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- (3) Upon receipt of U.S. EPA's written approval of any workplan, Respondent shall commence work and implement any approved workplan in accordance with the schedule and provisions contained therein.
- (4) Any workplan, report, specification, or schedule submitted for approval to U.S. EPA for a third time (one original submittal and two revised submittals) that incorporates a deficient response to U.S. EPA comments shall be deemed a violation of this Order, unless waived by U.S. EPA in writing.
- (5) Any U.S. EPA approved report, workplan, specification, or schedule shall be deemed incorporated into this Order. Prior to U.S. EPA's written approval, no workplan, report, specification, or schedule shall be construed as approved and final. Oral advice, suggestions, or comments given by U.S. EPA representatives will not constitute official approval, nor shall any oral approval or oral assurance of approval be considered binding.

3. PROPOSED CONTRACTOR/CONSULTANT

All work performed by Respondent pursuant to this Order shall be under the direction and supervision of a professional engineer, hydrologist, geologist, or environmental scientist with expertise in hazardous waste cleanup. Respondent's contractor or consultant shall have technical expertise sufficient to adequately perform all aspects of the work for which it is responsible. Within 14 days of the effective date of this Order, Respondent shall notify the EPA Project Coordinator in writing of the name, title, and qualifications of the engineer, hydrologist, geologist, or environmental scientist and of any contractors or consultants and their personnel to be used in carrying out the terms of this Order. Respondent shall identify whether

any contractor is on the List of Parties Excluded from Federal Procurement or non-Procurement Programs. U.S. EPA reserves the right to disapprove Respondent's contractor and/or consultant at any time during the period that this Order is effective. If U.S. EPA disapproves a contractor or consultant, then Respondent must, within sixty (60) days of receipt from U.S. EPA of written notice of disapproval, notify U.S. EPA, in writing, of the name, title, and qualifications of any replacement.

C. ADDITIONAL WORK

EPA may determine, or Respondent may propose, that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to or in lieu of the tasks included in any U.S. EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section IV: Statement of Purpose. If U.S. EPA determines that Respondent shall perform additional work, EPA will notify Respondent in writing and specify the basis for its determination that the additional work is necessary. Within thirty (30) days after the receipt of such determination, Respondent shall have the opportunity to meet or confer with U.S. EPA to discuss the additional work. If required by U.S. EPA, Respondent shall submit for U.S. EPA approval a workplan for the additional work. U.S. EPA will specify the contents of such a workplan. Such workplan shall be submitted within thirty (30) days of receipt of U.S. EPA's determination that additional work is necessary, or according to an alternative schedule established by U.S. EPA. Upon approval of such a workplan by U.S. EPA, Respondent shall implement it in accordance with the schedule and provisions contained therein.

D. DISPUTE RESOLUTION

- (1) If Respondent disagrees, in whole or in part, with U.S. EPA's disapproval or modification of any workplan, report, or other submission required pursuant to Section VII.A. of this Order (except for oral and written reports required by paragraphs (3)(a) and (4) of Section VII.A), Respondent shall notify U.S. EPA by providing the Region 5 Waste Management Division Director with a written statement of its position within fourteen (14) days of Respondent's receipt of U.S. EPA's disapproval or modification. Respondent shall provide, on the same day, one copy of this written statement of position to the U.S. EPA Project Coordinator. Respondent's statement of position shall set forth the specific matters in dispute, the position Respondent asserts should be adopted as consistent with the requirements of this Order, and the basis for Respondent's position, and shall include any supporting documentation.
- (2) U.S. EPA and Respondent shall have an additional fourteen (14) days from U.S. EPA's receipt of Respondent's statement of position to meet or confer to attempt to resolve the dispute. If agreement is reached, Respondent shall submit a revised workplan, report, or other submission, if necessary, and shall implement the submission in accordance with such agreement.
- (3) If U.S. EPA and Respondent are not able to reach agreement within the fourteen-day period, the Regional Administrator, Region 5, or his or her delegatee (who shall not be below the division director level and shall not be the division director authorized to issue

unilateral orders pursuant to Section 3008(h) of RCRA) will thereafter issue a written decision resolving the dispute which shall become an enforceable condition of this Order, and Respondent shall comply with the terms and conditions of U.S. EPA's decision resolving the dispute.

- (4) Notwithstanding the invocation of these dispute resolution procedures, Respondent shall proceed to take any action required by those portions of the modified or approved workplan, report, or other submission that U.S. EPA determines are not substantially affected by the dispute, according to the schedule contained in the submission.

X. PUBLIC COMMENT AND PARTICIPATION

A. EPA will provide the public with an opportunity to review and comment on the final draft of the Corrective Measures Study Report and a description of EPA's proposed corrective measure(s), including U.S. EPA's justification for proposing such corrective measure(s) (the "Statement of Basis").

B. Following the public comment period, EPA may approve the Corrective Measures Study Report and select one or more final corrective measure(s) or EPA may require Respondent to revise the Report and/or perform additional corrective measures studies.

C. EPA will notify Respondent of the final corrective measure(s) selected by U.S. EPA in the Final Decision and Response to Comments ("RTC"). If the final corrective measure(s) selected are different from the corrective

measure(s) selected by U.S. EPA prior to the public comment period, the notification will include U.S. EPA's reasons for selecting the different final corrective measure(s).

XI. ACCESS

A. To the extent necessary to monitor Respondent's compliance with this Order, U.S. EPA, its contractors, employees, and/or duly designated EPA representatives are authorized to enter and freely move about the Facility during the effective dates of this Order for the purposes of, inter alia: interviewing Facility personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of Respondent in carrying out the terms of this Order; conducting such tests, sampling, or monitoring as U.S. EPA deems necessary; using a camera, sound recording, or other documentary type equipment; and verifying the reports and data submitted to U.S. EPA by Respondent. Respondent shall provide to U.S. EPA and its representatives access at all reasonable times to the Facility and subject to paragraph B below, to any other property to which access is required for implementation of this Order. Respondent shall permit such persons to inspect and copy all records, files, photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Order and that are within the possession or under the control of Respondent or its contractors or consultants.

B. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain access agreements necessary to complete work required by this Order from the present owner(s) of such property within thirty (30) days of the date that the need for access becomes known to Respondent. Best

efforts as used in this paragraph shall include, at a minimum, a certified letter from Respondent to the present owner(s) of such property requesting access agreement(s) to permit Respondent and its authorized representatives to access such property. Any such access agreement shall provide for access by U.S. EPA and its representatives. Respondent shall insure that EPA's Project Coordinator has a copy of any access agreement(s). In the event that agreements for access are not obtained within thirty (30) days of approval of any workplan for which access is required, or of the date that the need for access became known to Respondent, Respondent shall notify U.S. EPA in writing within fourteen (14) days thereafter of both the efforts undertaken to obtain access and the failure to obtain access agreements. U.S. EPA may, at its discretion, assist Respondent in obtaining access. In the event U.S. EPA obtains access, Respondent shall undertake U.S. EPA-approved work on such property.

C. As provided in Section XX. United States Not Liable, the United States and the U.S. EPA do not assume any liability for any claims or causes of action arising from activities of Respondent or Respondent's representatives on property within or property beyond the Facility boundary.

D. Nothing in this Section limits or otherwise affects U.S. EPA's right of access and entry pursuant to applicable law, including RCRA and CERCLA.

E. Nothing in this Section shall be construed to limit or otherwise affect Respondent's liability and obligation to perform corrective action including corrective action beyond the Facility boundary, notwithstanding the lack of access.

XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. The Respondent shall submit to U.S. EPA upon request the results of all sampling and/or tests or other data generated by divisions, agents, consultants, or contractors pursuant to this Order.

B. Notwithstanding any other provisions of this Order, the United States retains all of its information gathering and inspection authorities and rights, including the right to bring enforcement actions related thereto, under RCRA, CERCLA, and any other applicable statutes or regulations.

C. Respondent shall notify U.S. EPA in writing at least fourteen (14) days prior to beginning each separate phase of field work approved under any workplan required by this Order. If Respondent believes it must commence emergency field activities without delay, Respondent may seek emergency telephone authorization from the U.S. EPA Project Coordinator or, if the Project Coordinator is unavailable, his/her Section Chief, to commence such activities immediately. At the request of U.S. EPA, Respondent shall provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples collected by Respondent pursuant to this Order. Similarly, at the request of Respondent, U.S. EPA shall allow Respondent or its authorized representative(s) to take split or duplicate samples of all samples collected by U.S. EPA under this Order.

D. Respondent may assert a business confidentiality claim covering all or part of any information submitted to U.S. EPA pursuant to this Order. Any assertion of confidentiality must be accompanied by information that satisfies the items listed in 40 CFR 2.204(e)(4) or such claim shall be deemed waived. Information determined to be confidential by U.S. EPA shall be disclosed only to the extent permitted by 40 CFR Part 2. If no such confidentiality claim

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accompanies the information when it is submitted to U.S. EPA, the information may be made available to the public by U.S. EPA without further notice to the Respondent. Respondent shall not assert any confidentiality claim with regard to any physical or analytical data.

E. Respondent may assert that information is privileged under the attorney-client privilege, attorney work product doctrine, or any other privilege recognized by Federal law. Respondent shall not, however, claim analytical data to be privileged or confidential. If Respondent asserts that documents, records, or other information are privileged, in lieu of providing such documents, records, or information Respondent shall provide U.S. EPA with the following: (1) the title of the document, record, or other information; (2) the date of the document, record, or other information; (3) the name and title of the author of the document, record, or other information; (4) the name and title of each addressee and recipient of the document, record, or information; (5) any description of the subject of the document, record, or information; (6) the privilege asserted. If a claim of privilege applies only to a portion of a document or record, the document or record shall be provided to U.S. EPA in redacted form to exclude the privileged information only.

XIII. RECORD PRESERVATION

A. Respondent shall retain, during the pendency of this Order and for a minimum of six (6) years after its termination, all data, records, and documents now in its possession or control which relate in any way to this Order or to hazardous waste management and/or disposal at the facility. Respondent shall notify U.S. EPA in writing 90 days prior to the destruction of any such records, and shall provide U.S. EPA with the opportunity to take possession of any such records. Such written notification shall reference the

effective date, caption, and docket number of this Order and shall be addressed to:

Project Coordinator for MID 041 793 340
RCRA Enforcement Branch (HRE-8J)
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

B. Respondent shall, within thirty (30) days of retaining or employing any agent, consultant, or contractor for the purpose of carrying out the terms of this Order, enter into an agreement with any such agents, consultants, or contractors whereby such agents, consultants, and/or contractors, will be required to provide to Respondent a copy of all documents produced pursuant to this Order.

C. All documents pertaining to this Order shall be stored by the Respondent in a centralized location at the Facility to afford ease of access by U.S. EPA or its representatives.

XIV. PROJECT COORDINATOR

A. Within ten (10) days of the effective date of this Order, the U.S. EPA and Respondent shall each designate a Project Coordinator. Respondent shall notify U.S. EPA in writing of the Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Order and for designating a person to act in his/her absence. The U.S. EPA Project Coordinator will be U.S. EPA's designated representative at the Facility. All communications between the Respondent and the U.S. EPA, and all documents, reports, approvals and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Coordinators.

B. Respondent shall provide at least seven (7) days written notice prior to changing its Project Coordinator.

C. The absence of the U.S. EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

XV. REPORTING AND DOCUMENT CERTIFICATION

A. Beginning with the first full month following the effective date of this Order, and throughout the period that this Order is effective, Respondent shall provide U.S. EPA with monthly progress reports. Progress reports are due on the tenth day of every subsequent month. The progress reports shall conform to requirements in the relevant Scope of Work contained in Attachments II through III. U.S. EPA may adjust the frequency of progress reports to be consistent with site-specific activities.

B. All documents submitted pursuant to this Order shall be in writing and shall be hand delivered, sent by certified mail, return receipt requested, or sent by overnight express mail to:

1. Two copies of all documents to be submitted to the U.S. EPA shall be sent to:

Project Coordinator MID 041 793 340
RCRA Enforcement Branch (HRE-8J)
U.S. Environmental Protection Agency, Region V
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

2. One copy of all documents to be submitted to the U.S. EPA shall be sent to:

Jim Sygo, Chief
Waste Management Division
Michigan Department of Natural Resources
P.O. Box 30241
Lansing, Michigan 48909

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District Supervisor
Waste Management Division
Michigan Department of Natural Resources
503 N. Euclid
Bay City, Michigan 48706

Dr. Lisa Williams
East Lansing Field Office, Fish and Wildlife Service
U.S. Department of the Interior
1405 S. Harrison Road, Room 302
East Lansing, Michigan 48623

Other addressees can also be designated by U.S. EPA's Project Coordinator.

All documents submitted pursuant to this Order shall be printed on recycled paper (preferably three-hole punched and unbound) and shall be copied double-sided whenever practicable.

C. Any report or other document submitted by Respondent pursuant to this Order which makes any representation concerning Respondent's compliance or noncompliance with any requirement of this Order shall be certified by a responsible corporate officer of Respondent or a duly authorized representative. A responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation.

D. The certification required by paragraph C (above) shall be in the following form:

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are

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significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____

Name: _____

Title: _____

Date: _____

XVI. PENALTIES FOR NONCOMPLIANCE

If Respondent fails to comply with the terms and provisions of this Order, EPA may commence a civil action to require compliance and to assess a civil penalty not to exceed \$25,000 for each day of non-compliance in the appropriate United States District Court, may issue another order, or may take any other action authorized by Section 3008 of RCRA, 42 U.S.C. §6928.

XVII. RESERVATION OF RIGHTS

A. The U.S. EPA reserves the right to disapprove of work performed by Respondent pursuant to this Order and to order that Respondent perform additional tasks.

B. U.S. EPA reserves all of its statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including without limitation the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. §6928(h)(2). The Order shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which U.S. EPA has under RCRA, CERCLA, or any other statutory, regulatory, or common law enforcement authority of the United States.

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C. U.S. EPA reserves the right to perform any portion of the work required herein or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. U.S. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, EPA reserves its right to seek reimbursement from Respondent for costs incurred by the United States. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for the costs of any response actions taken or authorized by U.S. EPA.

D. The entry of this Order shall not limit or otherwise preclude the U.S. EPA from taking additional enforcement action pursuant to Section 3008(h) of RCRA should the U.S. EPA determine that such actions are warranted.

E. U.S. EPA reserves all of its statutory rights to take other enforcement action against Respondent, including bringing civil action in the appropriate United States district court or issuing orders under any other provision of RCRA, including but not limited to section 7003 of RCRA, CERCLA, or any other applicable Federal, state, or local laws or regulations.

F. If U.S. EPA determines that activities in compliance with this Order have caused or may cause a release of hazardous waste or hazardous constituent(s), or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work ordered, U.S. EPA may order Respondent to stop further implementation of this Order for such period of time as EPA determines may be needed to abate any such release or threat and/or to undertake any action which U.S. EPA determines is necessary to abate such release or threat.

