropriate response actions to clean-up the site.

The 3M Chemolite Disposal Site was included on the October, 1984 MPCA Permanent List of Priorities under the Class D (RI/FS) category with a Hazard Ranking Score of 33. The Site has also been included on the 1985 Project List with 150,000 dollars allocated for completing a RI/FS.

B. There is a Release

As set out in Attachment 1 of this Board Item, "release" is defined broadly in Minn. Stat. §115B.02, Subd. 15 to mean "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injection, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur". [There are certain exceptions to this definition, none of which applies in this case. See Attachment 1.]

Monitoring wells in the area of the 3M Chemolite Disposal Site are contaminated with solvents as specified previously. In addition, 3M records indicate that hazardous substances were disposed at several locations at the 3M Chemolite Disposal Site from 1947 to 1973.

This information clearly demonstrates that there has been a release and there continues to be a threat of release into the environment within the meaning of Minn. Stat. § 115B.02, Subd. 15.

C. The release is from a facility

As set out in Attachment 1, "facility is defined broadly in Minn. Stat. § 115B.02, Subd. 5 to mean:

(a) Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft;

(b) Any watercraft of any description, or other artificial contrivance used or capable of being used as a means of transportation on water; or

(c) Any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

"Facility" does not include any consumer product in consumer use.

Under this definition, the disposal pits, burn pits, and disposal areas at the 3M Chemolite Disposal Site constitutes a facility within the meaning of the Minn. Stat. § 115B.02, Subd. 5.

D. The release involves several hazardous substances.

As set out in Attachment 1, "hazardous substance" is defined broadly in Minn. Stat. § 115B.02, Subd. 8, to mean:

(a) Any commercial chemical designated pursuant to the Federal Water Pollution Control Act, under 33 U.S.C. Section 1321(b)(2)(A);

(b) Any hazardous air pollutant listed pursuant to the Clean Air Act, under 42 U.S.C. Section 7412; and

(c) Any hazardous waste.

"Hazardous substance" does not include natural gas, natural gas liquids, liquified natural gas, synthetic gas usable for fuel or mixtures of such synthetic gas and natural gas, nor does it include petroleum, including crude oil or any fraction thereof which is not otherwise a hazardous waste.

Hazardous waste [which is included as a "hazardous substance" under subd. 8(c)] is defined in the Minn. Stat. § 115B.02, Subd. 9, to mean:

(a) Any hazardous waste as defined in Section 116.06, Subdivision 13, and any substance identified as a hazardous waste pursuant to the rules adopted by the agency under Section 116.07; and

(b) Any hazardous waste as defined in the Resource Conservation and Recovery Act, under 42 U.S.C. Section 6903, which is listed or has the characteristics identified under 42 U.S.C. Section 6921, not including any hazardous waste the regulation of which has been suspended by act of Congress.

Substances that are defined as hazardous under these definitions have been found at the 3M Chemolite Disposal Site. The following chart lists the hazardous substance being released and shows the statute or rule under which they are classified as hazardous:

Released Substance

Hazardous Substance	Minn. Rule pt. 4045.0135 Subpt. 4(f)	CWA 40 CFR 116.4	RCRA 40 CFR Part 261
1,1,1-Trichloroethane	X		X
Methylene Chloride	X		X
Chloroform	X	X	X
1,1-Dichloroethane	X		X
1,2-Dichloroethane	X	X	X
1,1,2-Trichloroethane	X		X
Acetone	X		X
Benzene	X	X	X
Toluene	X	X	X
Methyl ethyl ketone	X		X

If there is an X in column 1, the substance is a hazardous substance as a result of its classification under State of Minnesota Hazardous Waste Rules if there is an X in column 2, the substance is a hazardous substance as a result of its classification under the Clean Water Act; and if there is an X in column 3, the substance is a hazardous substance or constituent under the Resource Conservation and Recovery Act.

E. The person to whom the response request is directed is a responsible party.

As set out in Attachment 1, "responsible person" 3/ is generally defined in the Minn. Stat. § 115B.03, subd. 1, to include persons who:

(a) Owned or operated the facility (1) when the hazardous substances, or pollutant or contaminant, was placed or came to be located in or on the facility; (2) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or (3) during the time of the release or threatened release.

(b) Owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(c) Knew or reasonably should have known that waste he accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of in a manner contrary to law.

3M is a responsible party under Minn. Stat. § 115B.03, Subd. 1(a), because 3M owned and operated the facility when the hazardous substances were placed or came to be placed in or on the facility and under Subd. 1(b) because 3M owned or possessed the hazardous substances and disposed of those substances.

F. The requested response actions are reasonable and necessary.

The attached proposed RFRA describes a series of actions to be taken at the 3M Chemolite Disposal Site. These actions are reasonable and necessary to protect the public health, welfare, or the environment. These actions are necessary to gather additional information that will complete the

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3/ The Minn. Stat. § 115B.17, refers to "responsible parties". There is, however, no definition of "responsible parties" but is a definition of "responsible persons" in the Act. The definition should be considered to apply each time the Minnesota Superfund Act refers to either "responsible persons" or "responsible parties".

identification, assessment, choice, and design of remedies for the 3M Chemolite Disposal Site, as well as implementation of appropriate remedial or removal actions at the 3M Chemolite Disposal Site.

The response actions described in the attached proposed RFRA include:

(1) Implementation of a Remedial Investigation.

(2) Conducting a Feasibility Study to evaluate alternative potential response actions.

(3) Preparation and implementation of a Response Action Plan.

The MPCA staff has evaluated the length of time it takes to accomplish the actions specified in the proposed RFRA, has considered the urgency of the situation, and established a reasonable schedule for completing these actions commensurate with these considerations.

G. The actions taken by the MPCA staff after a Request for Response Action is issued.

In this section of the Board Item, the MPCA staff set out their view of the events that follow the issuance of certain Requests for Response Action by the MPCA Board. The MPCA staff believe that an explanation of the manner in which the MPCA staff is implementing the Minn. Stat. Ch. 115B. will assist both the MPCA Board and the recipients of Requests for Response Action in determining what constitutes an adequate response to Requests for Response Action.

Since the Minnesota Superfund Act was enacted, it has been and continues to be the opinion of the MPCA staff that, where possible, the MPCA should attempt to obtain from responsible persons a negotiated settlement on the response actions that are needed to be undertaken to clean up a hazardous waste site. In the MPCA staff's view, the issuance of a Request for Response Action should not be considered the end to negotiations, but instead a useful and important step through which negotiations can be brought to a head. The MPCA staff further believe that the actions specified in Requests for Response Action

provide a sound basis for such negotiations.

In the MPCA staff's view, the procedure is as follows: the MPCA Board issues a Request for Response Action. Either (a) responsible parties and the MPCA staff negotiate and reach a Consent Order resolving the issues raised in the Request for Response Action or (b) responsible parties refuse to undertake the actions specified in the Request for Response Action. To the extent negotiations are fruitful [situation (a) above], the MPCA staff will return to the MPCA Board with an appropriate recommendation. If, on the other hand, responsible parties refuse to enter into negotiations or negotiations are not fruitful [situation (b) above], the MPCA staff will bring the matter back to the MPCA Board for a determination that the responsible person will not take the actions requested within the established time periods.

