DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99
Revised 9/20/02

RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Former A.Y. McDonald Manufacturing Company Site
Facility Address: 12th and Pine Streets, Dubuque, Iowa
Facility EPA ID #: IAD0055103882

DETERMINATION RESULT: YE

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-

aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The A. Y. McDonald (McDonald) site is the location of a former grey iron and brass foundry in an industrialized portion of Dubuque, Iowa. Foundry operations were initiated in 1896 and discontinued in 1983. When the foundry was active, the facility covered approximately 16.3 acres of land bounded by 14th Street to the north, Pine Street to the west, 12th Street to the south, and a storm water retention basin to the east. The Mississippi River lies approximately 0.25 miles east of the McDonald site and is separated from the storm water retention basin by a 250-foot wide levee. The City of Dubuque and large areas to the southwest, particularly in areas of higher elevation than the McDonald site, have historically been heavily used for lead mining operations (Ref. 1).

Throughout the facility's operations, a variety of wastes (including foundry wastes, building rubble, and household refuse from the City of Dubuque) were used to fill a topographic low area on the eastern side of the site. Foundry wastes were also deposited in unlined, uncovered piles on the McDonald property. These wastes included German machine dust, grind baghouse dust, wet scrubber sludge, sand system wastes, Pangborn dusts, and core sand. Isolated waste piles were also identified on the western side of the property. Estimated volumes of wastes disposed at the site range from 30 to 8,000 tons (Ref. 7). Extraction Procedure Toxicity testing conducted by the Environmental Protection Agency (EPA) in 1984 characterized some of the foundry waste piles as hazardous due to elevated levels of leachable lead. Soil samples collected beneath the foundry waste piles were determined to be nonhazardous (Ref. 3), but soil beneath areas of more concentrated foundry waste fill were found to contain lead contamination at levels up to 8,200 milligrams per kilogram (mg/kg).

In 1986, structures at the McDonald site were dismantled and removed. The waste disposal area at the McDonald site was subsequently addressed in accordance with a 1987 Consent Order with EPA (Ref. 4). Implemented closure actions included:

- Consolidation of foundry wastes and miscellaneous debris from various locations across the site into a landfill on approximately 5.5 acres in the eastern portion of the site
- Recontouring the disposal area surface for physical stability
- Application of calcium carbonate to the disposal area surface and homogenization of calcium carbonate into the wastes to increase chemical stability and reduce leachable lead concentrations
- Installation of a low permeability (10E-07 centimeter per second) clay cap and vegetative layer over the disposal area
- Reseeding the vegetative layer to minimize erosion and ensure cap integrity
- Installation of security fencing and associated signage around the capped area, except in those locations where access is prevented by the stormwater retention basin, ditches, and the highway easement (Ref. 5).

EPA formally approved the disposal area closure on December 27, 1988 (Ref. 6). No other SWMUs, RUs, or AOCs have been identified on the McDonald site.

Because the hazardous foundry wastes were placed predominantly on the eastern portion of the site, and because wastes from the western side were relocated to the eastern disposal area during closure activities, environmental

activity at the McDonald site is now focused on the closed disposal area and underlying groundwater. Ongoing post-closure activities specifically include annual groundwater monitoring, routine maintenance of the disposal area cap, and periodic inspection of fencing and warning signs around the disposal area (Ref. 8). Post-closure groundwater monitoring activities were completed on a quarterly basis from 1988 through the fourth quarter of 1994. In the spring of 1995, EPA accepted a petition from McDonald for a reduced groundwater monitoring frequency. Since August 1995, post-closure groundwater monitoring has been conducted annually to assess dissolved lead concentrations in the uppermost aquifer beneath the McDonald site (Ref. 8). Well locations are shown on the site diagram provided as Attachment 1 to this EI determination.

In addition, as shown on the site diagram (Attachment 1), the western portion of the former McDonald property is currently being used by several other companies, including Riverside Tire and Steel Mart. U.S. Highway 61 has been constructed over the westernmost third of the closed waste disposal area. McDonald is currently considering development opportunities for the remaining eastern portion of the property. On June 19, 2000, the Dubuque City Council approved a zoning change for this area from Public Open Space to Low Density Industrial (Ref. 8). Improvements currently being evaluated by McDonald and the City of Dubuque include general purpose warehousing, self-storage rental units, office space, and/or truck parking. According to the 2004 Post Closure Monitoring Report (Ref. 8), any improvements in this area will be built on a one to three foot protective base over the existing landfill grade with a low permeable cover. No property improvements have been selected or initiated to date (Ref. 8).