G. This Order is not intended to be nor shall it be construed to be a permit. Further, U.S. EPA's approval of the SOW or any final workplan does not constitute a warranty or representation that the SOW or workplans will achieve the required cleanup or performance standards. Compliance with the terms of this Order shall not relieve Respondent of its obligations to comply with RCRA or any other applicable local, State, or Federal laws and regulations.

XVIII. OTHER CLAIMS AND PARTIES

Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity against any person, firm, partnership, or corporation for any liability it may have arising out of, or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility.

XIX. OTHER APPLICABLE LAWS

All actions required to be taken by the Respondent pursuant to this Order shall be undertaken in accordance with the requirements of all applicable local, State, and Federal laws and regulations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations.

XX. UNITED STATES NOT LIABLE

The United States and U.S. EPA are not to be construed as parties to, and do not assume any liability for, any contract entered into by Respondent to carry out any work pursuant to this Order. The proper completion of the work under

this Order is solely the responsibility of Respondent. The United States and U.S. EPA, by issuance of this Order, also assume no liability for any injuries or damages to persons or property resulting from acts or omissions of Respondent or Respondent's directors, officers, employees, agents, representatives, successors, assigns, contractors, subcontractors, or consultants in carrying out any action or activity required by this Order or necessary to complete the work required by this Order.

XXI. MODIFICATION

A. Any modifications of this Order shall be made only as consistent with paragraph C of this Section, shall be in writing, shall have as their effective date the date on which they are signed by U.S. EPA, and shall be incorporated into this Order.

B. Any reports, plans, specifications, schedules, and attachments required by this Order are, upon written approval by U.S. EPA, incorporated into this Order. Unless there is an approved modification as provided in paragraph C of this Section, any noncompliance with such U.S.EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a violation of this Order and shall subject Respondent to the statutory penalty provisions included in Section XVI of this Order.

C. Any requests by Respondent for a compliance date modification and/or revision of an approved workplan requirement must be made in writing and be received by EPA at least ten (10) days prior to the applicable deadline. Such requests must provide justification for any proposed compliance date modification or workplan revision. EPA has no obligation to approve such requests, but if it does so, such approval and the modification or revision must be in writing from the U.S. EPA Compliance Coordinator. Any approved

compliance date modification shall be incorporated by reference into the Order. Such a modification would not alter other due dates, unless so stated by EPA in its written approval, modification, or revision.

D. No informal advice, guidance, suggestions, or comments by U.S. EPA regarding reports, plans, specifications, schedules or any other writing submitted by the Respondent will be construed as relieving Respondent of its obligation to obtain written approval, if and when required by this Order.

XXII. SEVERABILITY

If any provision or authority of this Order or the application of this Order to any party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other parties or circumstances and the remainder of the Order shall remain in force and shall not be affected thereby.

XXIII. NOTICE OF OPPORTUNITY TO REQUEST A HEARING

In accordance with Section 3008(b) of RCRA, 42 U.S.C. Section 6928(b), and 40 CFR 24.05, this Order shall become final unless Respondent files a response and a request for a public hearing in writing no later than (30) days after service of this Order and Notice of Opportunity for Hearing. The response and request for hearing must be filed with:

Regional Hearing Clerk (MF-10J)
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

A copy of the written response and request for hearing and copies of all subsequent documents filed in this action must be sent to:

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Jacqueline Kline, Esq.
Office of Regional Counsel (CS-29A)
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

The response must specify each actual or legal determination or relief provision in the Order that it disputes and shall specify the basis upon which it disputes such determination or provision. Any hearings on the Order will be conducted in accordance with the attached rules governing Administrative Hearings on Orders Requiring Investigations or Studies (40 CFR Part 24, Subpart B).

XXIV. SETTLEMENT CONFERENCE

Whether or not Respondent requests a hearing, an informal settlement conference may be requested at any time in order to discuss the facts of this case, this Order, and potential settlement. To request an informal conference contact:

Jacqueline Kline, Esq.
Office of Regional Counsel (CS-29A)
U.S. EPA, Region V
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

A request for an informal settlement conference does not extend the thirty (30) day period during which a written response and request for a hearing must be submitted. The informal conference procedure may be pursued simultaneously with the public hearing procedure.

XXV. ACCESS TO ADMINISTRATIVE RECORD

The RCRA Section 3008(h) Administrative Record supporting this Order is available for review on normal business days between the hours of 9:00 a.m. and 4:30 p.m. at the office of the Regional Hearing Clerk, U.S. EPA, Region V,

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77 West Jackson Boulevard, Chicago, Illinois. To review the Administrative Record contact the Regional Hearing Clerk at (312) 886-3617 or Assistant Regional Counsel Jacqueline Kline at (312) 886-7167. An Index of the Administrative Record is Attachment V to this Order.

XXVI. SURVIVABILITY/PERMIT INTEGRATION

Except as otherwise expressly provided in this section, this Order shall survive the issuance or denial of a RCRA permit for the facility, and this Order shall continue in full force and effect after either the issuance or denial of such permit. Accordingly, Respondent shall continue to be liable for the performance of obligations under this Order notwithstanding the issuance or denial of such permit. If the Respondent is issued a RCRA permit for this Facility and that permit expressly incorporates all or a part of the requirements of this Order, or expressly states that its requirements are intended to replace some or all of the requirements of this Order, Respondent may request a modification of this Order and shall, with written U.S. EPA approval, be relieved of liability under this Order for those specific obligations.

XXVII. SUBMITTAL SUMMARY

The following is a summary of the major deadlines required by this Order. To the extent that this section is inconsistent with any other section of this Order, such other section rather than this summary shall prevail.

Section	Action	Due Date
XIV.	Designate a Project Coordinator and notify U.S. EPA in writing	Within ten days of this Order becoming final
VII.B.1.	Submit Description of Current Conditions Report	Within 45 days of this Order becoming final
VII.B.2.-5.	Submit RFI Workplan	Within 120 days of this Order becoming final
VII.C.1	Submit CMS Workplan	Within 10 days of EPA approval of final RFI report or upon request
VII.A.3	Notify U.S. EPA of any new or additional information posing a current or potential threat	Within 48 hours orally, and 14 days in writing, of discovery
VII.B.8	Submit RFI Report	As scheduled in approved RFI workplan
VII.C.3	Submit CMS Report	As scheduled in approved CMS workplan
XV.	Submit monthly progress reports	On the 10th day of each subsequent month
IX.A.5.	Implement approved workplans	In accordance with the schedules in the approved workplans
IX.E.	Notify U.S. EPA in writing of any contractors or consultants	Within 14 days of this Order becoming final
VIII.D.	Inform Project Coordinator which laboratories will be used	Within 60 days of this Order becoming final (for RFI)
XII.C.	Notify U.S. EPA in writing before engaging in any field activities	14 days prior to beginning each phase
III.D.	Notify U.S. EPA of transfer of ownership	30 days prior to such scheduled transfer
XI.B.	Obtain access agreements	Within 30 days of knowledge of the need for access
VII.A.3.&4.	Provide an IM Workplan	Within 30 days of U.S. EPA's request

XXVIII. TERMINATION AND SATISFACTION

The provisions of this order shall be deemed satisfied upon Respondent's receipt of written notice from U.S. EPA that Respondent has demonstrated, to the satisfaction of U.S. EPA, that the terms of this Order, including any additional tasks determined by U.S. EPA to be required pursuant to this Order, have been satisfactorily completed.

The provisions of this Order shall be deemed satisfied upon Respondent's and EPA's execution of an "Acknowledgement of Termination and Agreement to Record Preservation and Reservation of Rights" ("Acknowledgement"). EPA will prepare the Acknowledgement for Respondent's signature. The Acknowledgement will specify that Respondent has demonstrated to the satisfaction of EPA that the terms of this Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed.

Respondent's execution of the Acknowledgement will affirm Respondent's continuing obligation (1) to preserve all records as required in Section XIII: Record Preservation and (2) to recognize U.S. EPA's reservation of rights as required in Section XVII: Reservation of Rights, after all other requirements of the Order are satisfied. The acknowledgement required by this section shall be as follows:

ACKNOWLEDGEMENT OF TERMINATION and
AGREEMENT TO RECORD PRESERVATION AND RESERVATION OF RIGHTS

1. The United States Environmental Protection Agency ("U.S. EPA") agrees and acknowledges that the terms of Order RCRA-____-____-____ issued by U.S. EPA on _____, 19____ ("the Order"), including any additional tasks determined by U.S. EPA to have been required pursuant to the Order, but excluding Section XIII: Record Preservation, have been satisfactorily completed based upon the information presently available to U.S. EPA.

2. Respondent agrees and acknowledges that the terms of Section XIII: Record Preservation remain in effect until _____, 20__ (date 6 years after termination of the Order).

3. Respondent agrees and acknowledges that Respondent's completion of the terms of the Order does not limit or otherwise preclude U.S. EPA from taking additional enforcement action pursuant to Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act of 1976 ("RCRA"), as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §6928(h), or other available legal authorities, should U.S. EPA determine that such actions are warranted.

4. Respondent agrees and acknowledges that Respondent's completion of the terms of the Order does not relieve Respondent of its obligations to comply with RCRA or any other applicable local, State, or Federal laws and regulations.

IT IS SO AGREED AND ACKNOWLEDGED:

Date: _____ By: _____
(Name)
(Title)
(RESPONDENT)

Date: _____ By: _____
(Name)
(Title)
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
(Petitioner)

XXIX. EFFECTIVE DATE

This Order shall become final thirty (30) days after it is served unless Respondent requests a public hearing pursuant to RCRA Section 3008(b), 42 U.S.C. Section 6928(b).

IT IS SO ORDERED:

BY: Wm. E. Muno _____ Date 5/24/95

U.S. Environmental Protection Agency
 William E. Muno, Director
 Waste Management Division
 U.S. EPA, Region V
 Petitioner

U.S. EPA ID No. MID 041 793 340
 U.S. EPA Docket Number V-W-003-95

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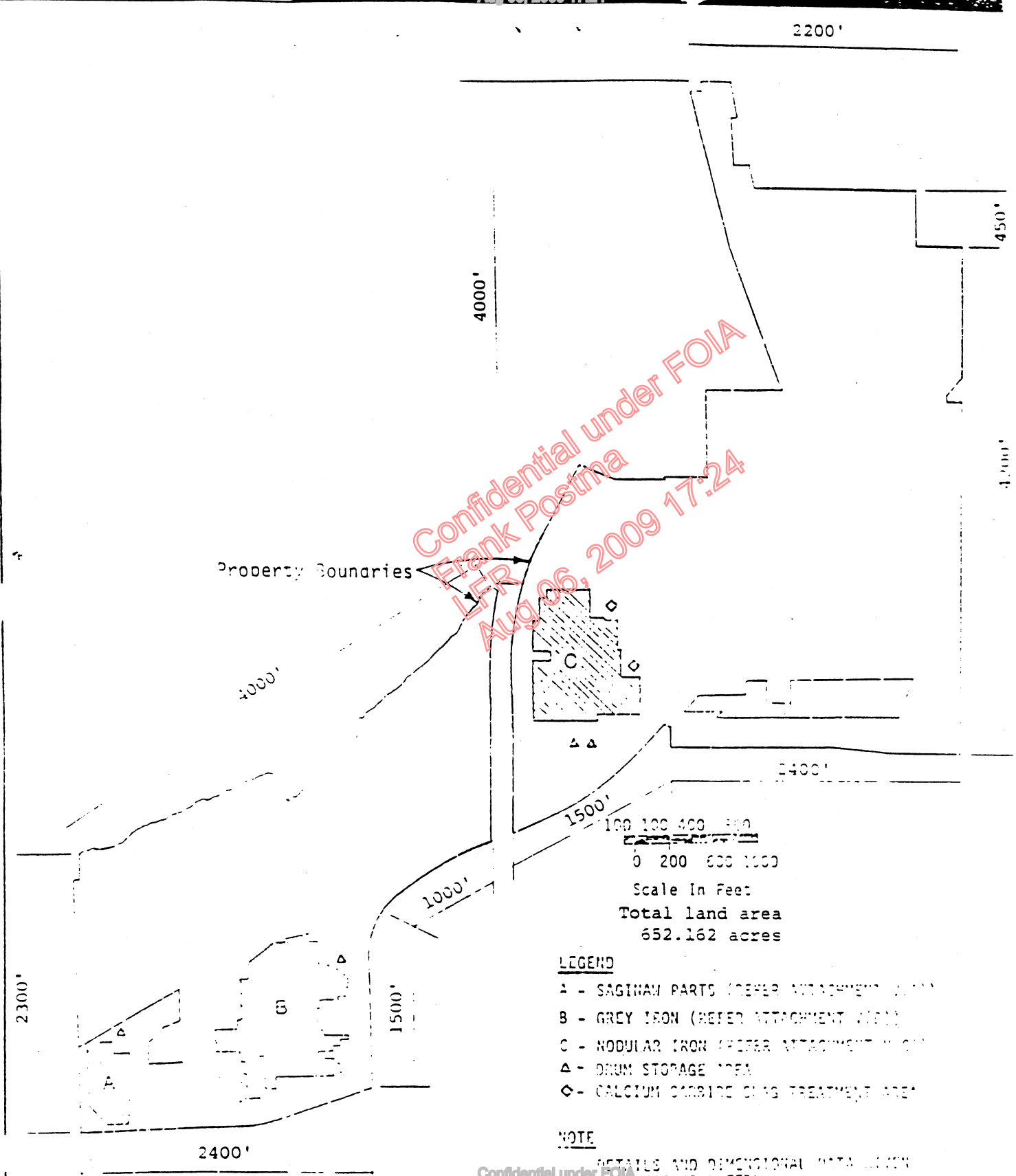
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V FACILITY DRAWING (see page 4)

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LEGEND

- A - SAGINAW PARTS (REFER ATTACHMENT 1)
- B - GREY IRON (REFER ATTACHMENT 1)
- C - NODULAR IRON (REFER ATTACHMENT 1)
- △ - DRUM STORAGE AREA
- ◇ - CALCIUM CARBIDE SLAG TREATMENT AREA

NOTE

DETAILS AND DIMENSIONAL DATA SHOWN IN ATTACHED SHEETS.