To make it clear that the MPCA is willing to consider amendments to the terms of Requests for Response Action [to be set forth in a negotiated Consent Order], the MPCA staff recommends that, where appropriate, Requests for Response Action issued include a period for negotiating a Consent Order with the MPCA staff. (See section I.D. and I.E. of the attached proposed Request for Response Action.)

III. CONCLUSIONS

The 3M Chemolite Disposal Site located in Cottage Grove, Washington County, Minnesota constitutes a facility within the meaning of Minn. Stat. § 115B.02, Subd. 5.

The wastes or substances found or disposed of at the 3M Chemolite Disposal Site are hazardous substances within the meaning of Minn. Stat. § 115B.02, Subd. 8.

There have been one or more releases and continues to be a threatened release of these hazardous substances at the 3M Chemolite Disposal Site within

the meaning of Minn. Stat. § 115B.02, Subd. 15.

With respect to those releases and threatened releases, 3M is a responsible person within the meaning of Minn. Stat. § 115B.03, Subd. 1(a) and (b).

The schedules for the requested actions in the attached proposed RFRA are reasonable taking into account the urgency of the actions necessary for protecting the public health or welfare or the environment.

IV. RECOMMENDATION

The MPCA staff recommends that the MPCA Board adopt the suggested staff resolution on the following page.

SUGGESTED STAFF RESOLUTION

BE IT RESOLVED, that the Minnesota Pollution Control Agency finds that:

1. The 3M Chemolite Disposal Site located in Cottage Grove, Washington County, Minnesota, constitutes a facility within the meaning of Minn. Stat. § 115B.02, Subd. 5.

2. The wastes and substances found or disposed of at the 3M Chemolite Disposal Site are hazardous substances within the meaning of Minn. Stat. § 115B.02, Subd. 8 and 9.

3. There have been one or more releases and continues to be a threatened release of hazardous substances at the 3M Chemolite Disposal Site within the meaning of Minn. Stat. § 115B.02, Subd. 15.

4. With respect to those releases and threatened releases the 3M Company (3M) is a responsible person within the meaning of Minn. Stat. § 115B.03, Subd. 1(a) and (b).

5. The actions requested in the Request for Response Action are reasonable and necessary to protect the public health or welfare or the environment.

6. The schedule for requested action in the Request for Response Action is reasonable taking into account the urgency of the actions for protecting the public health or welfare or the environment.

BE IT FURTHER RESOLVED that the Minnesota Pollution Control Agency issues the Request for Response Action to 3M. The Chairperson and the MPCA Director are authorized to execute the attached Request for Response Action on behalf of the Minnesota Pollution Control Agency.

BE IT FURTHER RESOLVED that the Minnesota Pollution Control Agency directs the MPCA staff to initiate, and encourages the responsible persons to participate in discussions for the purpose of reaching an agreement on the actions that should be taken by the responsible persons.

DEFINITIONS

1. RELEASE, is defined in section 2, subd. 15 of the Minnesota Superfund Act as follows:

> "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur.
>
> "Release" does not include:
>
> (a) Emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, watercraft, or pipeline pumping station engine;
>
> (b) Release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Engery Act of 1954, under 42 U.S.C. Section 2014, if the release is subject to requirements with respect to financial protection established by the federal nuclear regulatory commission under 42 U.S.C. Section 2210;
>
> (c) Release of a source, byproduct or special nuclear material from any processing site designated pursuant to the Uranium Mill Tailings Radiation Control Act of 1978, under 42 U.S.C. Section 7912(a)(1) or 7942(a); or
>
> (d) Any release resulting from the application of fertilizer or agricultural or silvicultural chemicals, or disposal of emptied pesticide containers or residues from a pesticide as defined in section 18A.21, subdivision 25.

2. FACILITY, is defined in section 2, subd. 5 of the Minnesota Superfund Act as follows:

> "Facility" means
>
> (a) Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft;

(b) Any watercraft of any description, or other artificial contrivance used or capable of being used as a means of transportation on water; or

(c) Any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

"Facility" does not include any consumer product in consumer use.

3. POLLUTANT OR CONTAMINANT, is defined in section 2, subd. 13, of the Minnesota Superfund Act as follows:

"Pollutant or contaminant" means any element, substance, compound, mixture, or agent, other than a hazardous substance, which after release from a facility and upon exposure of, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in the organisms or their offspring.

"Pollutant or contaminant" does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of such synthetic gas and natural gas.

4. HAZARDOUS SUBSTANCE" is defined is section 2, subd. 8, of the Minnesota Superfund Act as follows:

"Hazardous substance" means:

(a) Any commerical chemical designated pursuant to the Federal Water Pollution Control Act, under 33 U.S.C. Section 1321(b)(2)(A);

(b) Any hazardous air pollutant listed pursuant to the Clean Air Act, under 42 U.S.C. Section 7412; and

(c) Any hazardous waste.

"Hazardous substance" does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel or mixtures of such synthetic gas

and natural gas, nor does it include petroleum, including crude oil or any fraction thereof which is not otherwise a hazardous waste.

5. "HAZARDOUS WASTE" is defined in section 2, subd. 9, of the Minnesota Superfund Act as follows:

"Hazardous waste" means:

(a) Any hazardous waste as defined in section 116.06, subdivision 13, any any substance identified as a hazardous waste pursuant to rules adopted by the agency under section 116.07; and

(b) Any hazardous waste as defined in the Resource Conservation and Recovery Act, under 42 U.S.C. Section 6903, which is listed or has the characteristics identified under 42 U.S.C. Section 6921, not including any hazardous waste the regulation of which has been suspended by act of Congress.

6. "RESPONSIBLE PERSON" is defined in section 3 of the Minnesota Superfund Act as follows:

Subdivision 1. [GENERAL RULE.] For the purposes of sections 1 to 20, and except as provided in subdivisions 2 and 3, a person is responsible for a release or threatened release of a hazardous substance, or a pollutant or contaminant, from a facility if the person:

(a) Owned or operated the facility (1) when the hazardous substance, or pollutant or contaminant, was placed or came to be located in or on the facility; (2) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or (3) during the time of the release or threatened release;

(b) Owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(c) Knew or reasonably should have known that waste he accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of it in a manner contrary to law.

Subdivision 2. [EMPLOYEES AND EMPLOYERS.] When a person who is responsible for a release or threatened release as provided in subdivision 1 is an employee who is acting in the scope of his employment:

(a) The employee is subject to liability under section 4 or 5 only if his conduct with respect to the hazardous substance was negligent under circumstances in which he knew that the substance was hazardous and that his conduct, if negligent, could result in serious harm.

(b) His employer shall be considered a person responsible for the release or threatened release and is subject to liability under section 4 or 5 regardless of the degree of care exercised by the employee.

Subdivision 3. [OWNER OF REAL PROPERTY.] An owner of real property is not a person responsible for the release or threatened release of a hazardous substance from a facility in or on the property unless that person:

(a) was engaged in the business of generating, transporting, storing, treating, or disposing of a hazardous substance at the facility or disposing of waste at the facility, or knowingly permitted others to engage in such a business at the facility;

(b) knowingly permitted any person to make regular use of the facility for disposal of waste;

(c) knowingly permitted any person to use the facility for disposal of a hazardous substance;

(d) knew or reasonably should have known that a hazardous substance was located in or on the facility at the time right, title, or interest in the property was acquired by the person and engaged in conduct by which he associated himself with the release; or

(e) took action which significantly contributed to the release after he knew or reasonably should have known that a hazardous substance was located in or on the facility.

