

June 2010

OHIO E.P.A.

JUN 28 2010

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Environmental Protection Agency

Division of Emergency and Remedial Response



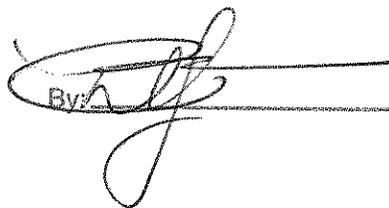
Decision Document

for the Remediation of

Franklin Steel Company (a.k.a. Columbus Steel Drum)
Franklin County, Ohio



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

By:  Date: 6-28-2010

Ted Strickland, Governor
Lee Fisher, Lt. Governor
Chris Korleski, Director

DECLARATION

SITE NAME AND LOCATION

Franklin Steel Company (formerly doing business as Columbus Steel Drum)
Blacklick, Franklin County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial alternative for the former Franklin Steel site located at 1385 Blatt Boulevard in Blacklick, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency (EPA), statutes and regulations of the State of Ohio, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Franklin Steel sampled soil, ground water, surface water and sediment to determine the nature and extent of site-related contamination, and conducted a baseline risk assessment to evaluate the risks to human health and the environment posed by the site. Elevated contaminant levels were found in the soils of the site's process operation area and in the sediments of the on-site storm water collection system and adjacent stream, Unzinger Ditch, a tributary to Blacklick Creek. Ground water contamination was detected, but the contamination was not found in the lower ground water zone used by the Jefferson Township Water Treatment Plant's public water supply wellfield.

The risk assessment evaluation showed that the site-related contamination poses unacceptable risks or hazards to human health and the environment, requiring the need for clean-up actions. The exposure risks associated with this site result from direct contact or ingestion of soils, sediments and ground water contaminated with heavy metals, semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs).

The contaminants that pose a threat to human health include metals (arsenic, chromium, iron and lead); polychlorinated biphenyl (PCB) Aroclor 1254; SVOCs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene and bis(2-ethylhexyl)phthalate); and VOCs (chloroethane, vinyl chloride, 1,1-dichloroethane, trichloroethene and total xylenes). The contaminants that pose a threat to the environment include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and SVOCs (anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, phenanthrene, pyrene and bis(2-ethylhexyl)phthalate).

DESCRIPTION OF THE SELECTED REMEDIAL ALTERNATIVE

The actual and threatened releases of industrial wastes at the site, if not addressed by implementing the remedial alternative selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to water pollution or soil contamination. Ohio EPA's selected remedial alternative includes:

- Excavation and removal of contaminated soil at the site.
- Excavation and removal of contaminated sediments from affected areas in Unzinger Ditch.
- A ground water monitoring program to confirm that the natural attenuation process is effective in limiting the migration and reducing the levels of contaminants in the ground water over time.

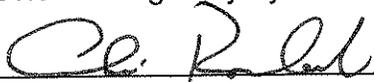
To address the soil contamination, Ohio EPA has selected the removal of contaminated soil from 22 localized on-site areas; the establishment of an environmental covenant to restrict the future use at the drum reconditioning operation facility to industrial/commercial purposes; and the development of a long-term operation and maintenance plan to control worker exposure and maintain existing capped areas of contaminated soil.

To address the sediment contamination, Ohio EPA has selected the removal of contaminated sediment from five target segments of Unzinger Ditch, from Franklin Steel's storm water holding ponds 15-inch outfall to the stream's confluence into Blacklick Creek.

To address the ground water contamination, Ohio EPA has selected monitored natural attenuation consisting of a minimum two-year compliance monitoring period to evaluate contaminant levels and indicator parameters to confirm that the natural attenuation process is occurring, followed by a three-year detection monitoring period to confirm that the cleanup goals continue to be met, and the establishment of an environmental covenant to prohibit the use of ground water for potable water purposes at the site. However, if the cleanup goals are not met at the end of the two years, then a contingent remedy would be developed and implemented.

STATUTORY DETERMINATIONS

The selected remedial alternative is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy uses permanent solutions and treatment technologies to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at the site. The effectiveness of the remedy will be reviewed regularly by Ohio EPA.



Chris Korleski, Director

Date 6/25/10

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ATTACHMENTS / APPENDICES

Appendix A	Wednesday, April 14, 2010 Public Hearing Transcript on Preferred Plan
Appendix B	Public Comments Received on Ohio EPA's February 2010 Preferred Plan

DECISION SUMMARY

for Franklin Steel Company (aka Columbus Steel Drum)
Franklin County, Ohio

1.0 SUMMARY OF SITE CONDITIONS

1.1 Site History

The Columbus Steel Drum Company, Inc. began operations in 1955, changing its name to the Franklin Steel Company in 1979. Columbus Steel Drum constructed the current drum reconditioning facility in 1971 at 1385 Blatt Boulevard in the Gahanna Industrial Park in Blacklick, Franklin County, Ohio (see **Figure 1**). The area surrounding the site has seen extensive commercial development since 1971 in the areas to the west, north and southeast. Immediately south of the site is the Conrail Railroad track. An extensive residential area was developed in 2005 to the southwest of the site. Approximately 2,600 feet northeast of the site is the Jefferson Township Water Treatment Plant's Taylor Road public water supply wellfield.

Franklin Steel owned and operated the 55-gallon drum reconditioning and recycling business from 1971 through 1997 under the business name of Columbus Steel Drum Company. Franklin Steel sold the drum reconditioning business to Evans Industries, Inc. in June 1997. Evans Industries operated the drum reconditioning business from 1997 through December 2002. The business was then leased and operated by Container Recyclers, Inc. from December 2002 through December 2007 using the Columbus Steel Drum Company business name. Property ownership throughout the various business ownership changes was retained by Franklin Steel. However, as of December 13, 2007, Franklin Steel sold part of the property (the 18-acre active operations area) to Columbus QCB, Inc., which was immediately acquired by Industrial Container Services LLC. The facility continues to operate under the business name of Columbus Steel Drum Company.

Franklin Steel's operations involved reconditioning and recycling of open head and closed head 55-gallon steel drums under the Standard Industrial Classification Code 7699. Prior to 1986, when drum inventory was at its peak, approximately 450,000 "RCRA empty" (*i.e.*, less than one inch of liquid) drums were stored at the site for processing. At that time, approximately 38 acres of property were utilized for drum storage and processing, two 10-acre drum storage (now inactive) areas and the 18-acre active processing/drum storage area. Since 1988, only the 18-acre portion of the site has been used for drum reconditioning/storage operations. Currently, there are approximately 56,000 drums being stored on the ground with an additional 11,000 drums stored inside numerous semi-trailers in the 18-acre active operations area.