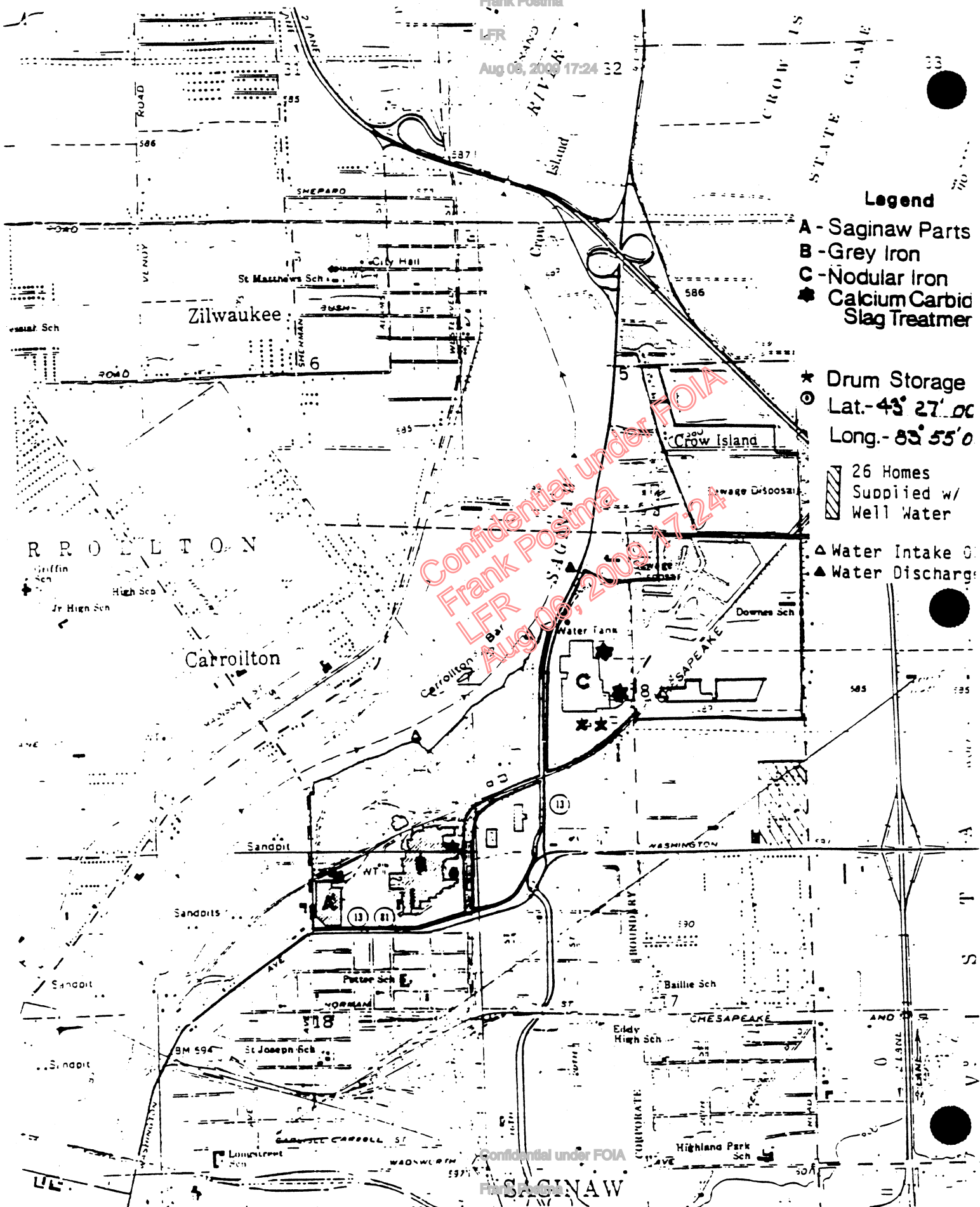
Figure 1a. Facility lay-out including the Saginaw Parts Plant, Grey Iron Plant, Nodular Iron Plant, and general location of regulated units. From November 17, 1980 Part A permit application.

EPA ID Number: MID041793340

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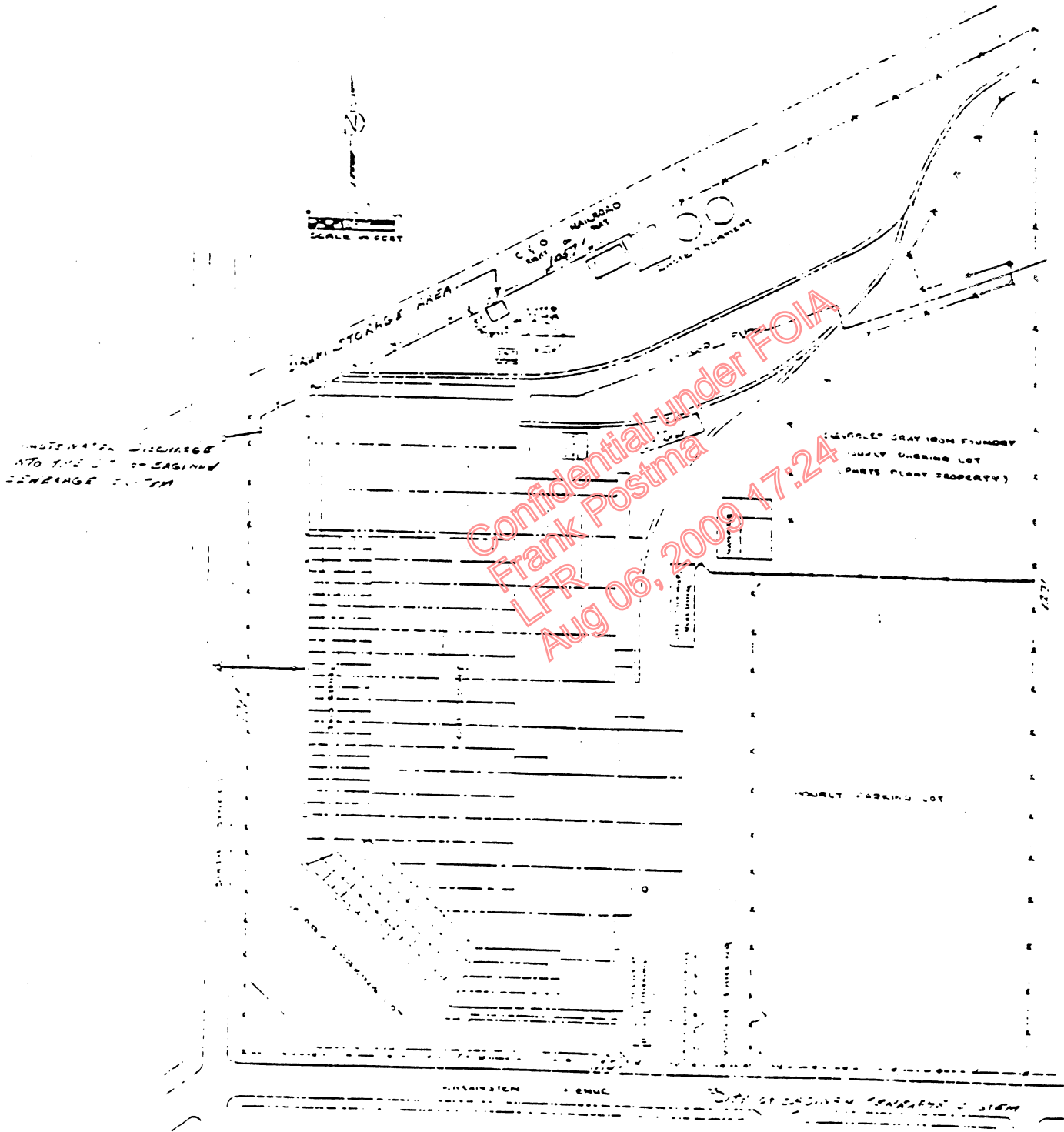
Figure 1b. Photocopy of Facility Location on Saginaw Quadrangle (U.S.G.S. 7.5 minute series topographic map, photorevised 1973), T12N, R5E.

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Attachment (A)
Saginaw Parts

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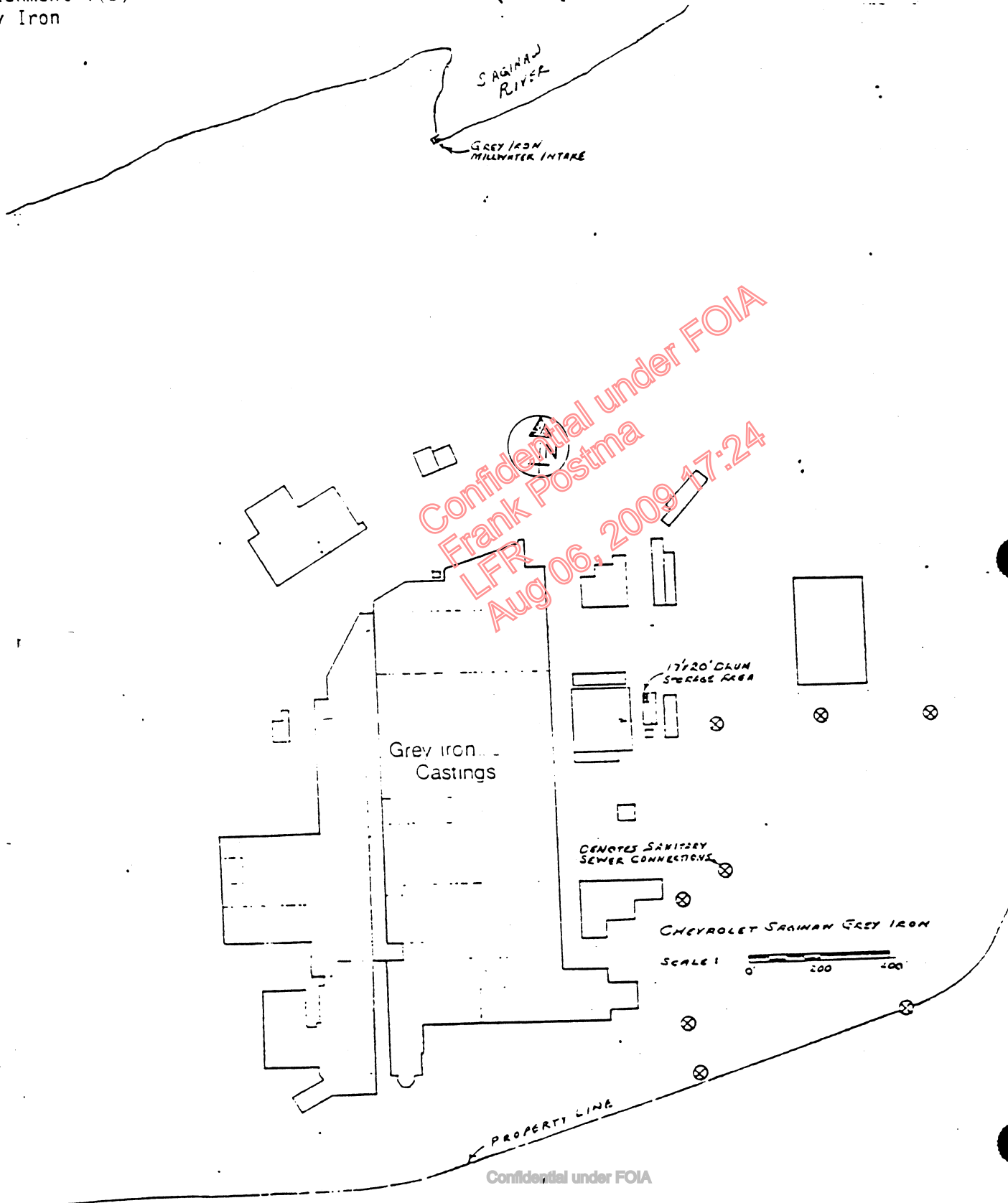
Figure 2. Location of Saginaw Parts Plant regulated unit. From November 17, 1980 Part A permit application.

Continued from page 4

V. FACILITY DRAWING (see page 4)

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Attachment V(B)
Grey Iron



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Figure 3. Location of Grey Iron Castings Plant regulated unit. From November 17, 1980 Part A permit application.

Attachment 7(C)
Nodular Iron

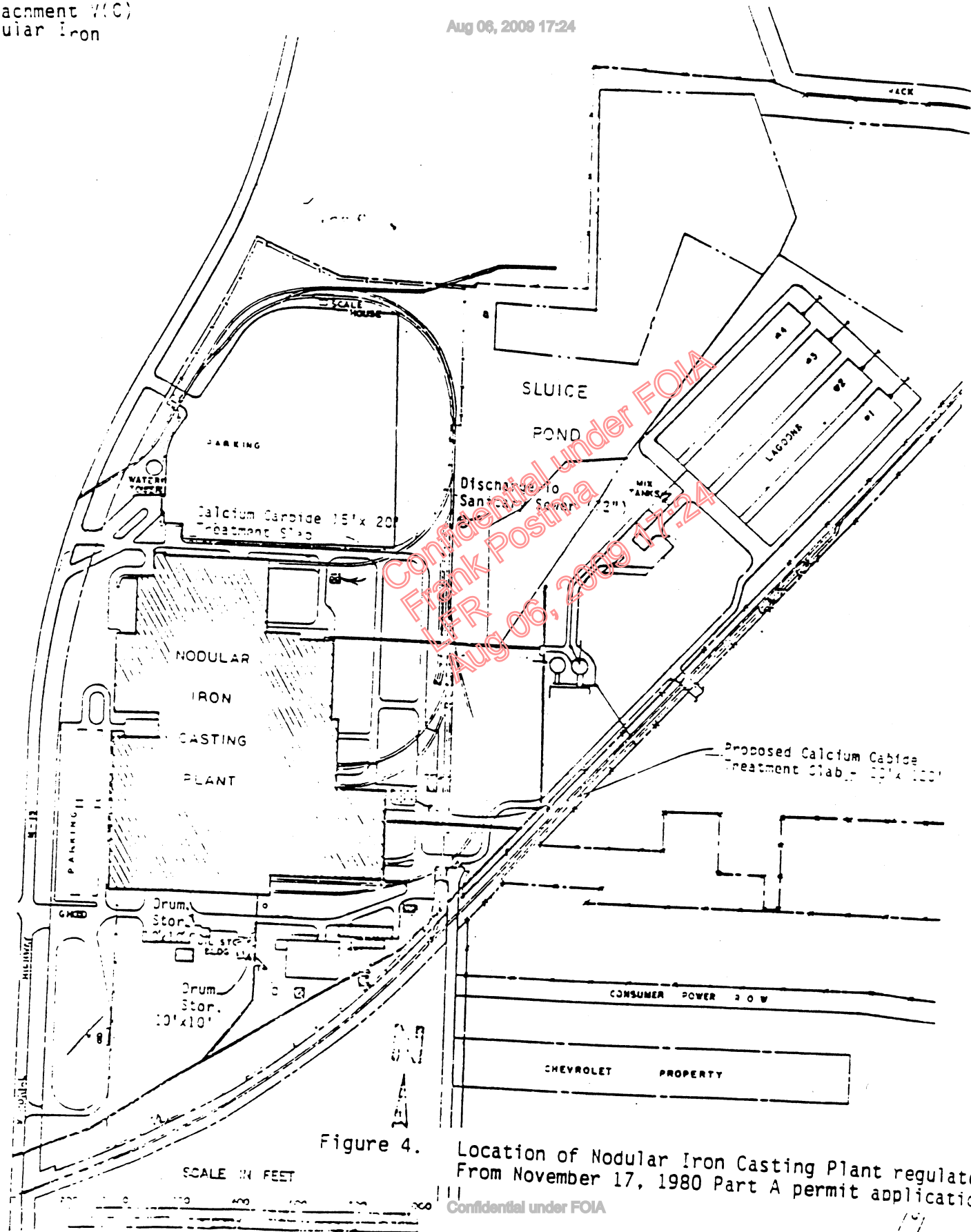


Figure 4.