For the purpose of clause (d), a written warranty, representation, or undertaking, which is set forth in an instrument conveying any right, title or interest in the real property and which is executed by the person conveying the right, title or interest, or which is set forth in any memorandum of any such instrument executed

for the purpose of recording, is admissible as evidence of whether the person acquiring any right, title, or interest in the real property knew or reasonably should have known that a hazardous substance was located in or on the facility.

Any liability which accrues to an owner of real property under sections 1 and 15 does not accrue to any other person who is not an owner of the real property merely because the other person holds some right, title, or interest in the real property.

An owner of real property on which a public utility easement is located is not a responsible person with respect to any release caused by any act or omission of the public utility which holds the easement in carrying out the specific use for which the easement was granted.

STATE OF MINNESOTA

COUNTY OF RAMSEY

In the Matter of the 3M Chemolite Disposa Site, Cottage Grove, Minnesota

MINNESOTA POLLUTION CONTROL AGENCY

REQUEST FOR RESPONSE ACTION

To: 3M Company

I. NOTIFICATION OF OBLIGATION TO TAKE RESPONSE ACTION

A. This document is issued by the Minnesota Pollution Control Agency (MPCA) and constitutes a Request for Response Action (RFRA), as authorized by Minn. Stat. §§ 115B.17 and 115B.18 (Supp. 1983).

B. YOU ARE HEREBY NOTIFIED that the MPCA has made the following determination:

1. The waste disposal pits, burn pits and other disposal areas located at the property, known as the 3M Chemolite Disposal Site, in Cottage Grove, Washington County constitute a facility within the meaning of Minn. Stat. § 115B.02, subd. 5. (The property, the waste disposal pits, burn pits and the other disposal areas located in Cottage Grove, Washington County is hereinafter referred to as "the 3M Chemolite Disposal Site");

2. the wastes and substances found or disposed of at the 3M Chemolite Disposal Site are hazardous substances within the meaning of Minn. Stat. § 115B.02, subd. 8 and subd. 9;

3. there have been one or more releases and continues to be a threatened release of these hazardous substances from the facilities within the meaning of Minn. Stat. § 115B.02, subd. 15; and

4. with respect to these releases and threatened releases, the 3M Company (3M) is a responsible person within the meaning of Minn. Stat. § 115B.03, subd. 1(a) and 1(b).

C. Having made these determinations, the MPCA formally requests that 3M take the response actions described in Section II of this RFRA. A timetable for beginning and completing the actions is set out in Section III. The reasons for the requested actions are set out in Section IV. Section V. describes the intention of the MPCA to take action if 3M fails to take the requested response action within the timetable set out in Section III. Section V. also describes the consequences of failure to satisfactorily respond to this Request for Response Action.

D. A period of ninety (90) days has been provided following issuance of this Request for Response Action to allow 3M to meet with the MPCA staff. The purpose of this time period is to provide for negotiations on the specific terms of the requested action.

However, 3M must separately notify the MPCA staff by Feburary 15, 1985 of their intentions to meet with the MPCA staff. Failure by 3M to notify the MPCA staff by February 15, 1985 of its intention to meet with the MPCA staff may result in a determination by the MPCA that 3M is unwilling to take adequate response actions in this matter.

Notification of intent to meet with the MPCA staff should be sent to David Richfield, Project Leader, Division of Solid and Hazardous Waste, Minnesota Pollution Control Agency, 1935 West County Road B-2, Roseville, Minnesota, 55113, telephone number (612) 296-7710.

E. If a Consent Order between 3M and the MPCA staff is reached, the MPCA staff will present the draft Consent Order to the MPCA. The Consent Order, if approved by the MPCA, will control the response actions taken at the 3M Chemolite Disposal Site. If no Consent Order is reached within the allotted time period, the matter will be referred to the MPCA for a Determination of Inadequate Response. The MPCA, upon determining that a responsible person has not adequately responded, may authorize litigation to require the responsible person to take necessary response actions and/or reimburse the State for costs incurred if the State elects to implement response actions. These steps are described more fully in Section V.

II. REQUESTED RESPONSE ACTION

The MPCA has determined (1) that the following actions constitute removal or remedial actions within the meaning of Minn. Stat. §§ 115B.02, subds. 16 and 17 and (2) that these removal or remedial actions are reasonable and necessary to protect the public health, welfare or the environment. Consequently, the MPCA hereby formally requests that 3M take the actions within the timetables established in Section III.

A. Remedial Investigation (RI)

The MPCA recognizes that investigation at the 3M Chemolite Disposal Site has already begun. However, additional remedial investigations are necessary to provide an adequate data base for completing an evaluation of alternative removal and remedial actions (response actions). The purpose of the RI is to provide sufficient information to allow selection and implementation of response actions to mitigate the release of hazardous substances at the 3M Chemolite Disposal Site. The requirements of the RI are described in Exhibit A to this RFRA. Exhibit A is appended to and made an integral part of this RFRA.

B. Feasibility Study (FS)

The purpose of the feasibility study (FS) is to provide a detailed evaluation of the feasibility and effectiveness of implementing alternative response actions at the 3M Chemolite Disposal Site. The FS shall use and build upon the information generated by the RI. The requirements of the FS are described in Exhibit A to this RFRA.

C. Response Action Plan (RAP) and Response Action Implementation

The purpose of the RAP is to provide a detailed design of response actions which, upon implementation, will protect the public health, welfare, and the environment from the threatened or actual release of hazardous substances from the 3M Chemolite Disposal Site. The requirements of the RAP and RAP implementation are described in Exhibit B to this RFRA.

D. Reports

The MPCA Director shall be provided with quarterly progress reports by the thirtieth day of each third month. The progress reports shall describe activities conducted pursuant to this Request for Response Action during the proceeding quarter and activities planned for the next quarter. The progress reports shall be addressed to:

David T. Richfield, Project Leader
Division of Solid and Hazardous Waste
Minnesota Pollution Control Agency
935 West County Road B-2
Roseville, Minnesota 55113

III. TIMETABLE FOR COMPLETING THE REQUESTED RESPONSE ACTIONS

The MPCA, after considering the urgency of actions needed to protect public health or welfare or the environment, has determined that the following timetable is necessary and reasonable. The timetable references specific elements of Exhibits A and B to this RFRA.

Notice of Intent to Comply	February 15, 1985
Consent Order Negotiation Period	February 15, 1985 to May 16, 1985
Retain Consultant to Complete Requirements of Exhibit A	Within 30 days of effective date of the RFRA.
Submit Site Security Plan	Within 60 days of effective date of RFRA.
Implement Site Security Plan	Within 90 days of effective date of RFRA.
Submit Exhibit A, Section V, Task A Plans and Reports	Within 60 days of effective date of RFRA.
Implement RI	Within 30 days after MPCA Directors approval of RI work plan and QA/QC plan.
Submit RI Report	Within 120 days of approval of the RI work plan.