The 18-acre active operations area reconditions approximately 5,000 used 55-gallon steel drums per day for resale. Closed-head drums are placed on a conveyor belt and transported to the process building where the drums are cleaned with a hot caustic

solution, rinsed, shot blasted to remove the old paint, and then repainted. Open-head drums are turned upside down on a conveyor belt to drain any liquids before they enter the thermal oxidizer (furnace). The oxidizer burns off any residual material remaining in the drum(s). The open-head drums are then sent into the process building for caustic rinse, shot blasting and repainting.

Drainage ditches at the site empty into three on-site storm water holding ponds that discharge through a 15-inch outfall into Unzinger Ditch (also known as Rosehill Run), a small tributary of Blacklick Creek. The discharge from the three on-site storm water holding ponds into Unzinger Ditch is regulated under a National Pollutant Discharge Elimination System (NPDES) permit issued by Ohio EPA's Division of Surface Water (DSW). The historical NPDES permit violation issues are being addressed under the terms of the Franklin County Environmental Court's July 2005 consent order between the State of Ohio and Container Recyclers, Inc. doing business as (d.b.a.) the Columbus Steel Drum Company.

The facility also operates an on-site wastewater pretreatment plant to remove solids, metals and oil and grease from the wastewaters generated during the drum reconditioning process prior to its discharge to the city of Columbus sanitary sewer system. The treated wastewater is regulated under the terms and conditions of the discharge permit issued by the Columbus Division of Sewerage and Drainage.

An Ohio EPA Emergency Response February 25, 1980 Initial Pollution Incident Report (Spill Incident No. 8002-25-0281) documented a spill of 15,000 to 20,000 gallons of hazardous waste sludge from the wastewater pretreatment plant's caustic clarifier, caused by an overflow of the system. The released sludge was observed to have entered the Blacklick Creek drainage system. The sediment and surface water sample results collected during Ohio EPA's five sampling events in 1980 found elevated levels of cadmium, chromium, lead, zinc, and phenol. Water samples from the storm water holding pond collected by Ohio EPA on December 5, 1985 found elevated levels of various VOCs, SVOCs, arsenic, cadmium, chromium, cyanide and lead.

An Ohio EPA March 20, 1987 inspection determined that contaminants had been released to the soil in seven different areas at Franklin Steel. Subsequent sampling of these areas found elevated levels of arsenic, cadmium, chromium, lead, ethanol, propanol, toluene, xylenes, and mineral spirits. On December 5, 1987, Ohio EPA requested Franklin Steel to remove the contamination at five of the seven areas, by excavating the first 18 inches of soil in a 15-foot radius, by February 1988.

In April and May 1989, U.S. EPA conducted a preliminary review/site visit inspection (PR/SVI) at the site. The purpose of the PR/SVI was to evaluate risk to the environment from the site through potential migration pathways. The PR/SVI report concluded that two areas of concern had potential releases to the environment: the oxidizer and associated waste management units and the dust collector storage units.

On June 23, 1992, Ohio EPA entered into an administrative consent order with Franklin Steel to perform a RCRA facility investigation (RFI) to determine the nature and extent of contamination from the releases of pollutants and wastes at the site, and to assess the potential risk to human health and the environment resulting from the site's contamination. The corrective measures study (CMS) used the data collected from the RFI to develop and evaluate potential remedial alternatives for the site.

In November 2000, Ohio EPA DSW completed its biological, sediment and physical habitat investigation of Unzinger Ditch, which was summarized in the document *Biological and Sediment Quality Study of Unzinger Ditch 2000*. For a copy of this report, refer to the internet location: <http://www.epa.ohio.gov/portals/35/documents/Unzinger.pdf>.

On July 6, 2005, the Franklin County Environmental Court issued a consent order and final judgment entry between the State of Ohio and Container Recyclers, Inc. d.b.a. Columbus Steel Drum Company. The terms of the consent order establish the tasks to be performed by Container Recyclers to address Ohio EPA's issues and concerns with the operating facility. The tasks include addressing the drum reconditioning operation's outdoor and indoor air contamination issues with the Division of Air Pollution Control (DAPC); the closure of the container storage pad with the Division of Hazardous Waste Management (DHWM); and the storm water holding pond's NPDES permit violations with DSW.

The RFI report was approved by Ohio EPA in March 2009. Through the course of the RFI activities, the extent of the soil and sediment contamination was defined, soil, ground water, surface water and sediment were sampled, and the sampling results were evaluated to determine the human health and ecological exposure risks posed by the site.

The CMS report was approved by Ohio EPA in July 2009 and outlines various options for addressing the threats to public health, safety and the environment that were identified during the RFI.

1.2 Summary of the RCRA Facility Investigation (RFI)

The RFI was conducted in two parts by Franklin Steel, and included sampling of soil, ground water, surface water and sediment to determine the nature and extent of site-related chemical contaminants. The investigation was conducted as Part 1 (September 1993 through December 2002) and Part 2 (January 2003 through October 2006) with oversight by Ohio EPA. The RFI report was approved by Ohio EPA on March 13, 2009. The data obtained from the investigation were used to conduct a baseline risk assessment (*i.e.*, an evaluation of the risks to human health and the environment posed by the site) and to determine the need to evaluate remedial alternatives.

Part 1 of the RFI included the evaluation of the following ten solid waste management units (SWMUs) at the site as shown in **Figure 2**.

- 1) SWMU S101, Stormwater Drainage System
- 2) SWMU S102, Sanitary Sewer Lines and Valve Pit
- 3) SWMU S103, Shot Blast Dust Collectors
- 4) SWMU S104, Former Shot Blast Storage Area
- 5) SWMU S105, Former Caustic Rinse System/Caustic Sludge Holding Tank
- 6) SWMU S106, Oxidizer System
- 7) SWMU S107, Drum Storage Area #1
- 8) SWMU S108, Drum Storage Area #2
- 9) SWMU S109, Drum Storage Area #3 [10-acre Former Drum Storage Area]
- 10) SWMU S201, Drum Storage Area #4 [10-acre Former Drum Storage Area]

Part 2 of the RFI was performed to evaluate the ten new areas of concern (AOCs) at the site described in Ohio EPA's January 31, 2003 letter and two additional AOCs described in Ohio EPA's May 16, 2006 letter. These 12 new AOCs included:

- 1) AOC A, Hazardous Waste Storage Area
- 2) AOC B, Shot Blast Dust Collector Area
- 3) AOC C, Shot Blast Dust Bags Storage Area
- 4) AOC D, Filter Press Sludge Storage Pad
- 5) AOC E, Former Hazardous Waste Storage Pad
- 6) AOC F, Drum Conveyor Chain Ash Fall-off Area
- 7) AOC G, Thermal Oxidizer Building Doorway Area
- 8) AOC H, Thermal Oxidizer Sludge Storage Area
- 9) AOC I, Heavy Drums Storage Pad
- 10) AOC J, Old Oxidizer Quench Pit Area
- 11) AOC K, Former Drum Storage Area – Trailer Parking Lot
- 12) AOC L, Newly Discovered Storm Water Outfall (#2)