Location of Nodular Iron Casting Plant regulated From November 17, 1980 Part A permit application

City of Saginaw Property

MW #6 (approx. 10' deep) MW #7 (approx. 40' deep)

MW #4
(approx.
61' deep)

MW #5
(approx.
61' deep)

MW-EE
(approx.
40' dee

RESPONDENT'S ON-SITE LANDFILL

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Kohler Drain

W Island Road

MW-NO 3
(approx. 40' deep)

MW NN
(approx. 40' deep)

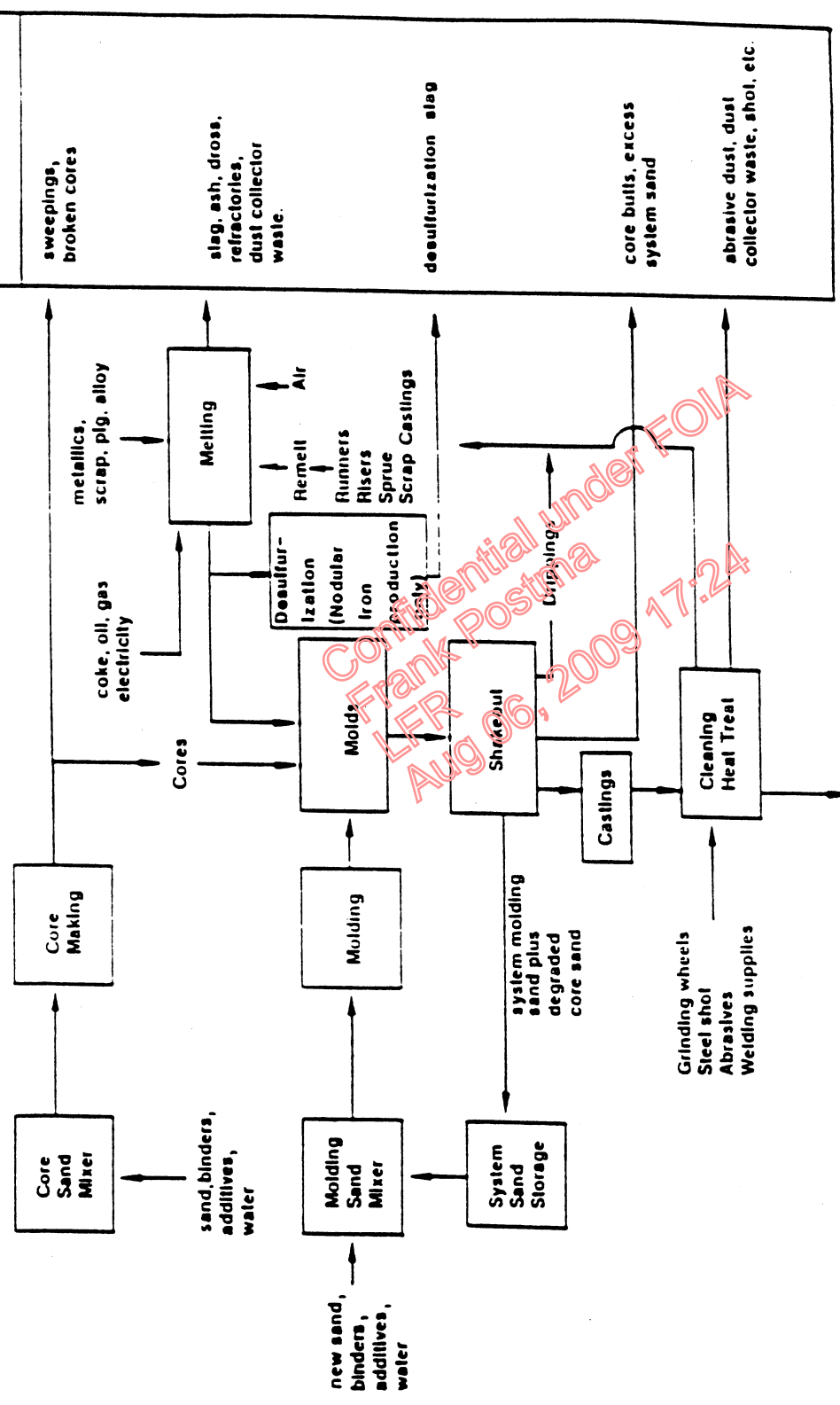
MW-MM
(approx
40' dee:

Hack Road

C&O Rd

Figure 5. Respondent's on-site landfill and monitoring well locations. Traced from a barely legible reduced photocopy of an engineering plan sheet showing the on-site landfill and leachate system trench detail, revised 7/16/85 (year? - barely legible). Author unknown. No scale.

TYPICAL SCHEMATIC MATERIALS AND PROCESS FLOW DIAGRAM



12/6/83 PROJ. NO.: 1137 - 2000



FROM: AFS PUBLICATION "FOUNDRY LANDFILL", 1978.

Figure 6. Copied from "Waste Characterization Study for Foundry Process Solid Wastes, General Motors Corporation Central Foundry Division, Central Foundry, Detroit, Michigan"

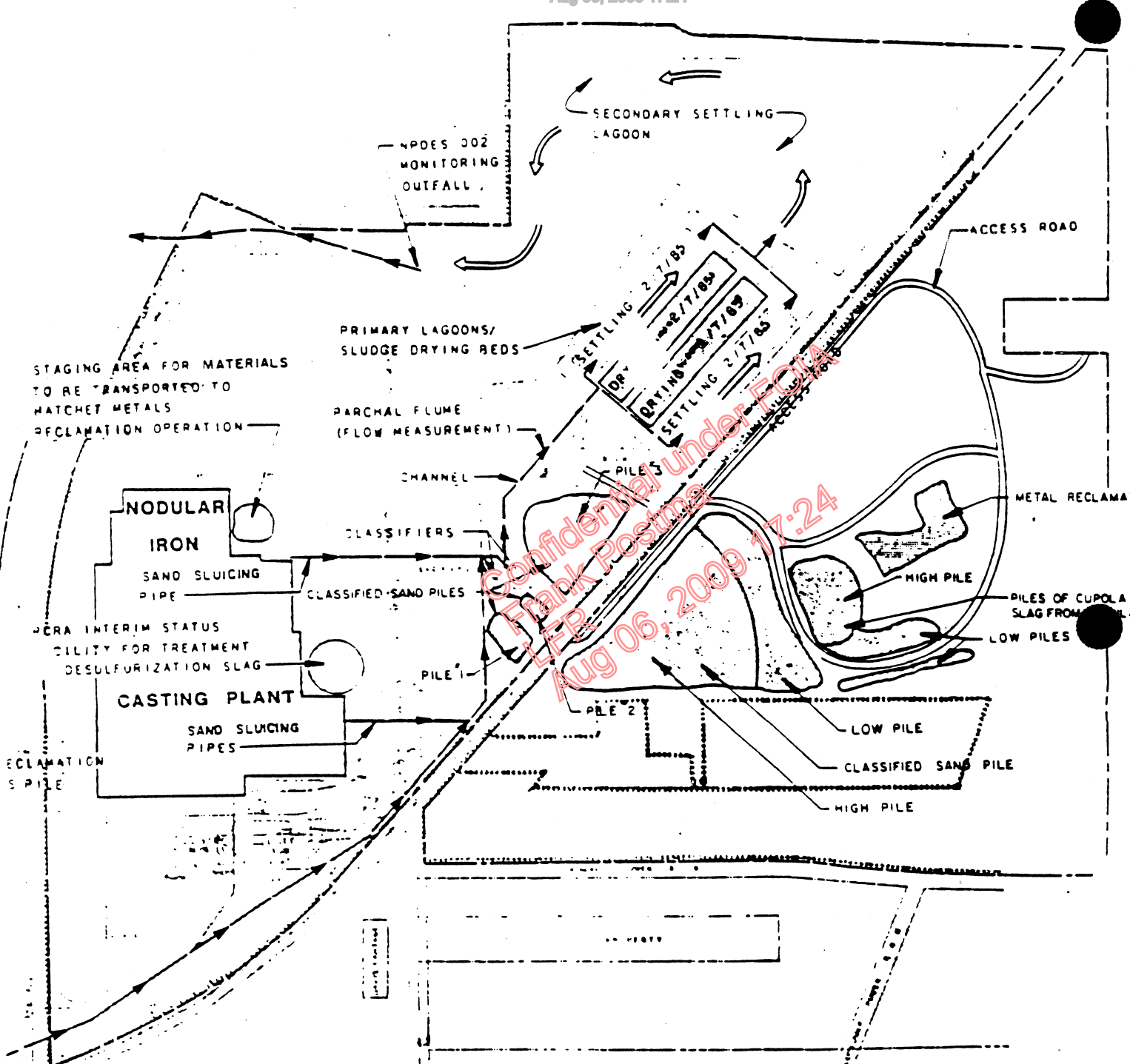
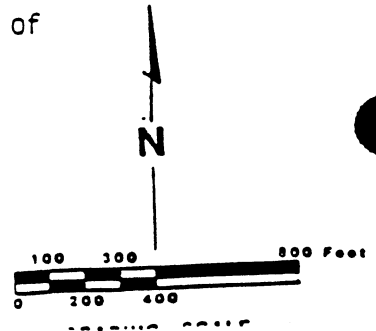


Figure 7a. Location of Nodular Iron Casting Plant waste piles, relative location of on-site landfill, and location of NPDES 002 monitoring outfall. Reduced (64%), excerpted photocopy of "Facility Layout Plan with Stockpile Locations" (Appendix B) from "Waste Characterization Study of Foundry Process Solid Wastes. General Motors Corporation, Central Foundry Division, Nodular Iron Casting Plant, Saginaw Michigan, January 1986," Residuals Management Technology, Inc. Original scale was approx. 1" = 350'.



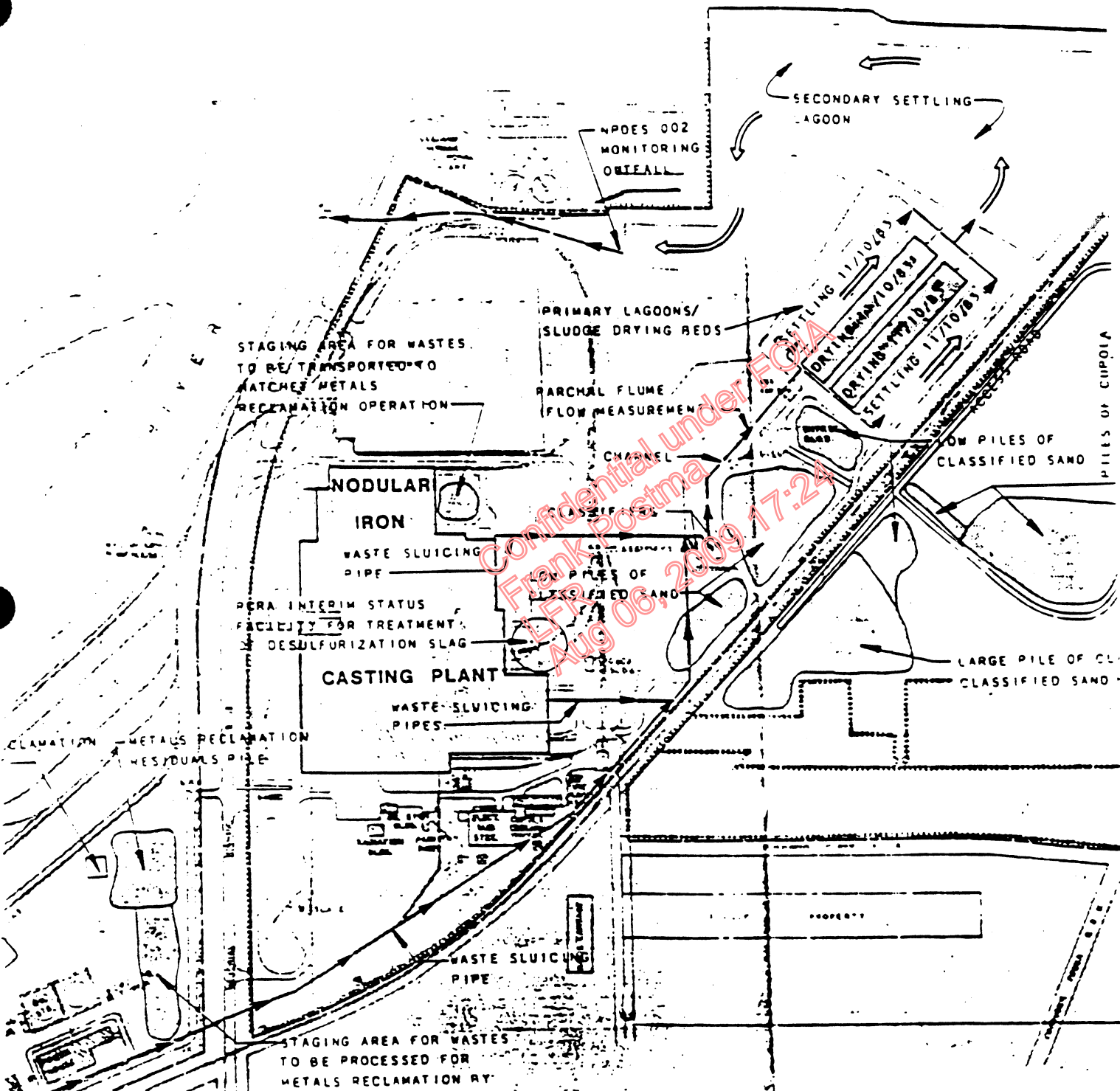
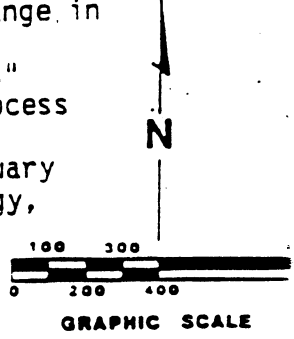


Figure 7b. Location of Nodular Iron Casting Plant waste piles; note change in location over time. Reduced (64%), excerpted photocopy of "Facility Layout Plan with Waste Accumulation Area Locations" (Plate 1) from "Waste Characterization Study for Foundry Process Solid Wastes, General Motors Corporation, Central Foundry Division, Saginaw Nodular and Gray Iron Casting Plants, January 1984, Revised February 1984," Residuals Management Technology, Inc. Original scale was approx. 1" = 350'.