References

1. Draft Hazard Ranking System Ranking. Prepared by Ecology and Environment, Inc. Dated November 26, 1984.
2. Final Site Investigation Report. Prepared by Ecology and Environment, Inc. Dated July 3, 1985.
3. Draft Hydrogeologic Assessment and Closure Plan. Prepared by ATEC Associates, Inc. Dated November 21, 1985.
4. Letter from J. Werholtz, EPA Region 7, to J. Bergren, Iowa Department of Transportation, and R. McDonald, A. Y. McDonald Industries, Inc., re: A. Y. McDonald Superfund Site Consent Order. Dated August 19, 1987.
5. Revised Response Action Report. Prepared by ATEC Associates, Inc. Dated December 14, 1988.
6. Letter from R. Morby, EPA Region 7, to R. McDonald, A. Y. McDonald Manufacturing Company, re: Closure Plan Approval. Dated December 27, 1988.
7. Final RCRA Comprehensive Groundwater Monitoring Evaluation. Prepared by Jacobs Engineering Group. Inc. Dated July 10, 1989.
8. 2005 Annual Post Closure Monitoring Report. Prepared by Forest Road Consulting, Inc. Dated September 18, 2005.

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

_____ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

__X__ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale:

Post-closure groundwater monitoring for the McDonald waste disposal site evaluates water quality and hydrogeologic conditions in two stratigraphic units. The upper hydrogeologic unit consists of unconsolidated gravel, sand, silt, and clay horizontally stratified in layers, lenses, and channels. These sediments are Quaternary in age and are the result of typical river-related deposition, coupled with enhanced sedimentation associated with glacial activity. The upper well system generally extends to depths of 20 to 25 feet below the ground surface (bgs) and includes monitoring wells S-1, S-2A, S-3, S-4, S-5, S-6, and S-7 (shown on Attachment 1). Piezometer P-6 also monitors the upper hydrogeologic unit. A hydraulic gradient of less than 0.01 has been calculated for this unit, with flow generally appearing to move toward the north and northeast (Ref. 3).

The lower hydrogeologic unit consists mainly of fine- to coarse-grained sands and generally extends to depths of 35 to 40 feet bgs. The lower hydrogeologic unit is monitored by wells D-1 through D-8 (shown on Attachment 1). A hydraulic gradient of less than 0.01 has also been calculated for this unit, with flow to the east (Ref. 3). The lower hydrogeologic unit is underlain by bedrock that consists of dense, fractured dolomite of the Platteville Dolomite formation. Boring logs indicate that the upper bedrock surface slopes toward the Mississippi River, such that depth to bedrock ranges from approximately 40 feet bgs on the site's western edge to greater than 50 feet bgs on the eastern edge.

The most recent post-closure groundwater monitoring events at McDonald were conducted in July 2003, September 2004 and August 2005 (Refs. 1, 2 and 3). Lead was the only constituent for which laboratory analysis was requested during these sampling rounds. During the July 2003 sampling event, none of the groundwater samples reported detectable dissolved lead concentrations based on a quantitation limit of 0.0040 milligrams per liter (mg/L). During the September 2004, dissolved lead was detected only in well S-5 at the extreme western corner of the waste disposal area. The reported dissolved lead concentration in this well (0.0043 mg/L) was only slightly above the detection limit and considerably lower than the maximum contaminant level of 0.015 mg/L established for lead under 40 CFR 141.80(c)(1). Finally, none of the groundwater samples in August 2005 reported detectable dissolved lead concentrations based on a quantitation limit of 0.0040 milligrams per liter (mg/L). Consequently, groundwater

---

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

beneath the McDonald disposal site is not currently contaminated at concentrations above applicable screening criteria.

References

1. 2003 Annual Post Closure Monitoring Report. Prepared by Forest Road Consulting, Inc. Dated August 12, 2003.
2. 2004 Annual Post Closure Monitoring Report. Prepared by Forest Road Consulting, Inc. Dated October 18, 2004.
3. 2005 Annual Post Closure Monitoring Report. Prepared by Forest Road Consulting, Inc. Dated September 18, 2005.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale:

This question is not applicable. See the response to Question 2.

---

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale:

This question is not applicable. See the response to Question 2.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale:

This question is not applicable. See the response to Question 2.

---

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[5], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale:

This question is not applicable. See the response to Question 2.

---

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale:

This question is not applicable. See the response to Question 2.