During the RFI's Part 1 and Part 2, the following activities were conducted:

- Three hundred and forty-six soil samples were collected from both surface soil and soil boring locations, and also from ground water monitoring well boring locations in both the ten SWMUs and the 12 new AOCs. The soil samples were analyzed for Target Analyte List (TAL) metals and the Target Compound List (TCL) SVOCs and VOCs.
- Two hundred and eighty-four ground water samples were collected from 13 monitoring wells and six piezometers during the RFI's 24 separate sampling events. Three other piezometers were not sampled, but used to measure ground water elevations. The ground water samples were analyzed for both total and dissolved TAL metals and TCL SVOCs and VOCs.

- Fifty sediment samples were collected from the on-site storm water holding ponds, adjacent unnamed drainage ditches, Unzinger Ditch and Blacklick Creek. The sediment samples were analyzed for TAL metals and TCL SVOCs and VOCs.
- Twenty-one surface water samples were collected from the storm water holding ponds, adjacent drainage ditches and Unzinger Ditch. The surface water samples were analyzed for TAL metals and TCL VOCs and SVOCs.
- Ohio EPA's DSW completed in November 2000 the biological, sediment and physical habitat investigation of Unzinger Ditch performed to determine the appropriate aquatic use classification that would establish the protection standards in the ecological risk assessment (ERA).

The ten SWMUs and 12 new AOCs were grouped into the following three contiguous areas for separate evaluation in the Franklin Steel baseline risk assessment:

- Contiguous Area #1 (**Exposure Unit 1**) – The active operations area includes surface soils (0-2 feet below ground surface (bgs)) and subsurface soils (2 feet bgs to 10 feet bgs) from SWMUs S101 through S108 and new AOCs A through L surface soils (0-2 feet bgs). The total area encompasses approximately 18 acres.
- Contiguous Area #2 (**Exposure Unit 2**) – The inactive operations area includes surface soils and subsurface soils from SWMUs S109 and S201. These two areas encompass approximately ten acres each for a total of 20 acres.
- Contiguous Area #3 (**Exposure Unit 3**) - Sediment and surface water from Unzinger Ditch downstream of the 15-inch outfall at River Mile (RM) 0.6 and sediment upstream of the 15-inch outfall in Unzinger Ditch.

The nature and extent of COCs at Franklin Steel in each environmental medium are described in Sections 1.2.1 through 1.2.4.

1.2.1 Soil Contamination

During the RFI, 114 soil borings and nine piezometers/monitoring wells were installed in the active operations area (Exposure Unit 1), and 41 soil borings and 11 piezometers/monitoring wells were installed in the inactive operations area (Exposure Unit 2), for a total of 346 soil samples. The soil borings typically were installed to at least a depth of 12 feet bgs, and the deepest of the soil samples was collected at a depth of 19 feet bgs. A number of soil samples were collected from each boring to evaluate the vertical and horizontal extent of the site's contamination.

In Exposure Unit 1, the soil sampling results above the background concentrations and/or U.S. EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial screening levels, were evaluated in the human health risk assessment (HHRA) to identify the COCs that pose an exposure risk to the site worker's health. The HHRA identified a total of 14 COCs, which are listed here with their maximum detected value: the metals arsenic at 94 ppm, chromium at 1,120 ppm, iron at 166,000 ppm, and lead at 5,060 ppm; the PCB Aroclor 1254 at 1.0 ppm; the SVOCs benzo(a)anthracene at 24.4 ppm, benzo(a)pyrene at 24.2 ppm, benzo(b)fluoranthene at 28.1 ppm, benzo(k)fluoranthene at 24.2 ppm, dibenzo(a,h)anthracene at 0.96 ppm, bis(2-ethylhexyl)phthalate at 1,300 ppm and Indeno(1,2,3-cd)pyrene at 5.11 ppm; and the VOCs trichloroethene at 0.69 ppm and total xylenes at 720 ppm.

These 14 COCs are listed in Table 3.1 and Table 3.2 of the CMS report, which also lists the remedial action goal (or protection standard) for each COC. The lateral extent of contamination appears to be in various localized areas of elevated chemical concentrations ("hot spots") throughout the active operations area. The vertical extent of contamination appears to be limited to 0 – 2 feet bgs, except at Sample Location S108-SB13, which has contamination extending down to a depth of 7 – 8 feet bgs.

In Exposure Unit 2, the soil sampling results above the background concentrations and/or U.S. EPA's Region 9 PRGs for residential screening levels were then evaluated in the HHRA to identify the COCs that pose an exposure risk. The HHRA identified arsenic as the only COC in the inactive operations area. However, only one sample location each in SWMUs S109 and S201 had elevated arsenic concentrations above its remedial action goal to be considered as a COC. Subsequent soil samples at and around these two sample locations detected arsenic levels below the site-specific background level, and the elevated arsenic concentrations were attributed to naturally occurring deposits. Therefore, Exposure Unit 2 (SWMUs S109 and S201) was not evaluated in the HHRA, and was not considered for further corrective measures in the CMS.

1.2.2 Sediment Contamination

In Exposure Unit 3, the sediment sampling results above the more stringent (the lesser) value of either background concentrations, U.S. EPA Region 9 PRGs for residential exposure, or Ohio EPA's Division of Emergency and Remedial Response (DERR) ecological screening values for sediment, were evaluated in the ERA. However, calcium, iron, magnesium, potassium and sodium were not considered further in the ERA because they are naturally-occurring compounds and/or essential human nutrients. The ERA identified 19 ecological COCs (ecoCOCs) that pose a potential exposure risk to the animals or plant life from the contaminated sediment.

The 19 ecoCOCs are listed here with their maximum detected value: the metals arsenic at 37.1 ppm, cadmium at 10.1 ppm, chromium at 164 ppm, copper at 164 ppm, lead at 775 ppm, mercury at 0.57 ppm, nickel at 152 ppm and zinc at 954 ppm; the SVOCs

anthracene at 3.40 ppm, benzo(a)anthracene at 9.90 ppm, benzo(a)pyrene at 16.0 ppm, chrysene at 19.0 ppm, dibenzo(a,h)anthracene at 1.90 ppm, fluoranthene at 13.0 ppm, fluorene at 0.540 ppm, phenanthrene at 9.70 ppm, pyrene at 7.10 ppm, and bis(2-ethylhexyl)phthalate at 620 ppm, and total polycyclic aromatic hydrocarbons (PAHs). These 19 ecoCOCs are listed in Table 3-5 of the CMS report which also lists the remedial action goal (or protection standard) for each ecoCOC.