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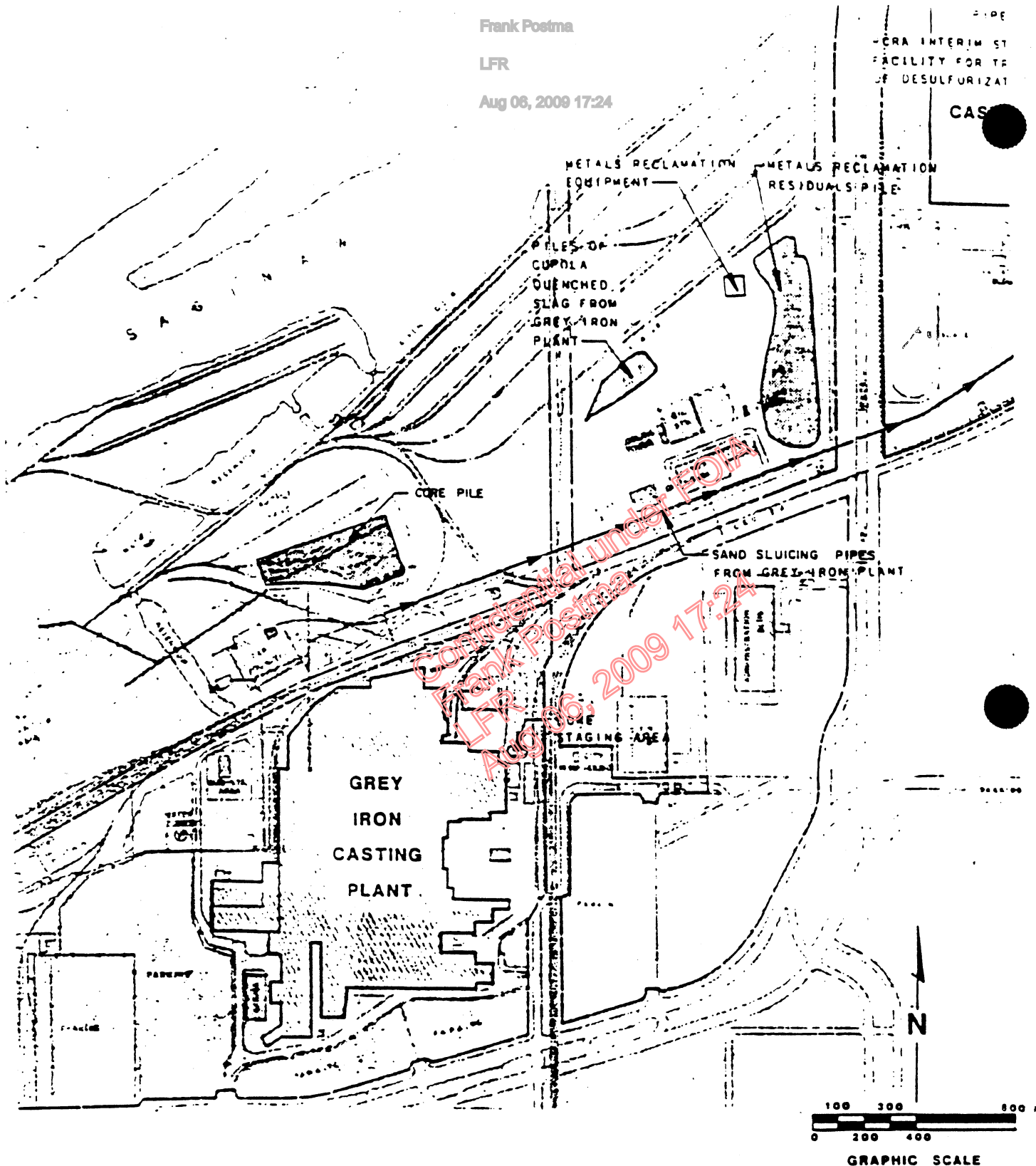


Figure 8a. Location of Grey Iron Casting Plant waste piles. Reduced (64%), excerpted photocopy of "Facility Layout Plan with Stockpile Locations" (Appendix B) from "Waste Characterization Study of Foundry Process Solid Wastes, General Motors Corporation, Central Foundry Division, Nodular Iron Casting Plant, Saginaw Michigan, January 1986," Residuals Management Technology, Inc. Original scale was approx. 1" = 350'.

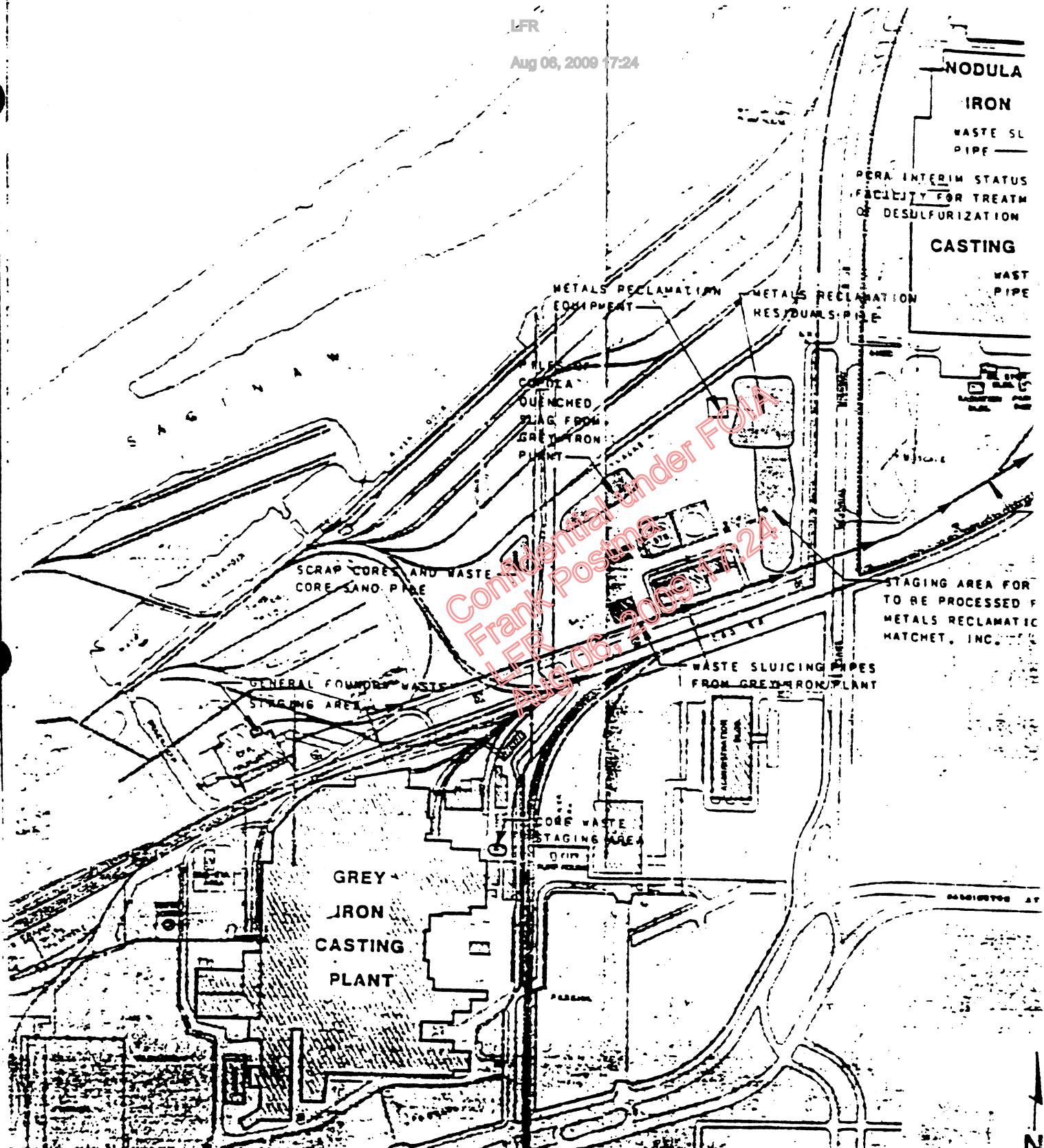
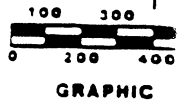
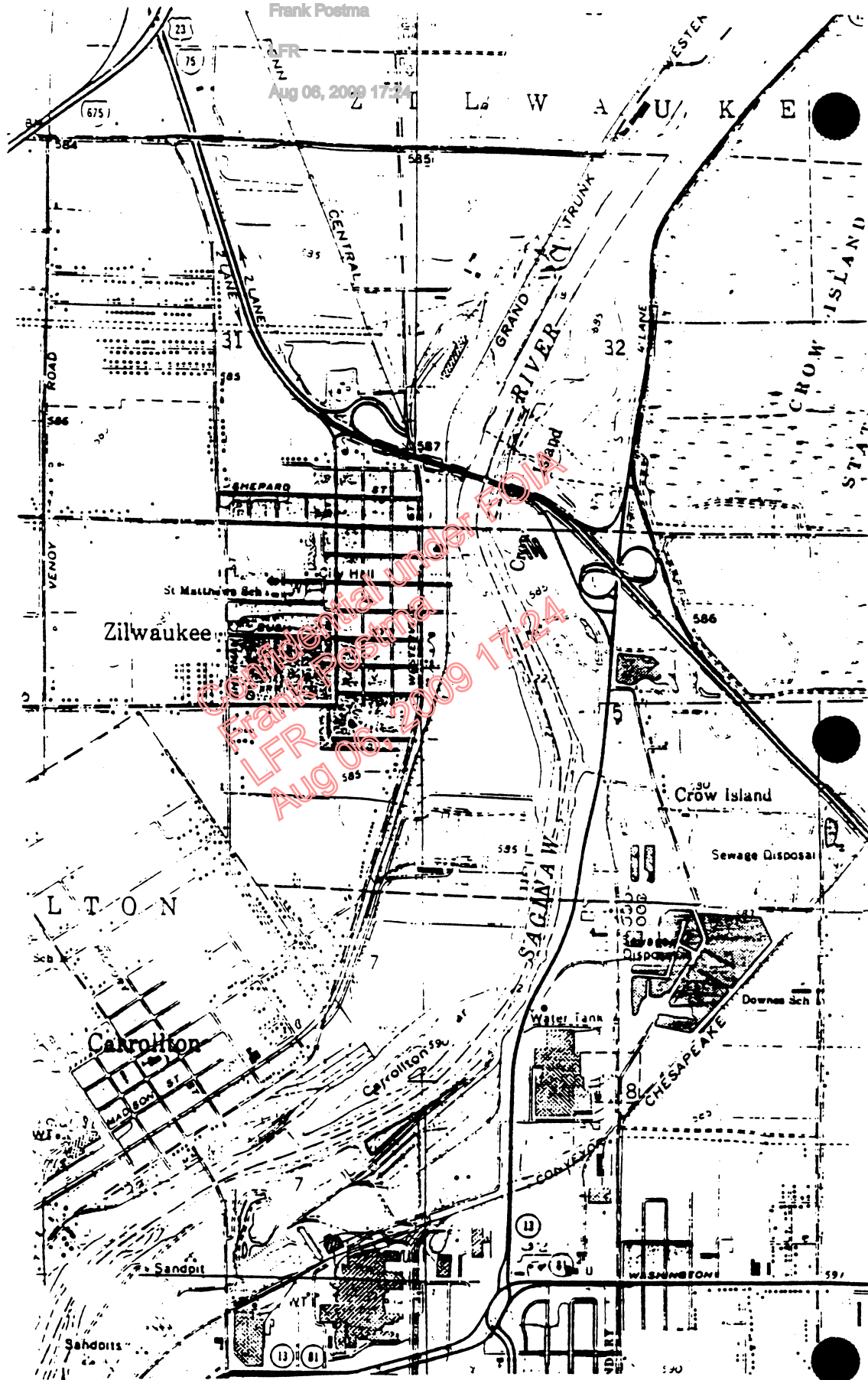


Figure 8b. Location of Grey Iron Casting Plant waste piles; note change in location over time. Reduced (64%), excerpted photocopy of "Facility Layout Plan with Waste Accumulation Area Locations" (Plate 1) from "Waste Characterization Study for Foundry Process Solid Wastes. General Motors Corporation, Central Foundry Division, Saginaw Nodular and Grey Iron Casting Plants, January 1984, Revised February 1984." Residuals Management Technology, Inc. Original scale





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Figure 9a. Location of alleged land disposal of liquid wastes from drums in the late sixties (on Saginaw 7.5 minute topographic quadrangle).



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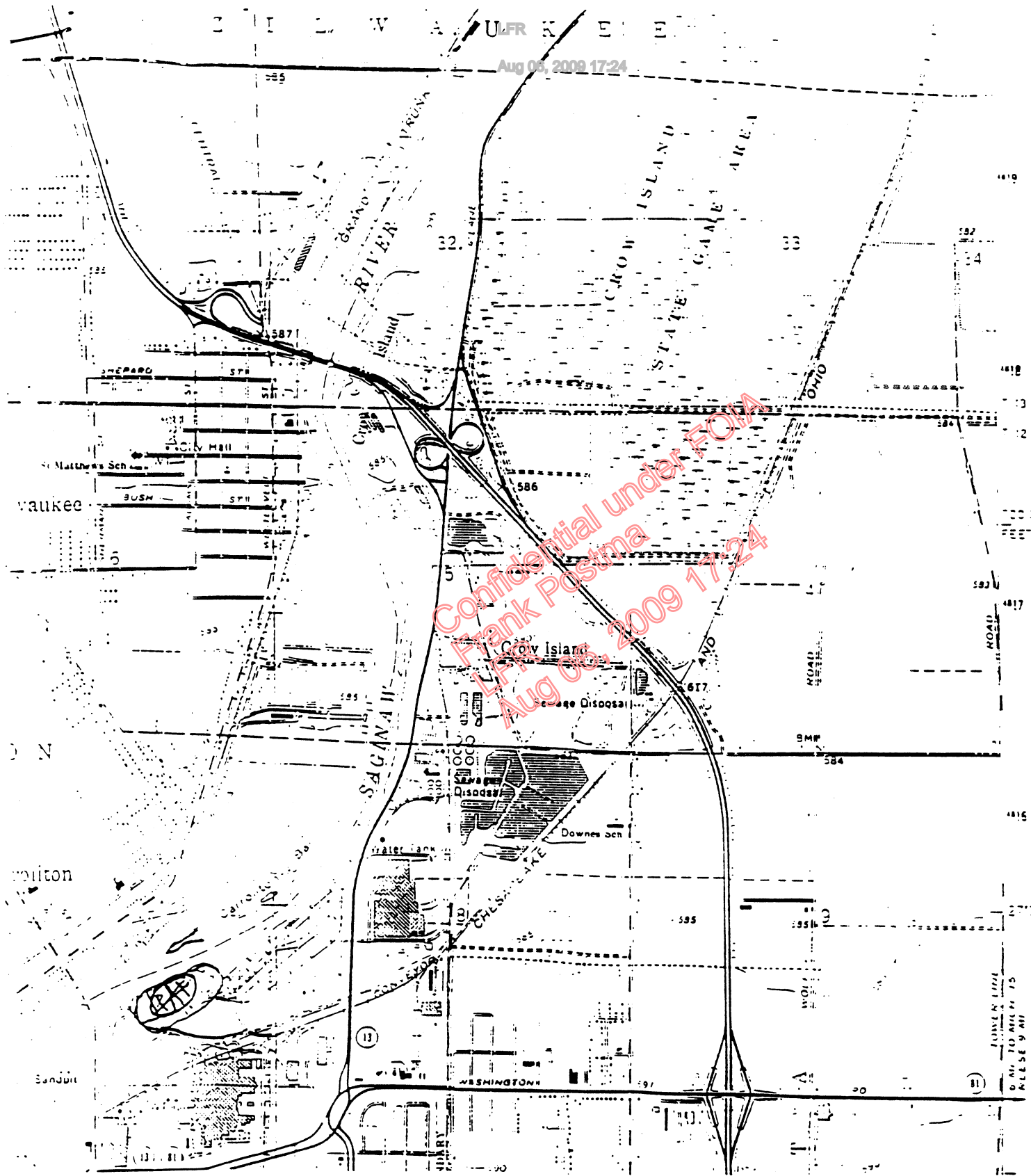


Figure 9b. Location of alleged land disposal of liquid wastes from drums in July or August of 1968 (on Saginaw 7.5 minute topographic quadrangle).