Submit Alternatives Report	Within 60 days of MPCA Director's acceptance of the RI Final Report.
Submit Detailed Analysis Report	Within 60 days of MPCA Director's Notification of Review of Alternatives Report
Retain Consultant to Complete Requirements of Exhibit B	Within 30 days of Approval Detailed Analysis Report by MPCA Director
Submit RAP Work Plan and Routine Monitoring Proposal	Within 30 days of Retaining Consultant
Submit RAP	Within 60 days of Approval of RAP Work Plan by MPCA Director
Implement RAP	Within 30 days of RAP Approval by the MPCA Director
Report Results of RA Implementation	Within 30 days of completion of the RA.

The MPCA Director shall be promptly notified of any anticipated or actual failure to comply with the dates or other terms of this Request for Response Action. Such notice shall include the reasons for the noncompliance and steps proposed for a return to compliance or alternative actions proposed to comply with the intent of this Request for Response Action. The MPCA Director may accept or modify the proposed compliance measures if the Director determines that such measures are adequate and that the need for the modification is not a result of failures within the control of the responsible parties.

The MPCA Director may grant extensions of the time schedules set forth in the Request for Response Action in the event that the Responsible Persons demonstrate to the MPCA Director good cause for granting the extension. The extension shall be commensurate with the delays involved.

IV. REASONS FOR THE REQUESTED ACTION

The ground water beneath and in the vicinity of the 3M Chemolite Disposal Site in Washington County is contaminated with hazardous substances. The 3M Chemolite Disposal Site is a source of the release of these hazardous substances.

3M has conducted initial studies to identify waste disposal areas and the general geology and hydrology of the 3M Chemolite Disposal Site. The initial studies indicate that there are at least 8 separate waste disposal

areas that were used from 1947 to 1973. The disposal areas contain a variety of wastes from 3M manufacturing processes. 3m has also sampled ground water from numerous monitoring wells at the 3M Chemolite Disposal Site. Analyses of these samples has shown a release of several industrial solvents.

Studies conducted to date on the scope of contamination at the 3M Chemolite Disposal Site have not yielded sufficient information to allow assessment, selection, design or implementation of response actions to remedy the release of hazardous substances or to allow assessment, selection, design or implementation of methods to prevent additional or continued releases.

The requested actions set out in Section II and III will provide such additional information as is necessary to fully evaluate and allow for selection, design and implementation of appropriate response actions to prevent additional or continued releases.

V. MPCA INTENTION TO TAKE ACTION AND CONSEQUENCES OF RESPONSIBLE PERSON'S FAILURE TO TAKE REQUESTED ACTION.

A. YOU ARE HEREBY NOTIFIED that under the Minnesota Environmental Response and Liability Act, if responsible persons fail to take the requested actions in an adequate or timely fashion, the responsible persons may be subject to the following actions:

1. the MPCA may undertake or complete the requested response actions and seek reimbursement from responsible persons for all costs associated with such action; or

2. the responsible person may be subject to an action to compel performance of the requested response action or for injunctive relief to enjoin the release or threatened release.

In either case responsible persons who fail to take the response actions requested by the MPCA in an adequate or timely fashion may be required to pay a civil penalty in an amount to be determined by the court of up to $20,000 per day for each day that the responsible person fails to take reasonable and necessary response actions.

B. YOU ARE HEREBY FURTHER NOTIFIED that if you fail to take the requested response action, the MPCA intends to take one or more of the actions specified in A. above.

VI. REQUIREMENT TO REIMBURSE THE MPCA

YOU ARE HEREBY FURTHER NOTIFIED that all responsible persons whether or not they complete the requested response action may be required to:

A. reimburse the MPCA for all reasonable and necessary expenses it incurs, including all response costs, and administrative and legal expenses in the investigation and/or cleanup of the facilities; and

B. pay for any damages to the air, water, or wildlife resulting from the release of a hazardous substance , pollutant or contaminant.

Duane Dahlberg, Ph.D., Chairman	Thomas J. Kalitowski, Director
DATE: _____	EFFECTIVE DATE: _____

Minnesota Pollution Control Agency

Exhibit A

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

I. INTRODUCTION

Parts II.A. and B. of the Request for Response Action (RFRA), to which this Exhibit is appended, requires the 3M Company (3M) to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the 3M Chemolite Disposal Site. This Exhibit sets forth the requirements for completing the RI/FS and is appended to and made an integral and enforceable part of the RFRA.

II. PREPARATION AND REVIEW OF SUBMITTALS

3M shall submit to the Minnesota Pollution Control Agency Director (MPCA Director) all reports, work plans, well placement and construction plans, quality control plans, and other submittals required by this Exhibit. The site safety and security plans described in Part IV do not require MPCA Director approval. All other submittals require MPCA Director approval before implementation. Review and modification of the Evaluation Report described in Part V, Task A.1. shall be governed by the provisions of Part V, Task A, below.

III. RETAIN CONSULTANT

Within 30 days of the effective date of the Order, 3M shall retain a consultant(s) qualified to undertake and complete the requirements of this Exhibit and shall notify the MPCA Project Leader of the name of that consultant(s).

IV. SITE SECURITY AND SAFETY PLANS

3M shall prepare and submit to the MPCA Director for comment (1) a 3M Chemolite Disposal Site security plan to limit and control the general public's access to the 3M Chemolite Disposal Site and (2) a 3M Chemolite Disposal Site safety plan to protect the health and safety of personnel involved in the RI/FS.

The 3M Chemolite Disposal Site security plan shall be submitted to the MPCA Director within sixty (60) days of the effective date of the RFRA.

The 3M Chemolite Disposal Site safety plan shall be submitted at the same time that the Proposed Remedial Investigation is submitted, pursuant to Part V., below. At a minimum, the 3M Chemolite Disposal Site safety plan shall incorporate and be consistent with the requirements of:

1. Section 111(c)(6) of CERCLA;
2. EPA Order 1440.3 -- Respiratory Protection;
3. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
4. EPA Occupational Health and Safety Manual;
5. OSHA Requirements (29 CFR 1910 and 1926);
6. Interim Standards Operating Safety Guide (Revised September, 1982) by the Office of Emergency and Remedial Response.

3M Chemolite Disposal Site security and safety are the responsibility of 3M. The MPCA Director may comment on the 3M Chemolite Disposal Site security and safety plans but will neither approve nor disapprove those plans.

Within 90 days of the effective date of the RFRA, 3M shall implement the 3M Chemolite Disposal Site security plan, taking into account the comments of the MPCA Director, if any. 3M shall implement the 3M Chemolite Disposal Site safety plan, taking into account the comments of the MPCA Director, if any, during the implementation of the Remedial Investigation, conducted pursuant to Part V, below.

V. REMEDIAL INVESTIGATION

3M shall design and implement a Remedial Investigation (RI) which accomplishes the purposes and meets the requirements of this Part. The purposes

of the RI are (1) to provide information and data needed for the selection and implementation of remedial and removal actions (response actions) at the 3M Chemolite Disposal Site and (2) define the extent and magnitude of ground water contamination. The requirements of the RI are set forth in the Tasks below.