1.2.3 Ground Water Contamination

The site's surface soils consist primarily of low-permeability silty clay with an average thickness of 12 feet. However, some boreholes completed in the active operations area indicate the presence of fill materials in the upper 2 to 3 feet of soil that consist of fly ash from the former Columbus Municipal Power Plant and/or foundry sand from the former Claycraft brick-making facility.

The site is located on the west edge of a buried pre-glacial carved bedrock valley that trends northwest to southeast following the course of Blacklick Creek. Over 200 feet of sediments consisting of layers of glacially derived clay, silt, sand and gravel fill this bedrock valley, which is an extension of the Big Walnut and the Baltimore Buried Valley Aquifer systems.

Beneath the surface soils lies a 5 to 20 foot thick water-bearing sand and gravel layer that represents the upper ground water zone. Underlying this upper zone are less permeable deposits of clay and silty clay mixed with silt and sand and ranging in thickness from a few feet beneath most of the site to over 20 feet at Jefferson Township's Taylor Road wellfield. This low permeability layer separates the upper ground water zone from highly permeable sand and gravel deposits in the center of the buried valley which comprise the lower ground water zone. The public water supply wells at the Taylor Road wellfield draw water from this lower zone, approximately 50 to 70 feet bgs. The ground water pumping tests performed during development of the Taylor Road wellfield indicate semi-confined conditions in the lower ground water zone.

In general, ground water flows from the east and west flanks of the buried valley toward the center, eventually converging and flowing south-southeast along the valley's center. Water level data from Franklin Steel's monitoring wells and the Taylor Road wellfield indicate that the upper ground water zone flows predominantly in an east-northeasterly direction across the site towards the center of the buried valley. Along the extreme southern portion of the site, however, the ground water flows east-southeast.

Fifteen monitoring wells and nine piezometers were installed during the RFI to determine the nature and extent of ground water contamination at the site as shown by **Figure 3**. From May 1997 through October 2008, a total of 284 ground water samples were collected from 24 separate sampling events. These samples were collected from 13 monitoring wells (S101-MW01, S105-MW01, S108-MW03, S108-MW04, S108-MW05, S108-MW06D, S109-MW05D, S109-MW06, S201-MW02, JTMW-1S, JTMW-

1D, JTMW-3S and JTMW-3D) and six piezometers (S107-PZ01, S018-PZ01, S108-PZ02, S109-PZ01, S109-PZ02 and S109-PZ01). Two of the 15 monitoring wells (S100-MW01 and S107-MW02) were used only for background concentration ground water samples. Three piezometers (S100-PZ03, S109-PZ03 and S109-PZ04) were not sampled, but only used to measure ground water elevations to assist in the determination of the upper ground water zone's direction of flow.

In the 1997 to 2004 ground water sampling events, both unfiltered and filtered samples were collected using hand bailers that created high levels of turbidity in the samples. Following Ohio EPA technical guidance manual's recommendations, the 1997 – 2004 filtered sampling results (instead of the unfiltered results) and the 2006 – 2008 unfiltered sampling results collected using low-flow pumping methods were selected for use in the HHRA's ground water evaluation.

The ground water sampling results above the more stringent (the lesser) value of either background concentrations, U.S. EPA Region 9 PRGs for tap water, or federal drinking water maximum contaminant levels (MCLs) were evaluated in the HHRA. However, calcium, magnesium, potassium and sodium were not considered further in the HHRA because they were naturally-occurring compounds and/or essential human nutrients. The HHRA identified 22 COCs in the ground water that pose a potential exposure risk to human health, and are listed in Table 3.3 and Table 3.4 of the CMS report.

The 22 COCs are listed here with their maximum detected value: the metals aluminum at 8.87 ppm, antimony at 0.0072 ppm, arsenic at 0.405 ppm, barium at 0.78 ppm, beryllium at 0.40 ppm, cadmium at 0.0103 ppm, lead at 0.0116 ppm, manganese at 5.6 ppm, nickel at 0.34 ppm, thallium at 0.0102 ppm, vanadium at 0.0081 ppm and zinc at 0.20 ppm; the SVOCs benzo(a)anthracene at 0.00014 ppm, benzo(b)fluoranthene at 0.00021 ppm, bis(2-ethylhexyl)phthalate at 0.250 ppm, dibenzo(a,h)anthracene at 0.00014 ppm, and Indeno(1,2,3-cd)pyrene at 0.0025 ppm; and the VOCs chloroethane at 0.54 ppm, chloroform at 0.00097 ppm, 1,1-dichloroethane at 0.0180 ppm, methylene chloride at 0.0067 ppm and vinyl chloride at 0.0117 ppm.

These maximum concentrations of metals, SVOCs and VOCs were detected only once at seven different wells/piezometers in various sampling events, with no detections above the MCLs in the prior or subsequent sampling events except for arsenic, beryllium, bis(2-ethylhexyl)phthalate and the results from Monitoring Well S109-MW06. Arsenic has been detected above the MCL in the same three monitoring wells/piezometers in each of the RFI sampling events. However, beryllium was detected above the MCL in all of the monitoring wells/piezometers results from the March 2000 sampling event, but it was not detected again in any of the subsequent sampling events through October 2008.

Concentrations of bis(2-ethylhexyl)phthalate above the MCL were sporadically detected in six different monitoring wells/piezometers from July 1997 thru December 2003, then not detected again in the subsequent sampling events. However, the May 2009

sampling event results detected bis(2-ethylhexyl)phthalate above the MCL for the first time in eight years at Monitoring Wells S108-MW03, S108-MW04 and S201-MW02R.

Beginning in January 2003, vinyl chloride was detected above the MCL in Monitoring Well S109-MW06, and has shown an increasing trend for eight consecutive sampling events, with the maximum result of 0.0117 ppm detected in October 2008. However, this well has exhibited decreasing levels of chloroethane ranging from the maximum result of 0.46 ppm in June 1999 to 0.10 ppm in November 2006 and of 1,1-dichloroethane ranging from the maximum result of 0.018 ppm detected in June 1999 to 0.0012 ppm in October 2008. As shown in **Figure 3**, Monitoring Well S109-MW06 is located within the drinking water source protection area (five-year time-of-travel zone) calculated for the Jefferson Township's Taylor Road wellfield.