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TABLE-41
SUMMARY OF ASTM WATER LEACH TEST RESULTS
MODULAR IRON PLANT

(all results - mg/l, except ppt)

Parameter	Standard (1)	Modular and Grey Iron Classified Sand Pile Classifiers No. 1	Modular and Grey Iron Classified Sand Pile No. 2	Modular and Grey Iron Classified Sand Pile No. 3	Modular and Grey Iron Classified Sand Pile Surface Sample	Modular and Grey Iron Lagoon Sludge No. 3	Modular Iron Quenched Slag	Modular Iron Reclamation Piles	Modular Iron Calcium Carbide Slag #7548	Modular Iron Calcium Carbide Slag #7549
Arsenic	0.05	< 0.001	< 0.001	< 0.001	< 0.001	0.018	< 0.001	0.014	0.53	0.029
Barium	1.0	< 0.2	< 0.2	< 0.2	< 0.02	0.8	< 0.2	< 0.02	< 0.2	< 0.2
Cadmium	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Chromium	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Copper	1.0	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Total Cyanide	0.2	< 0.02	< 0.02	< 0.02	< 0.025	0.01	< 0.02	< 0.02	< 0.02	< 0.02
Fluoride	2.2	0.68	0.60	0.58	9.8	19.7	0.42	0.74	1.16	0.61
Lead	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Mercury	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Phenols	3.5	0.22	< 0.01	0.16	< 0.01	0.729	0.076	4.9	0.48	4.4
Selenium	0.01	< 0.001	< 0.001	< 0.001	< 0.001	0.006	< 0.001	0.002	0.134	0.102
Silver	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Total Organic Carbon (TOC)	--	4.2	1.8	7.6	2.0	35.2	2.0	34.0	--	--
Chemical Oxygen Demand (COD)	5	< 20	< 20	< 20	< 20	95	< 20	95	--	--
Zinc	6.5-8.5	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	0.03	< 0.01
pH		9.5	8.3	8.3	9.3	9.9	9.5	10.7	12.2	12.0

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Table 1. Photocopy of page 48, from "Waste Characterization Study of Foundry Process Solid Wastes, General Motors Corporation, Central Foundry Division, Nodular Iron Casting Plant, Saginaw Michigan, January 1986," Residuals Management Technology, Inc.

(1) See Table 1V
(129.04 926:0240)

~~TABLE VI~~
SUMMARY OF ASTM WATER LEACH TEST RESULTS
GREY IRON PLANT

October 1985

(all units = mg/l, except pH)

Parameter	Standard ⁽¹⁾	SAMPLE NAME			
		Quenched Slag	Metals Reclamation Residuals Pile	Core Waste Pile	Core Waste Composite
Arsenic	0.05	<0.001	0.044	<0.001	< 0.001
Barium	1.0	<0.2	<0.2	<0.2	< 0.2
Cadmium	0.01	<0.01	<0.01	<0.01	< 0.01
Total Chromium	0.05	<0.05	<0.05	<0.05	< 0.05
Copper	1.0	<0.02	0.02	<0.02	< 0.04
Total Cyanide	0.2	<0.05	0.022	0.028	< 0.05
Fluoride	2.0, 4.0	0.88	5.3	0.44	< 0.1
Lead	0.05	<0.005	<0.005	0.017	0.014
Mercury	0.002	<0.0002	<0.0002	<0.0004	< 0.0002
Phenols	3.5	<0.01	4.1	0.014	8.4
Selenium	0.01	0.002	0.003	<0.001	< 0.001
Silver	0.05	<0.02	<0.02	<0.02	< 0.02
Total Organic Carbon (TOC)	—	<1.0	36.5	21.9	183
Chemical Oxygen Demand (COD)	—	20	99	56	538
Zinc	5	<0.01	<0.01	0.06	0.02
pH	6.5-8.5	9.9	10.6	7.1	6.3

(1) See Table IV

Table 2. Photocopy of page 38, from "Waste Characterization Study for Foundry Process Solid Wastes, General Motors Corporation, Central Foundry Division, Grey Iron Casting Plant, Saginaw, Michigan, June, 1986." Residuals Management Technology, Inc.

~~TABLE VII~~
TOTAL PCB ANALYSIS TEST RESULTS ON WASTES
GREY IRON PLANT

WASTE	PCB (dry weight, ppm as Aroclor #1242)
1. Metals Reclamation Residuals Pile	0.1
2. Grey Iron Core Waste Composite (Isocure, Oil, Shell & Hot Box)	< 0.1
3. Core Waste Pile	0.1
4. Quenched Slag	< 0.1

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Table 3. Photocopy of page 40. from "Waste Characterization Study for Foundry Process Solid Wastes, General Motors Corporation, Central Foundry Division, Grey Iron Casting Plant, Saginaw, Michigan, June, 1986," Residuals Management Technology, Inc.

ATTACHMENT I

REFERENCES FOR CORRECTIVE ACTION ORDER
GENERAL MOTORS CORPORATION
SAGINAW, MICHIGAN
U.S. EPA ID No. MID 041 793 340
U.S. EPA DOCKET NO.: V-W-003-95

The following list comprises additional guidance documents and other information which may be useful in implementing a RCRA §3008(h) Order. This list does not include every guidance document pertaining to work performed under a §3008(h) Order and may not include guidance documents listed in the Administrative Record Index for the Order. Documents are organized according to the relevant section of the Order. Contacts for additional information are included at the end of this list.

Section VII. Work to be Performed

- "Handbook: Stabilization Technologies for RCRA Corrective Action," EPA/625/6-91/026, August 1991.
- "RCRA Ground-Water Monitoring: Draft Technical Guidance," EPA/530-R-93-001, November 1992.
- "Interim Final RCRA Facility Investigation (RFI) Guidance," Volumes I - IV, OSWER Directive 9502.00-6D, EPA/530/SW-89-031, May 1989.
- "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD)," OSWER Directive 9950.1, September 1986.
- "Handbook: Ground Water," Volumes I and II, EPA/625/6-90/016 (a&b), September 1990 and July 1991.
- Ground-Water Modeling: An Overview and Status Report," EPA/600/2-89/028, December 1988.
- "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities," Addendum to Interim Final Guidance, EPA/530-R-93-003, July 1992; Interim Final EPA/530/SW-89/026, April 1989.
- "Data Quality Objectives for Remedial Response Activities," EPA/540/G-87/003 & 004, OSWER Directive 9335.0-7B, March 1987.
- "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors," OSWER Directive 9285.6-03, March 25, 1991.
- "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)," Interim Final, EPA/540/1-89/002, December 1989.

"Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual," Interim Final, EPA/540/1-89/001, March 1989.

"Final Guidance for Data Useability in Risk Assessment," (Parts A & B), OSWER Directive 9285.7-09A, April 1992.

"Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document," EPA 600/3-89/013, March 1989.

"A Compendium of Superfund Field Operations Methods," Two Volumes, EPA/540/P-87/001 a&b, OSWER Directive 9355.0-14, August 1987.

"Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities," EPA 530/SW-86/031, OSWER Directive 9472.003, October 1986.

"Corrective Measures for Releases to Ground Water from SWMUs," Draft Final, EPA/530-SW-88-020, March 1985.

"Technical Guidance for Corrective Measures-- Determining Appropriate Technology and Response for Air Releases," Draft Final EPA/530-SW-88-021, March 1985.

"Air/Superfund National Technical Guidance Study Series," Volumes I-IV, EPA 450/1-89-001, 002, 003, 004 (1989 and 1990).

"Corrective Measures for Releases to Soil from SWMUs," Draft F EPA/530-SW-88-022, March 1985.

"Technical Guidance for Corrective Measures-- Subsurface Gas," EPA/530-SW-88-023, March 1985.

"Guide for Conducting Treatability Studies under CERCLA," Interim Final, EPA/540/2-89/058.

"Selected Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation," EPA/540/8-91/092, 1991.

"Synopsis of Federal Demonstrations of Innovative Site Remediation Technologies," EPA/540/8-91/009, May 1991.

"Bibliography of Federal Reports and Publications Describing Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation," EPA/540/8-91/007, May 1991.

Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments," EPA/530/SW-89/047, July 1989.

"Handbook on In-Situ Treatment of Hazardous Waste-Contaminated Soils," EPA/540/2-90/002, January 1990.

"Stabilization/Solidification for CERCLA and RCRA Wastes," EPA/625/6-89/022, May 1989.

"Health and Safety Requirements of Employees Employed in Field Activities," EPA Order 1440.2, July 12, 1981.

"Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," Interim Final EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988.

"Basics of Pump-and-Treat Groundwater Remediation Technology," EPA/600/8-90/003, March 1990.

"Guide for Conducting Treatability Studies under CERCLA: Aerobic Biodegradation Remedy Screening", EPA/540/2-91/013B, July 1991.

"Guide for Conducting Treatability Studies under CERCLA: Chemical Dehalogenation", EPA/540/R-92/013B.

"Guide for Conducting Treatability Studies under CERCLA: Soil Vapor Extraction", EPA/540/2-91/019B, September 1991.

"Guide for Conducting Treatability Studies under CERCLA: Soil Washing," EPA/540/2-91/020B, September 1991.

"Technology Screening Guide for Treatment of CERCLA Soils and Sludges," EPA/540/2-88/004, September 1988.

"Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Physical Properties," EPA/530/R-92/022, September 1992.

"Statistical Training Course for Ground-Water Monitoring Data Analysis," EPA/530/R-93/003, 1992.

"Literature Survey of Innovative Technologies for Hazardous Waste Site Remediation: 1987 - 1991," EPA/542/B-92/004, July 1992.

"Characterizing Heterogeneous Wastes: Methods and Recommendations," EPA/600/R-92/033, Feb. 1992.

"Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells," EPA/600/4-89/034, April 1989.

"Framework for Ecological Risk Assessment," EPA 630/R-92/001, February 1992.

"RCRA Corrective Action Plan: Final," EPA 520-4-94-004, May 1994.

"RCRA Public Involvement Manual," EPA/530-R-93-006, September 1993.

Section VIII. Quality Assurance

"Interim Guidelines and Specifications for Preparing Quality Assurance Project

Plans," QAMS-005/80, December 29, 1980.

GENERAL INFORMATION:

"Catalog of Office of Waste Programs Enforcement Publications," EPA/540/8-90/016, November 1990.

"A Catalogue of Hazardous and Solid Waste Publications," EPA 530-SW-91-013, May 1991.

"OSWER Directives - System Catalog," OSWER Directive 9013.15-3D, March 1992. (Provides a list of OSWER Directives published through March 1991.)

"Technical Support Services for Superfund Site Remediation and RCRA Corrective Action" (third edition), EPA/540/8-91/091, March 1992.

"Accessing Federal Data Bases for Contaminated Site Clean-Up Technologies," EPA/540/8-91/008, May 1991.

USEFUL TELEPHONE NUMBERS:

RCRA/CERCLA/UST Hotline (800) 424-9346

EPA's Office of Research and Development publishes occasional ground water and engineering issue papers. For information contact:

ORD Publications Office, Center for Environmental Research
Information (CERI), (513) 569-7562

National Technical Information Services (NTIS) (708) 487-4650
(800) 553-6847

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ATTACHMENT II
SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION
AT
GENERAL MOTORS CORPORATION
SAGINAW, MICHIGAN
U.S. EPA ID NO.: MID 041 793 340
U.S. EPA DOCKET NUMBER: V-W-003-95

PURPOSE

The purpose of this RCRA Facility Investigation (RFI) is, consistent with Section IV of this Order, to determine the nature and extent of the release of hazardous waste or hazardous constituents from regulated units, solid waste management units, and other source areas at the Facility, and to gather necessary data to support the Corrective Measures Study. Respondent shall perform the RFI at the Facility in compliance with all of the provisions of the RFI Scope of Work, unless Respondent demonstrates to U.S. EPA that specific facts, circumstances, or conditions at the Facility make one or more specified provisions of a Scope of Work inapplicable to the Facility. Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation at the Facility.

SCOPE

The RCRA Facility Investigation consists of six tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures
- D. Screening Ecological Risk Assessment

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Quality Assurance Project Plan (QAPjP)
- C. Data Management Plan
- D. Health and Safety Plan
- E. Public Involvement Plan

Unless otherwise expressly provided herein, terms used in this Attachment to the Order and in its Appendices which are defined in the Order, in RCRA, or in regulations promulgated under RCRA shall have the definitions given to them in the Order, in RCRA, or in such regulations.

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Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptors

Task V: Investigation Analysis

- A. Data Analysis
- B. Protection Standards
- C. Analysis of Risk

Task VI: Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

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TASK 1: DESCRIPTION OF CURRENT CONDITIONS

Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the Facility and releases of hazardous constituents as set forth below. The data gathered during any previous investigations and other relevant data shall be included.

A. Facility Background

Respondent's report shall summarize the Facility's regional location, pertinent boundary features, general physiography, hydrogeology, and historical use for the treatment, storage, or disposal of solid waste, hazardous waste, and hazardous constituents. Respondent's report shall include:

1. Maps depicting the following:
 - a. General geographic location;
 - b. Property lines with owners of all adjacent property clearly indicated;
 - c. Topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas;
 - d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
 - e. All solid or hazardous waste treatment, storage, or disposal areas (SWMUs and HWMUs) constituting an "active portion" of the Facility (after November 19, 1980);
 - f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they constituted an "active portion" of the Facility on November 19, 1980;
 - g. All known past and present product and waste underground tanks and piping (including, for example, storm sewers, industrial sewers, sanitary sewers, foundation drains, and floor drains);
 - h. Surrounding land uses (e.g., residential, commercial, agricultural, recreational);
 - i. The location of all past and present production, recovery and groundwater monitoring wells. These wells shall be clearly labeled, and ground and top of casing elevations and construction details included. These elevations (using mean sea level as a datum) and details may be included as an

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attachment which summarizes well depth, aquifer(s) screened, screen length, screen interval, well diameter, well material and open hole or sand/gravel pack interval;

- j. Terrestrial Habitat Cover - Types (i.e. vegetation communities); and
- k. Wind rose and meteorology.