3M shall identify and propose methods in the quarterly reports (submitted pursuant to Part II.E. of the RFRA) for any necessary additional RI activities not included in the RI Work Plan as approved and shall describe in the quarterly reports the impact of the additional RI activities on the list of possible alternative response actions derived pursuant to Task A.2. below. If any additional RI activities will adversely affect work scheduled through the end of the upcoming quarter or will require significant revisions to the RI Work Plan as approved, the MPCA Project Leader, shall be notified immediately of the situation followed by a written explanation within ten (10) days of the initial notification.

Task A. Submit an Evaluation Report, List of Possible Alternative Response Actions, Proposed Remedial Investigation Work Plan and Quality Assurance/Quality Control Plan

Within 60 days of the effective date of the RFRA, 3M shall submit for MPCA Director review and approval, modification or rejection an Evaluation Report, a List of Possible Alternative Response Actions, a proposed Remedial Investigation Work Plan (RI Work Plan) and a Quality Assurance/Quality Control Plan (QA/QC Plan).

The Evaluation Report shall contain the information set forth in Task A.1. below. If the Evaluation Report does not meet the requirements of Task A.1. below, the MPCA Director will return it within ten (10) days for modification by 3M. 3M shall, within ten (10) days of receipt of MPCA Director comments, resubmit the modified Evaluation Report.

The List of Possible Alternative Response Actions and the proposed RI Work Plan shall contain the information set forth in Task A.2.a. and b. below. The QA/QC Plan shall contain the information set forth in Task A.3. below. The List of Possible Alternative Response Actions, the proposed RI Work Plan and the QA/QC Plan shall be reviewed and approved, modified, or rejected by the MPCA Director.

1. Evaluation Report

a. Site background

The Evaluation Report shall include a detailed explanation of the operational history, location, pertinent area boundary features, general physiography, hydrology, stratigraphy, and geology of the 3M Chemolite Disposal Site. In addition, the Evaluation Report shall include a detailed discussion of all past activities related to the release or threatened release and disposal of hazardous substances at the 3M Chemolite Disposal Site.

b. Topographic survey

The Evaluation Report shall include 3M Chemolite Disposal Site maps using a one inch = 50 feet scale and a one foot contour interval. Surface water features, buildings, process areas, storage tanks, well locations, forested areas, utilities, paved areas, easements, right-of-ways, pipelines (surface and subsurface) and impoundments shall be shown. The maps shall be of sufficient detail and accuracy to locate all current or proposed future work at the 3M Chemolite Disposal Site.

c. History of remedial or removal actions

The Evaluation Report shall include a summary of any previous response actions conducted at the 3M Chemolite Disposal Site. This summary shall include field inspections, sampling surveys, cleanup activities, and other technical

investigations as well as any removal or remedial action taken at the 3M Chemolite Disposal Site.

2. a. List of Possible Alternative Response Actions

3M shall submit a complete list of alternative response actions which are technically feasible and, upon implementation, would abate or minimize the release or threatened release at the 3M Chemolite Disposal Site. This list shall also contain general information regarding the nature and applicability of the identified possible alternative response actions. This list is intended to serve as a reference for 3M and the MPCA Director to design a comprehensive RI Work Plan.

b. Proposed Remedial Investigation Work Plan

3M shall submit a proposed RI Work Plan which, upon implementation: (1) will provide for the complete characterization of the 3M Chemolite Disposal Site and its actual or potential hazard to public health, welfare and the environment; (2) will produce sufficient data and information to allow 3M to submit the report described in Task C, below; and, (3) will produce data of sufficient quantity and adequate technical content to assess the possible alternative response actions during the Feasibility Study.

At a minimum, the proposed RI Work Plan shall include proposed methodologies to accomplish the following RI activities and shall also include proposed dates and/or time intervals for initiation and completion of each of the following RI activities:

(1) Hazardous Substance, Pollutant or Contaminant Characterization

An investigation shall be proposed to identify any hazardous substances that have been stored, used, or disposed of at the 3M Chemolite Disposal Site. 3M Shall propose a plan for monitoring the hazardous substances identified through the investigation in the soils, ground water, and surface water investigations required by this Exhibit.

(2) Source Investigation

A source identification program shall be proposed that upon implementation will define all areas related to the 3M Chemolite Disposal Site that function as or are potential source areas of ground water contamination. An essential element of this effort involves employee interviews, and reviews of 3M records. 3M shall also propose geophysical or equivalent methods to define source areas that contain barrelled waste.

(3) Hydrologic Investigation

A hydrologic investigation shall be proposed that will result in:

a. Definition of the ground water flow patterns and directions, both horizontal and vertical, and

b. Definition of seasonal variations in those patterns and directions, and

c. Definition of contaminant concentrations and their variations.

To accomplish these goals several activities are required:

a. Additional monitoring wells or piezometers shall be proposed to clearly define ground water flow conditions. The elevations of all wells at the 3M Chemolite Disposal Site shall be surveyed to a common reference point. Water elevations in all wells shall be measured.

b. Ground water monitoring wells shall be proposed to define conditions upgradient and downgradient of suspected source areas.

c. Tests shall be proposed to determined the hydraulic properties of the water bearing formations near and under the 3M Chemolite Disposal Site. Estimates shall be made of the ground water flow directions and rates in the horizontal and vertical directions.

(4) Soils Investigation

The sources contributing to ground water contamination at the 3M Chemolite Disposal Site are contaminating or have contaminated soils in the unsaturated zone between the land surface and the water table. Soil sampling including split spoon sampling, test trenching or other methods shall be proposed to obtain soil samples for analysis. The soil samples shall be analysed for priority pollutants. The soil sampling program shall be proposed for areas of known or suspected disposal or in areas where ground water contamination exists and no known or suspected source has been identified.

3. Quality Assurance/Quality Control Plan

3M shall submit a proposed QA/QC Plan to be utilized in implementing the RI Work Plan. The proposed QA/QC Plan shall be prepared so as to be consistent with the requirements of the U.S. EPA's Contract Laboratory Program. The proposed QA/QC Plan shall specify the procedures for:

a. field protocol including procedures for chain-of-custody, sample collection and transportation and storage of samples;

b. calibration in terms of accuracy, precision, and references (the QA/QC Plan shall also specify the number of times and intervals at which analysis equipment will be calibrated);

c. laboratory analytical methods, including methods for ensuring accurate measurements of data in terms of precision, accuracy, completeness, comparability, and lab sample storage procedures;

d. reporting;

e. internal quality control;

f. audits;

g. preventive maintenance;

h. corrective action; and

i. routine assessment of data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters involved.

Task B. Conduct Remedial Investigation

Within 30 days of notification of the MPCA Director's approval or modification of the List of Possible Alternative Response Actions, the RI Work Plan and the QA/QC Plan, 3M shall initiate the RI. 3M shall conduct the RI in accordance with the methods and time schedules set forth in the RI Work Plan and QA/QC Plan as approved or modified by the MPCA Director. The RI shall be conducted in accordance with all Federal, State and local laws, rules, regulations and ordinances including but not limited to 7 MCAR §§ 1.210-1.224 for the installation of any ground water monitoring wells.