Most of the 22 COCs were only detected once above the MCLs in different monitoring wells, and were not detected again in the same well or other monitoring wells, so these compounds were not considered for further corrective measures in the CMS. Only chloroethane, 1,1-dichloroethane and vinyl chloride in the ground water were evaluated in the CMS. Because bis(2-ethylhexyl)phthalate was detected in the May 2009 sampling event above the MCL, Ohio EPA has added bis(2-ethylhexyl)phthalate as a COC in the upper ground water zone.

1.2.4 Surface Water Contamination

In Exposure Unit 3, the surface water sampling results above the lesser value of either background concentrations or U.S. EPA Region 9 PRGs for tap water were evaluated in the HHRA to identify the COCs that pose a human health exposure risk. However, calcium, iron, magnesium, potassium and sodium were not considered further in the HHRA because they are naturally-occurring compounds and/or essential human nutrients.

The HHRA evaluation identified 19 COCs, which are listed here with their maximum detected value: the metals aluminum at 4.54 ppm, antimony at 0.024 ppm, arsenic at 0.017 ppm, barium at 0.339 ppm, copper at 0.19 ppm, iron at 27.0 ppm, lead at 0.040 ppm, manganese at 1.72 ppm, thallium at 0.0016 ppm and vanadium at 0.090 ppm; the SVOCs 2-methylnaphthalene at 0.003 ppm, 4-methylphenol at 0.039 ppm, benzo(a)pyrene at 0.0011 ppm, benzo(b)fluoranthene at 0.0022 ppm, benzo(k)fluoranthene at 0.0012 ppm, bis(2-ethylhexyl)phthalate at 0.008 ppm and isophorone at 0.120 ppm; and the VOCs acetone at 0.810 ppm and chloroform at 0.002 ppm. These 19 COCs are listed in Table 3-7 and Table 3-8 of the risk assessment assumptions document but the detected compounds were below the human health exposure risk levels, so they were not considered for further corrective measures in the CMS.

However, the surface water sample analytical results were evaluated in the ERA to identify the COCs that pose an exposure risk to ecological receptors when compared to

Ohio EPA's Surface Water Quality Criteria. The ERA evaluation of the surface water results indentified various ecoCOCs that are above the remedial action objectives (RAOs.) Each of the ten ecoCOCs are listed here with their maximum detected value and their surface water quality criteria (in parenthesis): the metals aluminum at 4.54 ppm (0.250 ppm), barium at 0.339 ppm (0.220 ppm), copper at 0.19 ppm (0.010 ppm), cyanide at 0.050 ppm (0.012 ppm), lead at 0.040 ppm (0.0064 ppm), manganese at 1.72 ppm (0.100 ppm), and zinc at 0.49 ppm (0.120 ppm) and the SVOCs benzo(a)pyrene at 0.0011 ppm (0.000014 ppm), fluoranthene at 0.0075 ppm (0.00080 ppm), and pyrene at 0.0056 ppm (0.0046 ppm). These ecoCOCs are listed in Table 3.6 of the CMS report.

Because ecoCOCs in surface water were likely the result of sediment contamination, the ERA focused on sediment ecoCOCs and biological criteria. EcoCOCs in surface water typically diminish as a result of sediment removals and they were not addressed separately in the CMS.

1.2.5 Air Releases

The active operations area's outdoor and indoor air contamination issues are being addressed under the terms of the Franklin County Environmental Court's July 2005 consent order between the State of Ohio and Container Recyclers, Inc. d.b.a. Columbus Steel Drum Company.

1.3 Interim or Removal Actions Taken to Date

The following actions/closures have been conducted in the active operations area:

- December 1987, hot spot removal actions from five different locations.
- September 1988 closure plan submitted for the closure of SWMU S110 (Hazardous Waste Underground Storage Tank) and SWMU S111 (Hazardous Waste Storage Pad).
- December 1992, three underground storage tanks (USTs) were removed from an area located north of the wastewater pretreatment plant.
- September 1993, additional over-excavation and confirmatory sampling conducted at area of the three former USTs.
- May 2001, Bureau of Underground Storage Tank Regulations (BUSTR) Tier I evaluation completed for the three USTs removal and closure.
- June 4, 2007, BUSTR no further action (NFA) determination requested based on a benzene cleanup level of 5.3 ppm in the ground water and 37.6 ppm in the soil.

- June 19, 2007, BUSTR NFA issued for all three USTs previously located at Franklin Steel.
- June 2007, RCRA closure plan of the drum storage pad determined to have stored hazardous waste in excess of the regulatory 90 days (not the SWMU S111 pad) approved.
- March 2009, RCRA closure of the drum storage pad determined to store hazardous waste (not the SWMU S111 pad) completed.

1.4 Summary of Site Risks and Need for Remedial Action

A baseline risk assessment (*i.e.*, the HHRA and ERA) was conducted to evaluate current and potential future risks to human health and ecological receptors as the result of exposure to the contaminants present at the site. The results demonstrated that the existing contaminants in environmental media pose or potentially pose unacceptable risks and/or hazards to human and ecological receptors sufficient to trigger the need for remedial actions.

The conceptual site model shown by **Figure 4** describes the physical and chemical setting of Franklin Steel by combining historical site information with the data collected during the RFI field activities. Based on the history of the site and the results of site investigations, the primary sources of contamination are releases from past and ongoing drum reconditioning operations and waste management and storage practices. Primary release mechanisms may include direct release, leaching, erosion, and precipitation and associated runoff. Secondary sources of contamination at the site are the impacted surface and subsurface soils, sediment, and the upper ground water zone.

The environmental media directly impacted by the site's drum reconditioning activities are soil, sediments and ground water. Surface runoff is considered a transport medium because precipitation from previous storm events has carried COCs away from the on-site storm water holding ponds off-site to Unzinger Ditch. Ground water is considered a transport medium because leaching of COCs from impacted soils may occur into the upper ground water zone. Dust is considered a potential transport medium because COCs present in the soil may become entrained in fugitive dust emissions.

1.4.1 Risks to Human Health

1.4.1.1 Exclusion of Hot Spots

During the HHRA evaluation, various localized areas (hot spots) within Exposure Units 1 and 3 exhibited elevated concentrations of SVOCs and VOCs identified as COCs. These hot spots' values were excluded from the holistic risk assessment evaluation as these chemical concentrations interfered with the database population distribution. In the evaluation of these chemicals (and sample locations), it was apparent the ten hot

spots exceed human health risk standards and would be included as locations for further corrective actions under the CMS. The ten hot spots are shown in **Figure 2** and the chemicals identified exhibiting elevated concentrations are as follows.