All maps shall be consistent with the requirements set forth in 40 CFR 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed pursuant to the Order. (See especially 40 CFR 270.14(b)(11)(ii)(B), 40 CFR 270.14(b)(19), 40 CFR 270.14(c)(3)-(4), and 40 CFR 270.14(d)(1).)

- 2. A history and description of the Facility's ownership and operation, solid waste, hazardous waste, and hazardous constituent generation, treatment, storage, and disposal activities at the Facility, including a historical account of the filling of wetlands with foundry sand (wetlands on a circa 1919 map in the Administrative Record, listed in the index as "various maps").
- 3. Exact dates or approximate periods of past product and waste spills or deposits, identification of the materials (e.g., hazardous constituents) spilled, the amount spilled, the amount recovered, the location where spilled, media impacted, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response. Historical aerial photographs depicting the Facility may be available from the Michigan Department of Transportation (contact Mr. Larry Christianson at (517) 373-0077, Design Division, Photogrammetry Department, 425 W. Ottawa, Lansing, Michigan 48933), the Michigan State University Center for Remote Sensing (contact Ms. Sonya Little at (517) 432-2450, MSU Center for Remote Sensing, 1405 S. Harrison Road, East Lansing, Michigan 48623), and the Michigan Department of Natural Resources (contact Mr. Sherman Hollander at (517) 373-9123, (517) 335-4381 fax, Land and Water Management Division, 530 W. Allegan, Lansing, MI 489).
- 4. A summary of past and present environmental permits requested and/or received; any environmental enforcement actions and subsequent resolution (if any); and a list of environmental documents and studies prepared for the Facility.
- 5. A description of major habitat types (e.g., grasslands, forests, lakes, streams, wetlands) located at, adjacent to, or affected by the Facility. In delineating wetlands, the U.S. Fish and Wildlife Service's National Wetland Inventory maps shall be consulted. In

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addition, the Michigan Department of Natural Resources (MDNR) should be consulted, and wetlands should be delineated using the MDNR Wetland Determination Manual.

6. A description of plants and animals at and adjacent to the Facility, which should include the following: qualitative observations of resident plants and animals (birds, mammals, fish, stream benthos, etc.), and classification of vegetation community types. Threatened and endangered species possibly on or near the site should be identified as early as possible by writing to the United States Fish and Wildlife Service (U.S. F&WS) endangered species coordinator, Mr. Mike DeCapita, U.S. F&WS, East Lansing Field Office, 1405 S. Harrison Road, Room 302, East Lansing, Michigan 48823 and to the Michigan Natural Heritage Database Contact, Michigan Department of Natural Resources, Michigan Natural Features Inventory, Stevens T. Mason Building, 5th Floor, P.O. Box 30028, Lansing, Michigan 48909. You may contact Mr. DeCapita by telephone (517) 337-6650 or fax (517) 337-6899 and the Michigan Natural Heritage Database Contact by telephone at (517) 373-1522 or fax (517) 373-6705.

B. Preliminary Assessment of Nature and Extent of Contamination

Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of releases of hazardous constituents at and from the Facility.

1. Respondent's report shall summarize all possible source areas for releases of hazardous constituents. This, at a minimum, should include all HWMUs, SWMUs, spillage areas (i.e., AOC), and other suspected source areas of contamination identified in the Order. For each area, Respondent shall identify the following:
 - a. Location of HWMU, SWMU, or area of concern (which shall be depicted on a Facility map);
 - b. Quantities of solid and hazardous wastes present (both managed and spilled or released);
 - c. Hazardous waste or constituents (both causing or potentially causing contamination), to the extent known; and
 - d. Identification of areas where additional information is necessary.
2. Respondent shall prepare an assessment and description of the existing degree and extent of contamination for each SWMU, HWMU, or AOC (at a minimum, including those identified in the Order). This should include:

- a. Available monitoring data and qualitative information on locations and concentrations of hazardous constituents at the Facility as well as a map showing the location of all existing sampling points and potential source areas;
- b. All potential migration pathways including information on geology, pedology, physiography, hydrogeology, physiography, hydrology, water quality, meteorology, air quality, and migration through food chains; and
- c. Any known or observed effects of releases of hazardous constituents on biota, such as fish kills, stressed vegetation, or other obvious impacts.
- d. Potential impacts of releases of hazardous constituents on human health and the environment, including the density and capacity of the human population for expansion or decline, groundwater and surface water use, land use, and potential ecological receptors, including any threatened and endangered species. This assessment should be based on existing Facility information, literature-based information on contaminant fate and toxicity, and available criteria and standards (e.g., Ambient Water Quality Criteria).

C. Implementation of Interim Measures

If an interim measure is determined to be necessary, Respondent shall prepare and submit for approval an Interim Measures Workplan in accordance with Section VII.A. of the Order.

D. Screening Ecological Risk Assessment

Respondent shall review and evaluate the information collected for the Description of Current Conditions to determine if the hazardous constituents identified during the Description of Current Conditions work and in the Order might harm those plants, animals, and habitat receptors in the vicinity of the Facility. Respondent shall also evaluate whether the absence of receptors might be due to such hazardous constituents.

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the Facility investigation (RFI Task IV), Respondent shall submit to U.S. EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination from the Facility. This report shall also identify any field data that needs to be collected during the Facility investigation to facilitate the evaluation and selection of the final corrective measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, impact on biological receptors, etc.).

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TASK III: RFI WORKPLAN REQUIREMENTS

Respondent shall prepare a RCRA Facility Investigation (RFI) Workplan. The RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan includes the following:

A. Project Management Plan

Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach for completion of Tasks IV and V, schedules, budget, and personnel. The Project Management Plan also will include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall document the overall management approach to the RCRA Facility Investigation.

B. Quality Assurance Project Plan (QAPjP)

Respondent shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analyses performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPjP shall be prepared in accordance with Attachment IV. A pre-QAPjP meeting shall be held prior to preparation of the QAPjP. Participants should include, but are not limited to the Respondent, their QAPjP preparer, laboratory representatives, U.S. EPA Project Coordinator, U.S. EPA Quality Assurance and Laboratory representatives. (A performance audit may be conducted by U.S. EPA on laboratories selected by Respondent. This audit must be completed and laboratories approved for use on the project prior to the start of field work for the RFI.)

C. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region V groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0. The U.S. EPA Project Coordinator will provide instructions for obtaining GRITS.

1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location (e.g., latitude and longitude) and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis (e.g., mean, median, mode, percentile, range, variance, coefficient of variation);
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., x-y plots, stem and leaf plots, box and whisker plots, bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- a. Sampling location and sampling grid;
- b. Boundaries of sampling area, and areas where more data are required;
- c. Levels of contamination at each sampling location;
- d. Geographical extent of contamination:

- e. Concentrations, averages, and maxima of selected analytes;
- f. Changes in concentration in relation to distance from the source, time, depth or other parameters;
- g. Features affecting intramedia transport; and
- h. Potential receptors.

D. Health and Safety Plan

Respondent shall submit a Health and Safety Plan for all field activity. The Health and Safety Plan shall be developed as a stand-alone document.

- 1. Major elements of the Health and Safety Plan shall include:
 - a. Facility description, including availability of resources such as roads, water supplies, electricity and telephone services;
 - b. Description of the known hazards and evaluate the risks associated with each activity conducted;
 - c. A list of key personnel and alternates responsible for site safety, response operations, and for protection of human health;
 - d. Description of protective clothing or other protective items;
 - e. Delineation of work area;
 - f. Procedures to control site access;
 - g. Description of decontamination procedures for personnel and equipment;
 - h. Site emergency procedures;
 - i. Emergency medical care needed for injuries and toxicological problems;
 - j. Description of requirements for an environmental surveillance program;
 - k. Routine and special training required for response personnel;

1. Procedures for protecting workers from weather-related problems; and
 - m. Facility emergency procedures.
2. The Facility Health and Safety Plan shall be consistent with:
- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
 - b. U.S. EPA Order 1440.1 - Respiratory Protection;
 - c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
 - d. Facility Contingency Plan;
 - e. U.S. EPA Standard Operating Safety Guide (1984);
 - f. OSHA regulations, particularly those in 29 CFR 1910 and 1926;
 - g. State and local regulations; and
 - h. Other applicable U.S. EPA guidance as provided.

E. Public Involvement Plan

The Respondent shall prepare a plan for the dissemination of information to the public regarding investigation activities and results. The plan shall address the preparation and distribution of fact sheets following U.S. EPA review, participation in public meetings where people can talk to U.S. EPA officials and knowledgeable representatives of Respondent on a one-to-one basis, the conduct of scheduled Facility tours (with adequate notice so that U.S. EPA may participate), provision of information in a foreign language to a predominantly non-English speaking (e.g., migrant worker) community, and maintenance of an easily accessible repository (such as a town hall or public library) of information on the corrective action work being performed at the Facility, including the Order, approved workplans, and reports. Respondent's plan shall identify levels of public interest triggering each information dissemination activity.

TASK IV: FACILITY INVESTIGATION

Respondent shall, to the degree deemed necessary by the U.S. EPA to protect human health and the environment, conduct those investigations necessary to: characterize the Facility (Environmental Setting); define the source of contamination (i.e., source of releases of hazardous constituents) (Source Characterization); define the degree and extent of such contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptor Identification). The investigations should result in data of adequate technical content to support the development and evaluation of the corrective measure alternatives during the Corrective Measures Study.

The Facility investigation activities shall be conducted in accordance with the plans approved by U.S. EPA for Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plans. All sampling locations shall be documented in a log and identified on a detailed Facility map.

A. Environmental Setting

Respondent shall collect information to supplement and verify existing information on the environmental setting at the Facility insofar as it is determined that the information submitted in the Description of Current Conditions Report is insufficient to characterize the environmental setting. Respondent shall characterize the following:

1. Hydrogeology

Respondent shall conduct a program to evaluate hydrogeologic conditions at the Facility. This program shall provide the following information:

- a. A description of the regional and Facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the Facility, including:
 - i) Regional and Facility specific stratigraphy including: description of strata including strike and dip; and identification of stratigraphic contacts;
 - ii) Structural geology including: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
 - iii) Depositional history;
 - iv) Identification and characterization of areas and amounts of recharge and discharge;
 - v) Regional and Facility specific groundwater flow patterns; and

- vi) Seasonal variations in the groundwater flow regime;
- b. An analysis of any topographic features that might influence the groundwater flow system (e.g., by stereographic analysis of aerial photographs);
- c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrostratigraphic units which may be part of the migration pathways at the Facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:
 - i) Hydraulic conductivity, intrinsic permeability, and porosity (total and effective);
 - ii) Lithology, grain size, sorting;
 - iii) An interpretation of hydraulic interconnections between saturated zones; and
 - iv) The attenuation capacity and mechanisms of the natural earth and fill materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.);
- d. Based on field studies and cores, structural geology and geological cross-sections showing the extent (depth, thickness, lateral extent) of hydrostratigraphic units which may be part of the migration pathways, identifying:
 - i) Sand and gravel deposits in unconsolidated deposits;
 - ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
 - iii) Zones of high permeability or low permeability that might direct or restrict the flow of contaminants;
 - iv) The uppermost aquifer (geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs); and
 - v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation;
 - vi) All other geologic and anthropologic formations, or parts thereof, yielding a significant amount of ground water;
- e. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of each of

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the investigative areas designated in the approved workplan, a representative description of water level or fluid pressure monitoring, including:

- i) Water-level contour and/or potentiometric maps for aquifers identified in the approved workplan;
 - ii) Hydrogeologic cross-sections showing vertical gradients;
 - iii) The flow system, including the vertical and horizontal components of flow; and
 - iv) Any temporal changes in hydraulic gradients, for example due to seasonal influences or a seiche.
- f. A description of man-made influences that may affect the hydrogeology of the Facility, identifying:
- i) Active and inactive local water-supply and production wells with an approximate schedule of pumping;
 - ii) Man-made hydraulic structures (such as pipelines, French drains, ditches, lined ponds, septic tanks, NPDES outfalls both on-site and from Buena Vista Sewage Treatment Plant, retention areas, the discharge control on the drain connected Gage No. 1 Drain to Saginaw River, etc.); and
 - iii) Any potential hydrogeological effect from the filling of the wetlands (depicted on a circa 1919 map) at the Facility.

2. Soils

Respondent shall conduct a program to characterize the soil and rock units above the water table for each of the investigative areas. (See May 31, 1994 RCRA Corrective Action Plan: information required is based on identification of remedial action.) Such characterization shall include, but not be limited to, the following information:

- a. Soil Taxonomy (SCS/USDA) soil classification;
- b. Surface soil distribution;
- c. Soil profile, including ASTM (D 2487-85) classification of soils;
- d. Transects of soil stratigraphy;
- e. Hydraulic conductivity (saturated and unsaturated);

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- f. Relative permeability;
- g. Bulk density;
- h. Porosity;
- i. Soil sorptive capacity;
- j. Cation exchange capacity (CEC);
- k. Soil organic content;
- l. Soil pH;
- m. Particle size distribution;
- n. Depth of water table;
- o. Moisture content;
- p. Effect of stratification on unsaturated flow;
- q. Infiltration;
- r. Evapotranspiration;
- s. Storage capacity;
- t. Vertical flow rate; and
- u. Mineral content.

3. Surface Water and Sediment

Respondent shall conduct a program to characterize the surface water bodies likely to have been (as well as likely to be in the present and future) affected by releases of hazardous or solid waste (including hazardous constituents) from the Facility. Any investigation of the Saginaw River could be conducted subsequent to the initial phase of the on-site investigation. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the temporal and permanent surface water bodies including:
 - i) For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, volume, and a description of substrate and cover;
 - ii) For impoundments: location, elevation, surface area, depth, volume, frequency of use, and purpose of impoundment;

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- iii) For streams, ditches, wetlands, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event), and a description of substrate and surface cover;
 - iv) Containment measures in place (e.g. levees, concrete lining, etc.);
 - v) Drainage patterns; and
 - vi) Evapotranspiration.
- b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3 , $\text{NO}_3^-/\text{NO}_2^-$, PO_4^{3-}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.; and
- c. Description of sediment characteristics including:
- i) Depositional area;
 - ii) Thickness profile; and
 - iii) Physical and chemical parameters (e.g., grain size, distribution, density, organic carbon content, ion exchange capacity, pH, etc.) and other parameters as directed by U.S. EPA.
- d. Description of biological integrity: based on the descriptions provided in a. through c. above (physical and chemical characteristics of surface water and sediment), synthesize a qualitative evaluation of the biological components of the water column and sediments.