8. Check the appropriate RCRA Info status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Former A. Y. McDonald Manufacturing Company Site**, EPA ID **#IAD0055103882**, located in **Dubuque, Iowa**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by Patricia Murrow Date 8/23/06
Pat Murrow
EPA Project Manager

Supervisor Lynn M Slugantz Date 8-24-06
Lynn Slugantz
RCAP Branch Chief

Locations where References may be found:

EPA Region 7 RCRA Records Center
901 N. 5th Street
Kansas City, KS 66101

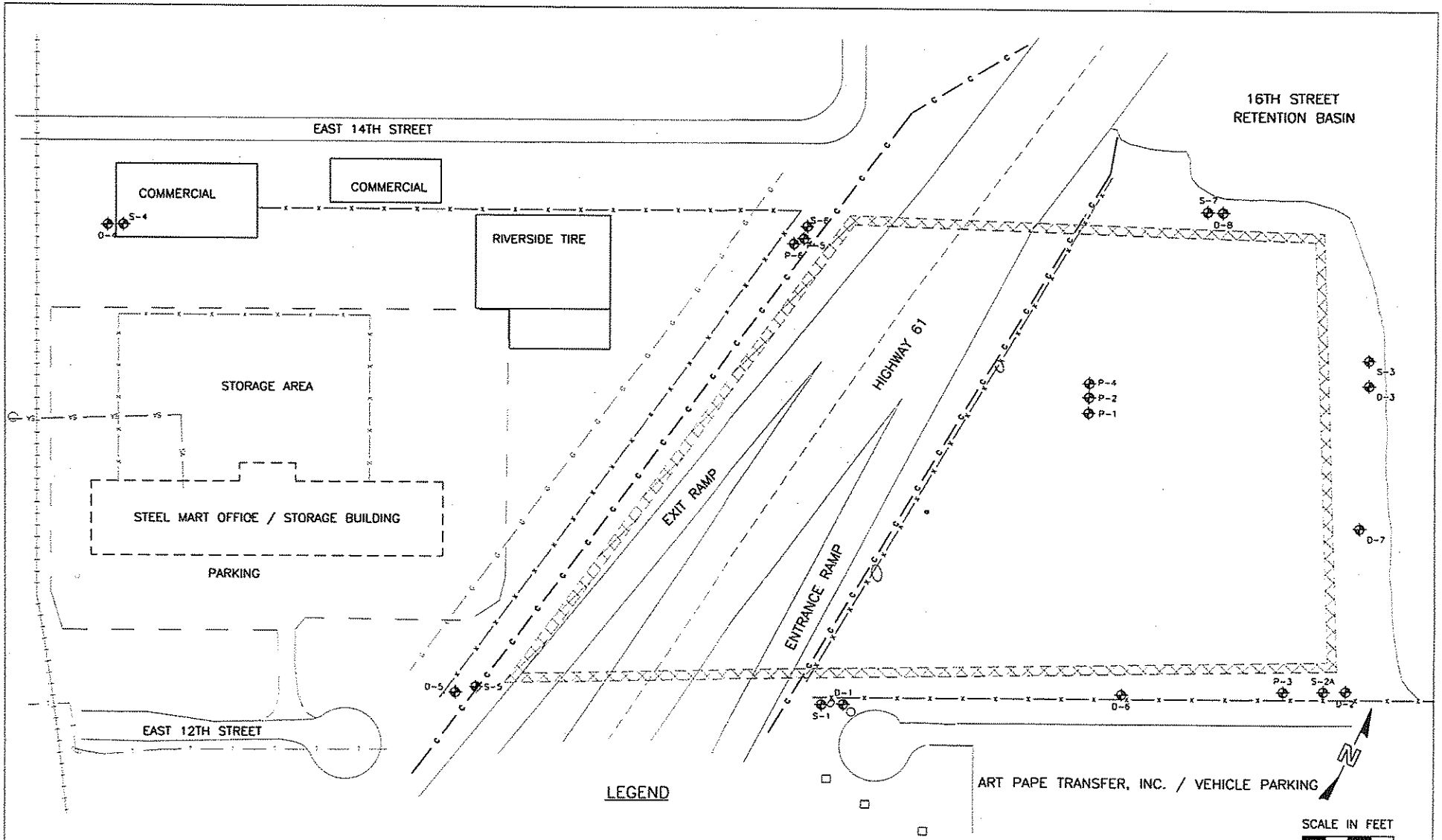
Contact telephone and e-mail numbers

Pat Murrow
(913) 551-7627
murrow.patricia@epa.gov

Attachment 1

Figure 1: Site Diagram

Source: 2005 Annual Post Closure Monitoring Report.
Prepared by Forest Road Consulting, Inc.
Dated September 18, 2005.



FOREST ROAD CONSULTING
DAVENPORT, IOWA

FORMER A.Y. McDONALD LANDFILL 2005 MAINTENANCE ACTIVITY SUMMARY DUBUQUE, IOWA	SITE DIAGRAM	
	FIGURE 1	DATE: 8/20/2005