Task C. Report Results of Remedial Investigation

Within 120 days of notification of the MPCA Director's approval or modification of the RI Work Plan and QA/QC Plan, made pursuant to Part V., Task A, 3M shall prepare and submit to the MPCA Director a report (RI Final Report) detailing the data and results of the RI. The RI Final Report shall organize and present all data, analytical results, boring logs and test results. Further, the RI Final Report shall include a detailed description of the following:

1. Nature and extent of the release or threatened release

3M shall include in the RI Final Report a description of the following:

a. The types, physical states and amounts of hazardous substances at the 3M Chemolite Disposal Site.

b. Any medium (e.g., ground water, surface water, soils, air) affected by the hazardous substances at the 3M Chemolite Disposal Site.

c. The pathways (e.g., leachate, multi-aquifer wells, runoff) by which contamination reached the media;

d. The sources of the release (e.g., sludge deposits , barrels, hazardous waste deposits)

e. The extent and magnitude of hazardous substances contamination in the soil and in the source areas on the 3M Chemolite Disposal Site.

f. The extent and magnitude of hazardous substances contamination in the ground water beneath and around the 3M Chemolite Disposal Site.

g. The extent and magnitude of hazardous substances contamination in the surface water on and and around the 3M Chemolite Disposal Site.

h. The location and condition of existing wells within a 1,000 foot radius of the 3M Chemolite Disposal Site.

i. Any human or environmental exposure within a 1,000 foot radius of the 3M Chemolite Disposal Site.

2. Analysis of Data in Relation to the Possible Alternative Response Actions

3M shall include in the RI Final Report the list of possible alternative response actions identified pursuant to Part V. Task A.2. as approved or

modified by the MPCA Director and shall include an analysis as to whether the RI has produced sufficient information to allow for a detailed analysis during the Feasibility Study of each possible alternative response action.

Task D. Approval of the RI Final Report

The MPCA Director shall review and approve, modify, or reject the RI Final Report. The MPCA Director shall notify 3M of final approval or modification of the RI Final Report.

If the MPCA Director rejects the RI Final Report, the MPCA Director shall specify the deficiencies and reasons for the rejection. 3M shall correct the deficiencies, and resubmit the RI Final Report to the MPCA Director within thirty (30) days of the notification of rejection.

VII. FEASIBILITY STUDY

The purpose of the Feasibility Study (FS) is to provide a detailed evaluation of the feasibility and effectiveness of implementing alternative response actions at 3M Chemolite Disposal Site. 3M shall conduct the FS in accordance with the National Oil and Hazardous Substance Contingency Plan, 40 CFR, Section 300.68, (f.), (g.), (h.), and (i.). The FS shall contain sufficient information and analyses for the MPCA Director to make the determination of the appropriate extent of remedy, as specified in 40 CFR Section 300.68 (j.). The FS shall use and build upon the information generated by the RI and shall consist of the following Tasks.

Task A. Alternatives Report

Within 60 days of notification of the MPCA Director's acceptance of the RI Final Report made pursuant to Part V., Task D above, 3M shall develop and submit to the MPCA Director an Alternatives Report. The Alternatives Report shall provide an evaluation of (a) each of the possible alternative response actions

identified in Part VI., Task A.2.a, except for those alternatives which have been specifically rejected by the MPCA Director and (b) any other alternative identified by 3M or the MPCA Director. The purpose of preparing an Alternatives Report is to provide sufficient information on each of the possible alternative response actions to enable the MPCA Director to reject any possible alternate response actions which are clearly not feasible or effective. (The alternative response actions to be evaluated in the Alternatives Report and the Detailed Analysis Report are referred to below as the "evaluated alternatives.")

For each evaluated alternative, the following shall be addressed and presented in the Alternatives Report:

1. Cost

A preliminary estimate of the capital, operation and maintenance costs associated with installing or implementing each evaluated alternative.

2. Environmental Effects

A general discussion of the expected adverse effects which each evaluated alternative may have on the environment;

3. Effectiveness

A preliminary analysis as to whether each evaluated alternative is likely to effectively abate or minimize the release or threatened release and/or minimize the threat of harm to the public health, welfare and the environment.

4. Technical Feasibility and Implementability

A preliminary analysis of the technical feasibility and implementability of each evaluated alternative both in relation to the location and conditions of the release or threatened release and in relation to the reliability of the technologies which could be employed to implement the evaluated alternative.

5. Identification of Technologies

An explanation of the various technologies which may be employed to

implement each of the evaluated alternatives and a summary of the effectiveness, reliability, past success and availability of each specified technology.

3M shall include in the Alternatives Report its recommendation and rationale regarding which evaluated alternatives should not be given further consideration for implementation at 3M Chemolite Disposal Site. 3M shall base its recommendation on the extent to which each of the evaluated alternatives meets each of the three response action objectives and four criteria set forth in Task B below.

Task B. Review of Evaluated Alternatives

Upon receipt of the Alternatives Report submitted pursuant to Part VI., Task A, above, the MPCA Director will review the evaluated alternatives and will reject any of the evaluated alternatives that are clearly not feasible or effective. The MPCA Director will notify 3M of the results of the MPCA Director's review within 30 days of receipt of the Alternatives Report.

The purpose of implementing any response action at the 3M Chemolite Disposal Site is to meet the following objectives: (1) to protect the public health, welfare and the environment; (2) to meet the requirements of section 300.68 of the National Oil and Hazardous Substances Contingency Plan; and (3) to meet the requirements of any other applicable Federal or State laws.

In determining whether to reject an evaluated alternative, the MPCA Director will consider the extent to which each of the evaluated alternatives meets each of the objectives stated above and will use the following criteria:

1. Cost

Evaluated alternatives whose estimated costs far exceed those of other evaluated alternatives in relation to the benefits which the evaluated

alternatives will produce will be eliminated, unless 3M explicitly desires to further consider the evaluated alternative.

2. Environmental effects

Evaluated alternatives that inherently present significant adverse environmental effects will be excluded from further consideration.

3. Effectiveness

Evaluated alternatives that do not satisfy the response action objectives and do not contribute significantly to the protection of public health, welfare or the environment will be rejected. On site hazardous substance control alternatives must achieve adequate control of the hazardous substances in terms of abating or minimizing the release or threatened release. Off-site alternatives must minimize or mitigate the threat of harm to public health, welfare or the environment, or they will be excluded from further consideration.

4. Technical Feasibility and Implementability

Evaluated alternatives that may prove extremely difficult to implement, or that rely on unproven technologies will generally be excluded from further consideration. Evaluated alternatives that are not reliable will be excluded from further consideration.

Task C. Detailed Analysis Report

Within 60 days of the MPCA Director's notification of review of the Alternatives Report made pursuant to Part VI, Task B above, 3M shall prepare and submit a Detailed Analysis Report to the MPCA Director on all the evaluated alternatives not rejected by the MPCA Director. The Detailed Analysis Report shall present the following elements for the remaining evaluated alternatives (i.e., evaluated alternatives that are not rejected).

1. Detailed Description.

At a minimum, a detailed description shall include for each remaining evaluated alternative:

a. a description of the appropriate treatment and disposal technology for each remaining evaluated alternative;

b. a description of the special engineering considerations required to implement each remaining evaluated alternative (e.g., for a pilot treatment facility, any additional studies that may be needed to proceed with final response action design);

c. a description of operation, maintenance, and monitoring requirements for each remaining evaluated alternative;

d. a description of off-site disposal needs and transportation plans for each remaining evaluated alternative;

e. a description of temporary storage requirements for each remaining evaluated alternative;

f. a description of safety requirements associated with implementing each remaining evaluated alternative, including both on-site and off-site health and safety considerations;

g. a description of how any of the other remaining evaluated alternatives could be combined with this evaluated alternative and how any of the combinations could best be implemented to produce significant environmental improvements or cost savings; and

h. a description/review of on-site or off-site treatment or disposal facilities for each remaining evaluated alternative which could be utilized to ensure compliance with applicable requirements of the Resource Conservation and Recovery Act, the MPCA hazardous waste rules, and the U.S. and Minnesota Departments of Transportation rules.