Exposure Unit 1 – Active Operations Area – Surface Soil (0 to 2 feet bgs)

- Sample Location F-GP-18 had dibenzo(a,h)anthracene at 0.96 ppm.
- Sample Location S107-SB12 had bis(2-ethylhexyl)phthalate at 110 ppm, ethylbenzene at 210 ppm, toluene at 310 ppm and total xylenes at 720 ppm.
- Sample Location S107-SB11 had bis(2-ethylhexyl)phthalate at 1,300 ppm.
- Sample Location S107-SS05 had bis(2-ethylhexyl)phthalate at 1,000 ppm.
- Sample Location S107-SB07 had bis(2-ethylhexyl)phthalate at 230 ppm, ethylbenzene at 210 ppm and trichloroethene at 0.690 ppm.
- Sample Location S108-SB16/SS18 had bis(2-ethylhexyl)phthalate at 230 ppm.

Exposure Unit 1 – Active Operations Area – Subsurface Soil (2 to 10 feet bgs)

- Sample Location S108-SB13/SS15 had benzo(a)anthracene at 6.20 ppm, benzo(a)pyrene at 5.10 ppm and benzo(b)fluoranthene at 5.90 ppm.

Exposure Unit 3 – Unzinger's Ditch - Sediment

- Sample Location S101-SD24 had bis(2-ethylhexyl)phthalate at 620 ppm.
- Sample Location S101-SD25 had bis(2-ethylhexyl)phthalate at 400 ppm.
- Sample Location S101-SD07 had bis(2-ethylhexyl)phthalate at 100 ppm.

1.4.1.2 Risk Evaluation Summary

A HHRA was prepared to evaluate potential adverse impacts to human health posed by COCs in the on-site soil, sediment, ground water, and surface water; and Unzinger Ditch sediment and surface water based on data collected during the RFI. However, when site-specific data was not available, standard default values were used in the risk assessment's evaluation.

In Exposure Unit 1, nine metals and 13 SVOCs/PAHs were identified within the surface and subsurface soils above the RFI's screening levels for human health established by the use of U.S. EPA Region 9 PRGs for industrial risk exposure. The HHRA's evaluation identified within the surface and subsurface soils the following 14 COCs: the

metals arsenic, chromium, iron, lead; the PCB Aroclor 1254; the SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene; and the VOCs trichloroethene and total xylenes. Seven metals and bis(2-ethylhexyl)phthalate were identified as COCs in ground water; however, the presence of elevated metals in the background samples produce uncertainty concerning the identification of metals as COCs. Protection standards were developed for these COCs in both soil and ground water to assist in evaluating the need for any further corrective measures.

In the evaluation of the 42 identified soil sample locations identified with elevated COCs, six locations were determined to have a low risk potential and/or a calculated risk ratio below the lifetime cancer risk of $1E-5$ and/or the non-cancer hazard index (HI) of 1. For example, Soil Sample Location S100-SS09 is located in an area of limited human interaction; thus, potential exposure is low. This resulted in a total of 36 soil locations that warranted further evaluation in the CMS. Of the 36 soil locations identified for evaluation, several were located adjacent to one another facilitating the combination of various locations into one area for remediation. The combination of the 36 soil locations, which include the seven hot spots excluded from the HHRA, resulted in 22 soil areas within the active operations area that warrant corrective measures as shown in **Figure 2**.

The HHRA determined that in Exposure Unit 1, the non-cancer HI for all pathways for site workers is 1.6 and the total excess lifetime cancer risk is $4E-3$ (i.e., 4 in 1,000). For construction/utility workers, the HI for all pathways is 2.4 and the total excess lifetime cancer risk is $3E-3$. These values are in excess of the acceptable risk limits, HI of 1.0 and excess lifetime cancer risk of $1E-5$, which are explained in further detail in Section 2.0 REMEDIAL ACTION OBJECTIVES. In addition, lead was evaluated in the HHRA using a lead-specific U.S. EPA risk model to calculate that concentrations above 710 ppm would pose an unacceptable exposure risk to the site worker. Therefore, lead was determined to also be a COC for site workers. The COCs for soil are arsenic, chromium, iron, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, bis(2-ethylhexyl)phthalate, the PCB Aroclor 1254, trichloroethene and total xylenes. The main exposure pathway of concern is from ingestion of soils.

The RFI's sampling data show that bis(2-ethylhexyl)phthalate, chloroethane, vinyl chloride and 1,1 dichloroethane have migrated through the soil to contaminate the upper ground water zone underlying the active operations area in Exposure Unit 1. However, ground water modeling of the sampling results support the RFI's conclusion that these chemicals, which are exceeding their respective PRGs, are not migrating off-site in excess of the site-specific RAOs. These chemicals display limited potential for migration to ground water under observed site conditions and were not considered for active corrective measures.

In Exposure Unit 2, six metals were identified within the surface and subsurface soils above the RFI's screening levels for human health established by the lower value of background concentrations or U.S. EPA's Region 9 PRGs for residential risk exposure. The HHRA evaluation identified only arsenic as a COC within the surface and subsurface soils. However, only one sample location each in SWMUs S109 and S201 had elevated arsenic concentrations above its remedial action goal to be considered as a COC. Subsequent soil samples at and around these two sample locations detected arsenic levels below the site-specific background level, so the earlier elevated arsenic concentrations were attributed to naturally-occurring deposits. Therefore, Exposure Unit 2 (SWMUs S109 and S201) was not evaluated in the HHRA, and was not considered in the CMS for further corrective measures.

In Exposure Unit 3, three sediment "hot spots" were excluded from the HHRA because the chemical concentration interfered with the database population distribution. No other COCs were identified within the sediment and surface water above the RFI's screening levels for human health established by the lower value of background concentrations of U.S. EPA's Region 9 PRGs for residential risk exposure. Therefore, Exposure Unit 3 was not evaluated in the HHRA. However, the risk to ecological receptors in Exposure Unit 3 was evaluated in the ERA.

1.4.2 Risks to Ecological Receptors

An ERA was prepared to evaluate potential adverse impacts to ecological receptors posed by ecoCOCs in the Unzinger Ditch sediment and surface water based on data collected during the RFI. Unzinger Ditch (*i.e.*, Exposure Unit 3) was divided into two segments, downstream of the 15-inch outfall from the storm water holding ponds at River Mile (RM) 0.6 and upstream of the 15-inch outfall. This division of Unzinger Ditch was based on the Ohio EPA DSW designation of the stretch downstream of RM 0.6 as Warmwater Habitat and the stretch upstream of RM 0.6 as Limited Resource Water. The 15-inch outfall from Franklin Steel's storm water holding ponds discharges into Unzinger Ditch upstream from RM 0.6 as shown in Figure 1 of the DSW document, *Biological and Sediment Quality Study of Unzinger Ditch 2000*. The 2000 study identified that both sections of Unzinger Ditch were in non-attainment of the Ohio Water Quality Criteria.