4. Air

Respondent shall provide information characterizing the climate in the vicinity of the Facility. Such information shall include, but not be limited to:

- a. A description of the following parameters:
 - i) Annual and monthly rainfall averages;
 - ii) Monthly temperature averages and extremes;
 - iii) Wind speed and direction.

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- iv) Relative humidity/dew point;
- v) Atmospheric pressure;
- vi) Evaporation data;
- vii) Development of inversions; and
- viii) Climate extremes that have been known to occur in the vicinity of the Facility, including frequency of occurrence; and

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

- i) River valleys;
- ii) Surface water bodies (e.g., rivers, lakes, bays, etc.);
- iii) Wind breaks and forests; and
- iv) Buildings (including bridges).

3. Source Characterization

If an evaluation of the data from wells upgradient and downgradient of investigative areas indicates that a release from an area has occurred, then an investigation of potential source(s) within the area will be performed as follows. Respondent shall proceed to determine potential source areas within the investigative areas based on information presented in the Description of Current Conditions Report (DOCC) and information obtained through sampling, analysis, and evaluation of the investigative areas. U.S. EPA may require that Respondent submit, or Respondent may decide to submit, an initial summary of analytical results and a workplan addendum (or subsequent phase workplan) for U.S. EPA review and approval, prior to implementation of the next phase of source characterization investigation.

Respondent shall collect information, not submitted in the DOCC, to characterize to the degree deemed necessary by U.S. EPA to protect human health and the environment, the hazardous wastes and hazardous constituents present in the investigative area and where the wastes historically and currently have been placed, collected, or removed (e.g., SWMUs, HWMUs, etc.), including: type; quantity; physical form; disposition (containment or nature of deposits); and Facility characteristics affecting release (e.g., Facility security and engineered barriers). This shall include quantification of the following specific characteristics at each source area (to the extent not included in the DOCC):

1. Potential source area characteristics:
 - a. Location of potential source area;
 - b. Type (e.g., surface impoundment, container storage area, waste pile) of potential source area;
 - c. Design features;
 - d. Operating practices (past and present, including history of releases);
 - e. Period of operation;
 - f. Age of unit/disposal area;
 - g. General physical conditions; and
 - h. Method used to close the unit/disposal area.
2. Waste characteristics:
 - a. Type of wastes placed in the potential source areas, including:
 - i) Hazardous classification (e.g., flammable, reactive corrosive, oxidizing or reducing agent);
 - ii) Quantity;
 - iii) Chemical composition; and
 - iv) Waste form (bulk or containerized);
 - b. Physical and chemical characteristics:
 - i) Physical form (solid, liquid, gas);
 - ii) Physical description (e.g., powder, oily sludge);
 - iii) Temperature;
 - iv) pH;
 - v) General chemical class (e.g., acid, base, solvent);
 - vi) Molecular weight;
 - vii) Density;
 - viii) Boiling point;

- ix) Viscosity;
- x) Solubility in water;
- xi) Cohesiveness of the waste;
- xii) Vapor pressure; and
- xiii) Flash point; and

c. Migration and dispersion characteristics:

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates; and
- v) Chemical transformation.

Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

In the initial phase of the investigation, Respondent shall collect and evaluate analytical data on hazardous constituents potentially present in groundwater, soils, on-site surface water, on-site sediment, air, and subsurface gas, as identified in the approved workplan for investigative areas. The Saginaw River may be investigated subsequent to the initial phase of the on-site investigation.

If an evaluation of data pertaining to an investigation area indicates a release of hazardous constituents from the area (that U.S. EPA determines may present a threat to human health or the environment), then an investigation of potential sources within the area and contamination resulting from releases will be performed according to the following sections as applicable. U.S. EPA may require that Respondent submit, or Respondent may decide to submit, an initial summary of analytical results and a workplan addendum (or subsequent phase workplan) to U.S. EPA for review and approval.

The subsequent phase(s) shall be designed to identify and evaluate contamination and potential source areas based on: information presented in the DOCC, information obtained from the performance of the prior phase(s), and information obtained through sampling, analysis, and evaluation of the potential source area(s) within the individual areas. The data obtained from each of the phases for the source areas shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of

sampling, media sampled, concentrations of contaminants found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. Respondent shall address contaminant characterization at the Facility as follows:

1. Groundwater Contamination

Respondent shall conduct a Groundwater Investigation to characterize any plumes of contamination at the Facility. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the Facility;
- b. The horizontal and vertical directions of contamination movement;
- c. The velocities of contaminant movement;
- d. The horizontal and vertical concentration profiles of Appendix IX constituents present in the plume(s);
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement (a time period may be specified by U.S. EPA in the approved workplan).
- g. Respondent shall document the procedures to be used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the potential source areas. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation;
- c. Specific contaminant concentrations;

- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement (a time period may be specified by U.S. EPA in a comment or approval).

Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

Respondent shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from the contaminant releases at the Facility. Any investigation of the Saginaw River could be conducted subsequent to the initial phase of the on-site investigation. The investigation shall include, but not be limited to, the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments;
- b. The horizontal and vertical direction of contaminant movement;
- c. The contaminant velocities;
- d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- e. An extrapolation of future contaminant movement; and
- f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, and specific contaminant concentrations (i.e., ionic strength), hardness, etc.

Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released from the Facility into the atmosphere, that are not subject to an effective permit or a submitted permit application under the Federal or State Clean Air Acts. This investigation shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of releases; and
- c. The chemical and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the groundwater. This investigation shall provide the following information:

- a. A description of the horizontal and vertical extent of subsurface gas migration;
- b. The chemical composition of the gases being emitted;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Respondent shall document the procedures used in making the above determinations.

J. Potential Receptors Identification

For purposes of the risk assessment, Respondent shall collect data describing the human populations and environmental systems that are notably absent, currently at risk of contaminant exposure, or potentially at risk of contaminant exposure from the Facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems also may be needed. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:
 - a. Type of use (e.g., drinking water source, municipal, residential, agricultural, domestic/non-potable, and industrial); and
 - b. Locations of groundwater users, including wells and discharge areas.

2. Local uses and possible future uses of surface water draining from the Facility:
 - a. Domestic and municipal (e.g., potable, lawn/gardening watering);
 - b. Recreational (e.g., swimming, fishing);
 - c. Agricultural;
 - d. Industrial; and
 - e. Environmental (e.g., fish and wildlife propagation).
3. Human use or access to the Facility and adjacent lands, including but not limited to:
 - a. Recreation;
 - b. Hunting;
 - c. Residential;
 - d. Commercial; and
 - e. Relationship between population locations and prevailing wind direction.
4. A demographic profile of the people who use or have access (authorized or unauthorized) to the Facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
5. Ecological characteristics of the Facility.
 - a. A Screening Ecological Risk Assessment (SERA)² will describe the ecology of areas on and adjacent to the Facility, including:
 - i. Habitat and species present and expected to be present;
 - ii. Biota present in surface water bodies on or adjacent to the Facility; and,
 - iii. Any listed State and Federal threatened or endangered species, and candidate species for listing as a State or Federal endangered or threatened species in the

²Screening Ecological Risk Assessments are described in "Ecological Risk Assessment Guidance for RCRA Corrective Action, Region V: Interim Draft" (October 1994) or subsequent guidance.

immediate vicinity (as defined by U.S. EPA in consultation with the U.S. Fish and Wildlife Service) of the Facility.

- b. If, based on the CERCLA, past and present information regarding estimates or measurements of exposure indicate that ecological receptors may be at unacceptable risk from past, present, or potential releases from the Facility, U.S. EPA will require a preliminary ecological risk assessment (PERA)³. Data required for the PERA will include one or more of the following, depending on the contaminants of concern, past and present transport mechanisms, and ecological endpoint(s) selected by the Facility and approved by U.S. EPA.
- i. Chemical sampling in potentially exposed habitats and reference sites;
 - ii. Toxicity testing;
 - iii. Tissue analyses;
 - iv. Biological community assessment;
 - v. Habitat assessment of aquatic (including sediments) and terrestrial habitats on or potentially affected by the Facility;
 - vi. Revised assessment of ecological impacts on receptors - Impacts should include those occurring at individual level (e.g., mortality, growth and reproductive impairments) and those occurring at higher levels of biological organization (i.e., at population, community, and ecosystem levels); and
 - vii. Literature review to ascertain potential adverse ecological effects due to the toxicity of the hazardous constituents.

³Preliminary ecological risk assessments are described in "Ecological Risk Assessment Guidance for RCRA Corrective Action, Region V: Interim Draft" (October 1994) or subsequent guidance.

TASK V: INVESTIGATION ANALYSIS

Respondent shall prepare an analysis and summary of all Facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, that (using the media cleanup standards) may pose a threat to human health or the environment, potential threat to human health or the environment, and to support the Corrective Measures Study.

A. Data Analysis

Respondent shall analyze all Facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the Facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area.

B. Media Cleanup Standards

Respondent shall provide information as required by U.S. EPA to support the U.S. EPA's selection/development of media cleanup standards to address any releases that have or reasonably may have adverse effects on human health and the environment due to migration of hazardous constituents. Media cleanup standards are to contain such terms and provisions as necessary to protect human health and the environment, including the provisions stated below.

1. Groundwater Cleanup Standards

Respondent shall provide information to support the Agency's selection/development of Groundwater Cleanup Standards for the Appendix IX constituents found in the groundwater during the Facility Investigation (Task IV), as necessary.

- a. Information for the development of the Groundwater Cleanup Standards shall include:
- i) Maximum Contaminants Levels (MCLs) for constituents listed in the National Primary Drinking Water Regulations (40 CFR Part 141), if the background level of the constituent is below the given MCL;
 - ii) The background level of that constituent in the groundwater;
 - iii) A U.S. EPA-approved Alternate Concentration Limit (ACL); and
 - iv) Levels based on the risk assessment.

- b. Information to support the Agency's subsequent selection of cleanup standards shall be developed by the Respondent in accordance with applicable Federal rules and U.S. EPA guidance. For any proposed ACLs, Respondent shall include a justification based upon the criteria set forth in 40 CFR 264.94(b).
- c. Following receipt of any proposed cleanup standards, the U.S. EPA shall notify Respondent in writing of approval, disapproval or modifications. The U.S. EPA shall specify in writing the reasons for any disapproval or modification.
- d. Within thirty (30) days of receipt of the U.S. EPA's notification of disapproval of any proposed cleanup standard, the Respondent shall amend and submit revisions to the U.S. EPA.

2. Soil Cleanup Standards

Respondent shall provide information to support the U.S. EPA's selection/development of soil cleanup standards. U.S. EPA may require the following information:

- a. The volume and physical and chemical characteristics of the wastes in the investigative areas or potential source areas;
- b. The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing contaminant migration;
- c. The hydrologic characteristics of the investigative areas or potential source areas and the surrounding area, including the topography of the land around the unit;
- d. The patterns of precipitation in the region;
- e. The existing quality of surface soils, including other sources of contamination and their cumulative impacts on surface soils;
- f. The potential for contaminant migration and impact to the underlying groundwater;
- g. The patterns of land use in the region;
- h. The potential for health risks caused by human exposure to waste constituents; and
- i. The potential for damage to domestic animals, wildlife, food chains, crops, vegetation, and physical structures caused by exposure to waste constituents.

3. Surface Water and Sediment Cleanup Standards

Respondent shall provide information to support the U.S. EPA's selection/development of surface water and sediment cleanup standards. The U.S. EPA may require the following information:

- a. - d. As above in 2.
- e. The quantity, quality, and direction of ground-water flow;
- f. The proximity of the HWMU or SWMU to surface waters;
- g. - i. As above in 2.
- j. The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;
- k. The existing quality of surface waters, including other sources of contamination and their cumulative impacts on surface waters.

4. Air Cleanup Standards

Respondent shall provide information to support the U.S. EPA's selection/development of air cleanup standards for emissions control of corrective measures. U.S. EPA may require the following information:

- a. The volume and physical characteristics of the wastes in the HWMU or SWMU, including its potential for the emission and dispersal of gases, aerosols and particulates;
- b. The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;
- c. The operating characteristics of the HWMU or SWMU;
- d. The atmospheric, meteorological, and topographic characteristics of the HWMU or SWMU and the surrounding area;
- e. The existing quality of the air, including other sources of contamination and their cumulative impact on the air;
- f. The potential for health risks caused by human exposure to waste constituents; and
- g. The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

5. Other Relevant Protection Standards

Respondent shall identify and consider all relevant and applicable standards or criteria for protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, water quality criteria, health advisories, proposed MCLs, sediment contaminant guidelines, etc.).

C. Analysis of Risk

Respondent shall prepare an analysis of risk at the Facility. This analysis may include human health as well as ecological risk. Generally a base line human health risk assessment would be conducted during the RFI stage with further analysis occurring during the CMS stage. Respondent shall conduct a detailed ecological risk assessment (DERA), following the procedures laid out in "Ecological Risk Assessment Guidance for RCRA Corrective Action, Region V Interim Draft" (October 1994) or subsequent guidance. Generally, a DERA includes characterization of exposure, characterization of ecological effects, and characterization of risk.

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TASK VI: REPORTS

A. Preliminary and Workplan

Respondent shall submit the report on Task I as specified in Section VII.B.(1) of the Order. Respondent shall submit an RFI Workplan (Task III) as specified in Section VII.B.(2) of the Order. Respondent shall submit the report on Task II in accordance with the U.S. EPA-approved RFI Workplan schedule.

B. Progress

Following U.S. EPA approval of the RFI Workplan and before U.S. EPA approval of the RFI Report, Respondent shall at a minimum provide U.S. EPA with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representatives of local community public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Draft and Final

By the date specified in the U.S. EPA-approved RFI Workplan, Respondent shall submit a RCRA Facility Investigation Report to present Tasks IV and V. The RCRA Facility Investigation Report shall be submitted to U.S. EPA for review. Respondent shall submit revised RFI Reports as necessary in response to U.S. EPA comments, in accordance with Section IX of the Order.

Copies of all reports, including the Task I report, Task III workplan, and all versions of the RCRA Facility Investigation Reports (Task VI) shall be provided by the Respondent to U.S. EPA in accordance with Sections VII.8 (Work to be Performed), XV (Reporting and Document

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Certification), and Section XIV (Project Coordinator) of the Order.

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Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below.

Facility Submission	Due Date
Description of Current Conditions Report (Task I)	Within 45 days of the Order becoming final (Section VII.B.(1) of the Order)
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	In accordance with the U.S. EPA-approved RFI workplan schedule
RFI Workplan (Task III)	Within 120 days of the Order becoming final (Section VII.B.(2)-(5) of the Order)
RFI Report(s)	In accordance with the approved workplan schedule (Sections VII.B. and IX.A. of the Order)
Progress Reports on Tasks II, IV, & /	On the monthly cate specified in the U.S. EPA-approved RFI Workplan (following the Order becoming final)

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