2. Environmental Assessment

At a minimum, an environmental assessment shall include an evaluation of the environmental effects, an analysis of measures to mitigate the adverse

effects, the physical or legal constraints, and the compliance with Federal and State regulatory requirements for each remaining evaluated alternative.

Each remaining evaluated alternative shall be assessed in terms of the extent to which it will mitigate damage to, or protect public health, welfare and the environment, in comparison to the other remaining evaluated alternatives.

3. Cost Analysis

A cost analysis shall include a detailed breakdown of the present value capital costs and annualized capital costs of implementing each remaining evaluated alternative (and each phase of each remaining evaluated alternative) as well as the present value annual operating and maintenance costs. The costs shall be presented as both a total cost and an equivalent annual cost.

4. Recommended Evaluated Alternative(s) and Conceptual Design

3M shall include in the Detailed Analysis Report its recommendation for which remaining evaluated alternative (or combination of remaining evaluated alternatives) should be installed or implemented at the 3M Chemolite Disposal Site.

3M shall include in the Detailed Analysis Report a conceptual design for the recommended evaluated alternative (or combination). The purpose of preparing a conceptual design is to illustrate all aspects of the recommended evaluated alternative (or combination) in sufficient detail to enable the MPCA Director to fully evaluate the recommended evaluated alternative (or combination). The conceptual design for the recommended evaluated alternative (or combination) shall include, but not be limited to, the elements listed below. Information which is to be included in the conceptual design, and which has been prepared earlier pursuant to other parts of this Exhibit, may be included by reference.

- A conceptual plan view drawing of the overall site, showing general locations for project actions and facilities.
- Conceptual layouts (plan and cross sectional views where required) for the individual facilities, other items to be installed, or actions to be implemented.
- Conceptual design criteria and rationale.
- A description of types of equipment required, including approximate capacity, size and materials of construction.
- Process flow sheets, including chemical consumption estimates and a description of the process.
- An operational description of process units or other facilities.
- A description of unique structural concepts for facilities.
- A description of operation and maintenance requirements.
- A discussion of potential construction problems.
- Right-of-way requirements.
- A description of technical requirements for environmental mitigation measures.
- Additional engineering data required to proceed with design.
- A discussion of permits that are required pursuant to environmental and other statutes, rules and regulations.
- Order-of-Magnitude implementation cost estimate.
- Order-of-Magnitude annual O&M cost estimates.
- Estimated implementation schedule.

Task D. Approval of Detailed Analysis Report

The MPCA Director shall review and approve, modify, or reject the Detailed Analysis Report based on the objectives and criteria set out in Task B of this Part.

If the MPCA Director approves or modifies the Detailed Analysis Report, the MPCA Director shall so notify 3M.

The the MPCA Director may reject the Detailed Analysis Report for either or both of the following two reasons: (1) inadequate performance of Tasks C.1., C.2. and/or C.3. and (2) presentation under Task C.4. of an unacceptable recommended evaluated alternative and/or conceptual design.

If the MPCA Director rejects the Detailed Analysis Report, for reason (1) above, 3M shall correct the deficiencies and submit a revised Detailed Analysis Report to the MPCA Director within thirty (30) days after receiving a notice of rejection.

If the MPCA Director rejects the Detailed Analysis Report for reason (2) above, 3M shall recommend for review by the MPCA Director another evaluated alternative and conceptual design and shall develop and submit its proposal to the MPCA Director within 30 days after receiving a notice of rejection.

Exhibit B

RESPONSE ACTION PLAN AND RESPONSE ACTION IMPLEMENTATION

I. INTRODUCTION

Part II.C., of the Request for Response Action (RFRA), to which this Exhibit is appended, requires the 3M Company (3M) to prepare a Response Action Plan (RAP) and implement Response Actions (RA's) at 3M Chemolite Disposal Site. This Exhibit sets forth the requirements for preparing the RAP and implementing the RA(s), which have been approved by the MPCA Director pursuant to Part VI, Task D of Exhibit A to the RFRA, and is appended to and made an integral and enforceable part of this RFRA.

II. PREPARATION AND REVIEW OF SUBMITTALS

3M shall submit to the Minnesota Pollution Control Agency Director (MPCA Director) all reports, detailed plans and specifications, work plans, well placement and construction plans, quality assurance/quality control plans, and other submittals required by this Exhibit. The site safety and security plans described in Part IV of this Exhibit do not require MPCA Director approval. All other submittals require MPCA Director approval before implementation.

III. RETAIN CONSULTANT

Within 30 days of notification of approval of the Detailed Analysis Report by the MPCA Director made pursuant to Part VI, Task D of Exhibit A to the RFRA, 3M shall retain a consultant(s) qualified to undertake and complete the requirements of this Exhibit and shall notify the MPCA Project Leader of the name of that consultant(s).

IV. SITE SECURITY AND SAFETY PLANS

3M shall prepare and submit to the MPCA Director for comment (1) a 3M Chemolite Disposal Site security plan to limit and control the general public's access to the 3M Chemolite Disposal Site and (2) a 3M Chemolite Disposal Site

safety plan to protect the health and safety of personnel involved in implementing the RA's.

The 3M Chemolite Disposal Site security and safety plans shall be submitted at the same time that the proposed RAP is submitted, pursuant to Part V, below. At a minimum, the 3M Chemolite Disposal Site safety plan shall incorporate and be consistent with the requirements of:

1. Section 111(c)(6) of CERCLA;
2. EPA Order 1440.3 -- Respiratory Protection;
3. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
4. EPA Occupational Health and Safety Manual;
5. OSHA Requirements (29 CFR 1901 and 1926);
6. Interim Standards Operating Safety Guide (Revised September, 1982) by the Office of Emergency and Remedial Response.

3M Chemolite Disposal Site security and safety are the responsibility of 3M. The MPCA Director may comment on the 3M Chemolite Disposal Site security and safety plans but will neither approve nor disapprove those plans.

3M shall implement the 3M Chemolite Disposal Site security and safety plans, taking into account the comments of the MPCA Director, if any, when it implements the RA's, pursuant to Part VI, below. 3M shall ensure that no lapse in 3M Chemolite Disposal Site security or safety occurs in the time interval between completion of RI/FS actions at the 3M Chemolite Disposal Site and the implementation of this Part IV.

V. RAP WORK PLAN

Within 30 days of retaining a consultant pursuant to Part III above, 3M shall prepare and submit to the MPCA Director for review and approval, modification, or rejection a work plan (RAP Work Plan) for preparation of a RAP. The RAP Work Plan shall, at a minimum, specify all of the work products which

must be produced and subjects which must be addressed in the RAP in order to perform the response action(s) approved by the MPCA Director pursuant to Part VI, Task D of Exhibit A to the RFRA. At a minimum, the RAP Work Plan shall include proposed methodologies and time schedules for all subjects which are listed in Part VI below. If the RAP Work Plan is rejected, 3M shall correct the deficiencies and submit a revised RI Work Plan to the MPCA Director within fourteen (14) days after receiving a notice of rejection.