The ERA expressed the effects of exposure to individual chemicals (the ecoCOCs) in Unzinger Ditch in units of hazard quotients (HQs). HQ refers to the effects of an individual chemical whereas HI refers to the combined effects of all chemicals. High HQs (above 1) in the lower segment of Unzinger Ditch are primarily from metals and SVOCs in the sediment contamination and were indicated primarily for aquatic biota. Few metals had concentrations high enough to cause ecological concern in the surface water of Unzinger Ditch, and releases of inorganic compounds from the 15-inch outfall's effluent into the downstream segment of Unzinger Ditch does not cause markedly higher concentrations in the downstream segment versus the upstream segment's surface water.

The ERA determined that eight metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) had HQs above 1 for sediment in the downstream segment of Unzinger Ditch. Of those eight metals, lead and cadmium posed the highest HQ values of 21.6 and 10.2, respectively. The upstream segment sampling indicated only six metals (arsenic, cadmium, copper, lead, mercury and zinc) with HQ values higher than 1. As with the lower segment, lead and cadmium posed the highest HQ values of 4.3 and 4.1, respectively.

The HQs for SVOCs were highest in the downstream segment of Unzinger Ditch. Nine SVOCs had HQs above 1 in the sediment in the downstream segment of Unzinger Ditch, whereas only benzo(a)anthracene had an HQ above 1 in the upstream segment; the HQs for the total SVOCs were 225 downstream and 53 upstream. Bis(2-ethylhexyl)phthalate had the most impact in the downstream segment of Unzinger Ditch with a HQ value of 67.

The ERA concluded that sediment within both segments of Unzinger Ditch has been impacted by ecoCOCs. The greatest accumulation of impact is downstream of the 15-inch outfall, at RM 0.54 (Broughton Road overpass). This area is subject to high sedimentation as the easterly flowing Unzinger Ditch takes a sharp bend south causing a sediment deposition bank on the easterly stream edge. Metals show the greatest sediment impact at RM 0.54, as these compounds tend to settle out in areas of low flow. Various SVOCs detected in the downstream sediment are the likely source of SVOC-impacted surface water in the downstream segment.

The ecoCOCs that pose a threat to the environment in Unzinger Ditch's sediment include the metals arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc; and the SVOCs anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, phenanthrene, pyrene and bis(2-ethylhexyl)phthalate.

The ERA also identified risks to ecological receptors from several surface water contaminants (as listed in Table 3.6 of the CMS); however, surface water is not addressed directly for further corrective measures in the CMS. Instead, the remedial alternatives address sediment contamination, which is the most likely source material for ecoCOC impacts in surface water.

2.0 REMEDIAL ACTION OBJECTIVES

As part of the RFI/CMS process, RAOs were developed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), codified at 40 CFR Part 300 (1990), as amended, which was promulgated under the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 et. seq., as amended, and U.S. EPA guidance. The RAOs are goals that a remedy should achieve in order to ensure the protection of

human health and the environment. The goals are designed specifically to mitigate the potential adverse effects of site COCs present in the environmental media.

PRGs for the protection of human health were established using the acceptable excess lifetime cancer risk and non-cancer hazard goals identified in the DERR technical decision compendium (TDC) document *Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for DERR Remedial Response and Federal Facility Oversight* dated April 26, 2004. These goals are given as 1E-5 (i.e., 1 in 100,000) excess lifetime cancer risk and a HI of 1, and were established using the default exposure parameters provided by U.S. EPA and/or site-specific information. This TDC document can be found at the Ohio EPA webpage:
<http://www.epa.ohio.gov/portals/30/rules/riskgoal.pdf>

The carcinogenic risk level refers to the increased likelihood that someone exposed to COCs at the site would develop cancer during his or her lifetime as compared with a person not exposed to the COCs at the site. For example, a 1 in 100,000 (equal to 1/100,000 or 1E-5) risk level means that if 100,000 people were chronically exposed to a carcinogen at the specified concentration, then there is a probability of one additional case of cancer in this population. Note that the risk levels refer only to the incremental risks created by exposure to the COCs at the site. They do not include the risks of cancer from other non-site related factors to which people could be exposed in their lifetime (e.g., smoking, poor diet).

Non-carcinogenic hazards are generally expressed in terms of a HI or HQ, which combines the concentration of chemical exposures with the toxicity of the chemicals (HI refers to the combined effects of all chemicals whereas HQ refers to the effects of an individual chemical). A HI of 1 represents the highest level of exposure at which no harmful effects are expected.

The RAOs developed for the site are detailed in **Table 1 Remedial Action Objectives Summary**. The RAOs for the site have been developed to address the pathways of exposure to contaminants of potential concern that were identified in the conceptual site model and evaluated by the human health and ecological risk assessments. Based on the results of the RFI and CMS, the site's contaminated soils create an unacceptable risk to local workers and the contaminated sediments cause an unacceptable risk to the stream's ecological receptors. The site will continue to be an industrial facility located in an industrial park into the foreseeable future, and the RAOs have been designed to be protective of human health and ecological receptors for this use designation.

Table 1 – Remedial Action Objectives Summary			
Pathway	Applicable Compounds	Target Level (ppm)	Basis
Soils – Human Receptors (H1)			
Protect human health by eliminating exposure (<i>i.e.</i> , direct contact, ingestion) to soils with concentrations of COCs in excess of regulatory or risk based standards.	Arsenic	39	Background ¹
	Chromium	210	Region 9 PRG ²
	Iron	100,000	Region 9 PRG ²
	Lead	710	Region 9 PRG ²
	Aroclor 1254	0.74	Region 9 PRG ²
	Benzo(a)anthracene	2.1	Region 9 PRG ²
	Benzo(b)fluoranthene	2.1	Region 9 PRG ²
	Benzo(k)fluoranthene	21.1	Region 9 PRG ²
	Benzo(a)pyrene	0.21	Region 9 PRG ²
	Dibenzo(a,h)anthracene	0.21	Region 9 PRG ²
	Indeno(1,2,3-cd)pyrene	2.1	Region 9 PRG ²
	Bis(2-ethylhexyl)phthalate	120	Region 9 PRG ²
	Trichloroethene	0.11	Region 9 PRG ²
	Xylenes	420	Region 9 PRG ²
Upper Ground Water Zone – Human Receptors (H2)			
Protect human health by eliminating exposure (<i>i.e.</i> , ingestion) to shallow ground water with concentrations of COCs in excess of regulatory or risk based standards.	Aluminum	3.60	Region 9 PRG ³
	Antimony	0.006	MCL ⁴
	Arsenic	0.010	Region 9 PRG ³
	Barium	2.00	MCL ⁴
	Beryllium	0.004	Region 9 PRG ³
	Cadmium	0.005	Region 9 PRG ³
	Lead	0.015	Region 9 PRG ³
	Manganese	0.880	Region 9 PRG ³
	Nickel	0.730	Region 9 PRG ³
	Thallium	0.002	MCL ⁴
	Vanadium	0.036	MCL ⁴
	Zinc	5.00	Region 9 PRG ³
	Benzo(a)anthracene	0.000029	Region 9 PRG ³
	Benzo(b)fluoranthene	0.000029	Region 9 PRG ³
	Bis(2-ethylhexyl)phthalate	0.006	MCL ⁴
	Dibenzo(a,h)anthracene	0.000029	Region 9 PRG ³
	1,1-Dichloroethane	0.0024	Region 9 PRG ³
	1,2-Dichloroethene	0.0050	MCL ⁴
	Indeno(1,2,3-cd)pyrene	0.000029	Region 9 PRG ³
	Chloroethane	0.217	RCRA MCL ⁵
	Chloroform	0.00019	Region 9 PRG ³
	Methylene Chloride	0.0048	Region 9 PRG ³
	Vinyl Chloride	0.002	MCL ⁴