VI. RESPONSE ACTION PLAN

3M shall prepare a proposed RAP which accomplishes the purposes and meets the requirements of this Part. The proposed RAP shall be prepared in accordance with the methodologies and time schedules in the RAP Work Plan, as approved or modified by the MPCA Director, and shall be submitted to the MPCA Director for review and approval, modification or rejection within 60 days of the notice of approval or modification of the RAP Work Plan. The purpose of the RAP is to provide a detailed design of RA(s) which, upon implementation, will protect the public health, welfare, and the environment from the threatened or actual release of hazardous substances associated with the 3M Chemolite Disposal Site. The proposed RAP shall consist of the following three Tasks.

Task A. Remedial Design

As part of the proposed RAP, 3M shall submit a proposed remedial design for the 3M Chemolite Disposal Site for the RA(s) approved by the MPCA Director pursuant to Part VI, Task D of Exhibit A to the RFRA. The purpose of the remedial design is to specify detailed methods and time schedules for the approved RA(s) at the 3M Chemolite Disposal Site. The remedial design shall include, but not be limited to, construction plans and specifications, excavation methods, disposal methods, closure and post-closure plans, a plan to assess the effectiveness of the RA(s), contingency plans, etc.

Task B. Quality Assurance/Quality Control Plan

As part of the proposed RAP, 3M shall submit a proposed Quality Assurance/Quality Control Plan (QA/QC Plan) to be utilized during implementation of the RA(s) and during long term monitoring of the effectiveness of the implemented RA(s). The proposed QA/QC Plan shall be prepared so as to be consistent with the requirements of the U.S. EPA's Contract Laboratory Program. The proposed QA/QC Plan shall specify the procedures for:

a. field protocol including procedures for chain-of-custody, sample collection and transportation and storage of samples;

b. calibration in terms of accuracy, precision, and references (the QA/QC Plan shall also specify the number of times and intervals at which analysis equipment will be calibrated);

c. laboratory analytical methods, including methods for ensuring accurate measurements of data in terms of precision, accuracy, completeness, and comparability;

d. reporting;

e. internal quality control;

f. audits;

g. preventive maintenance;

Task C. Response Action Monitoring Plan

As part of the proposed RAP, 3M shall submit a proposed long term response action monitoring plan (Monitoring Plan) for the 3M Chemolite Disposal Site. The purpose of the Monitoring Plan is to specify all long term monitoring of air, surface water, sludges, soils, and ground water, which is necessary to determine the status and effectiveness of the RA(s) to be implemented at and near the 3M Chemolite Disposal Site. The Monitoring Plan shall, at a minimum, contain the following:

1. Analytical Parameter List

3M shall propose a list of parameters including water level measurements that shall be monitored or analyzed for as part of the Monitoring Plan.

2. Monitoring Facility Location and Design

3M shall propose the design and location of all monitoring facilities including both on-site and off-site wells and surface water stations that shall be included in the Monitoring Plan.

3. Sampling Schedule

3M shall propose a sampling schedule for the parameters proposed in the Monitoring Plan for all monitoring locations.

4. Reporting Plan

3M shall propose a plan for reporting the results of long term monitoring to the MPCA. The reporting plan shall, at a minimum, contain the following:

a. Quarterly Monitoring Reports

3M shall submit the analytical and water level results to the MPCA Director quarterly by the tenth day of each third month following the sampling for all analyses completed during the previous quarter.

b. Annual Monitoring Reports

3M shall submit an Annual Monitoring Report to the MPCA Director on or before January 1, 1987 and each January 1 thereafter for a minimum of five (5) years from the effective date of the Request for Response Action. The Annual Monitoring Report shall contain the following information:

(1) The results of all water level measurements and parameter analyses for the previous year;

(2) A water level contour map for the regional ground water aquifer for high and low piezometric and surface water elevations;

(3) A map showing each well with the concentration of pollutants for each sampling event;

(4) Graphs illustrating the concentrations over time using data from each sampling event (this graph shall be cummulative showing water quality for all previous years as well as the reporting year); and

(5) A sampling plan for the next year with an assessment of the monitoring parameters, sampling frequencies, and the need for the addition or deletion of monitoring wells.

VII. APPROVAL OF THE RAP

The MPCA Director shall review and approve, modify or reject the proposed RAP which is submitted pursuant to Part VI above.

If the MPCA Director approves or modifies the proposed RAP, the MPCA Director shall so notify 3M. If the MPCA Director rejects the proposed RAP, the MPCA Director shall notify 3M and specify the deficiencies and reasons for rejection. 3M shall correct the deficiencies and resubmit the proposed RAP to the MPCA Director within fourteen (14) days of the notification of rejection.

VIII. RESPONSE ACTION IMPLEMENTATION

3M shall implement the RA(s) specified in the RAP as approved by the MPCA Director pursuant to Part VII above in a manner which accomplishes the purposes and meets the requirements of this Part. The purpose of RA implementation is to take those actions which will protect the public health, welfare, and the environment from the threatened or actual release of hazardous substances associated with the 3M Chemolite Disposal Site. The requirements for RA implementation are set forth in the three Tasks below.

Task A. Conduct RA(s)

Within 30 days of receipt of the MPCA Director's notification, pursuant to Part VII above, of approval or modification of the RAP, 3M shall initiate implementation of the RA(s). 3M shall implement the RA(s) in accordance with

the methodolgies and time schedules set forth in the RAP as approved or modified by the MPCA Director. The RA implementation shall be conducted in accordance with all federal, state, and local laws, rules, regulations and ordinances.

Task B. Report Results of RA Implementation

Within 30 days of the completion of the implementation of the RA(s) specified in the approved RAP, 3M shall prepare and submit to the MPCA Director an RA Final Report which includes the following:

(1) the data and results of the RA implementation;

(2) the follow-up actions, if any, which will be taken in the following 1 year period;

(3) a certification that all work plans, specifications and schedules have been implemented and completed in accordance with the RAP as approved by the MPCA Director; and

(4) an identification of difficulties encountered during the RA implementation which may impair or otherwise reduce the effectiveness of the RA implementation to minimize or mitigate the release or threatened release of hazardous substances from the 3M Chemolite Disposal Site, or which may require unanticipated operational or maintenance actions to maintain the effectiveness of any of the implemented RA's.

Task C. Approval of the RA Final Report

The MPCA Director shall review the RA Final Report submitted pursuant to Task B above, determine whether 3M's obligations under this Exhibit have been satisfactorily completed, and notify 3M. If the MPCA Director determines that 3M's obligations under this Exhibit have not been satisfactorily completed, 3M shall correct any deficiencies and resubmit the RA Final Report within 30 days of the notification of the MPCA Director's determination.

If the MPCA Director determines that related and follow-up actions, which were not specified in the approved RAP, including monitoring and periodic submittal of status reports, are necessary at the 3M Chemolite Disposal Site, 3M shall perform the follow-up actions as directed by the MPCA Director.

Attachment 3: Location of the 3M Chemolite Disposal Site