Sediments – Ecological Receptors (E1)			
Prevent direct contact with contaminated off-site sediments and consumption of contaminated food (i.e., fish)	Arsenic	18	Sediment ⁶
	Cadmium	0.90	Sediment ⁶
	Chromium	40	Sediment ⁶
	Copper	34	Sediment ⁶
	Lead	34	Sediment ⁶
	Mercury	0.12	Sediment ⁶
	Nickel	42	Sediment ⁶
	Zinc	160	Sediment ⁶
	Anthracene	0.0572	Sediment ⁶
	Benzo(a)anthracene	0.108	Sediment ⁶
	Benzo(a)pyrene	0.150	Sediment ⁶
	Chrysene	0.166	Sediment ⁶
	Dibenzo(a,h)anthracene	0.033	Sediment ⁶
	Fluoranthene	0.423	Sediment ⁶
	Fluorene	0.0774	Sediment ⁶
	Phenanthrene	0.204	Sediment ⁶
	Pyrene	0.195	Sediment ⁶
	Bis(2-ethylhexyl)phthalate	9.30	SQB ⁷
Total PAHs	1.60	Sediment ⁶	
1. Value calculated from site-specific background sampling results 2. U.S. EPA Region 9 Preliminary Remediation Goal – industrial exposure 3. U.S. EPA Region 9 Preliminary Remediation Goal – tap water concentration 4. U.S. EPA Drinking Water Standards Maximum Contaminant Level 5. RCRA MCL = RCRA closure action maximum contaminant level 6. Ohio EPA Sediment Reference Value (2003) 7. SQB = sediment quality benchmark derived by toxicity calculation			

3.0 SUMMARY OF REMEDIAL ALTERNATIVES

Eleven remedial alternatives were considered for soil (four alternatives), sediment (four alternatives), and ground water (three alternatives) in the CMS report. A brief description of the major features of each of the 11 remedial alternatives follows. More detailed information about these alternatives can be found in the CMS report. Note, remedial alternatives for surface water were not considered because contaminated sediment is the primary source for chemical impacts in surface water, and the corrective measures implemented for sediment are expected to reduce the impacts of any ecoCOCs in surface water and result in the future attainment of chemical-specific and biological criteria.

3.1 Soil Alternatives

3.1.1 Soil Alternative #1 – No Action Alternative

The NCP requires evaluation of a "No Action" alternative to establish a baseline for the comparison of the other soil remedial alternatives proposed in the CMS report. Under this alternative, no active corrective measures are implemented for the COC-impacted soil at the site. The soil remains undisturbed in its present condition.

3.1.2 Soil Alternative #2 – Capping of Soil

Alternative #2 consists of a cap system for the 22 COC-impacted soil locations, which include the seven hot spots excluded from the HHRA, identified as requiring corrective measures to meet the RAOs. This alternative would include a new concrete cap for areas that are currently uncovered (approximately 29,500 square feet), and the maintenance of the existing concrete in areas that are currently covered (approximately 5,000 square feet) in the active operations area. Once completed, all capped/covered areas would serve as an engineering control to prevent site worker contact with COC-impacted soils beneath the concrete.

For the currently uncovered areas requiring corrective measures, up to 12 inches of soil would be removed so that the finished cap grade would be level with the surrounding land surface and promote positive drainage. Soil would be removed and transported off-site for disposal in a permitted, Subtitle D landfill. A 4- to 6-inch thick concrete cap with a gravel or sand base layer would then be constructed over the currently uncovered areas.

For currently covered areas over COC-impacted soils, observed defects would be repaired as needed.

Annual inspection and necessary repairs to the capped/covered areas that are part of this alternative would be conducted as part of long-term care under an operation and maintenance (O&M) plan developed by Franklin Steel. In addition, the O&M plan would provide notice for construction worker protection should the cover/cap be disturbed in the impacted areas. An institutional control proposed for this alternative would include establishing and recording an environmental covenant to restrict the property to industrial/commercial use in accordance with the Ohio Uniform Environmental Covenants Act, Ohio Revised Code (ORC) § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant.

3.1.3 Preferred Soil Alternative #3 (listed as #3A in CMS) – Removal of Soil from Uncovered Areas

Alternative #3 consists of excavating soil only from the currently uncovered (no concrete but gravel and/or soil) areas identified as requiring corrective measures to meet the RAOs. The areas currently covered by concrete would not be removed. The existing concrete covered areas will serve as an engineering control to prevent site worker contact with COC-impacted soils beneath the concrete.

Twenty-two COC-impacted soil areas, which include the seven hot spots excluded from the HHRA, were indentified in Exposure Unit 1 as shown in **Figure 3**. An average of 2 feet of soil depth would be excavated from 21 of the areas, and one area (Boring S107-SB12) would have soil removed to a depth of 7–8 feet. Five of these areas are partially covered with concrete, and 17 do not have any cover; their surface is gravel and/or soil. The total amount of COC-impacted soil from these 22 areas that needs to be removed is an estimated 4,300 tons from the approximately 29,500 square feet of uncovered surface area. Excavated areas would be backfilled with compacted, clean fill material, and the removed soil would be transported off-site for disposal in a permitted, Subtitle D landfill.

Annual inspection and repairs to existing concrete covered areas would be conducted as part of long-term care provided under an O&M plan developed by Franklin Steel. In addition, the O&M plan would provide notice for construction worker protection should the existing concrete covered area be disturbed in the COC-impacted areas. An institutional control proposed for this alternative would include establishing and recording an environmental covenant to restrict the property to industrial/commercial use in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to §5301.92, with Ohio EPA as a signatory to the covenant.

3.1.4 Soil Alternative #4 (listed as #3B in CMS) – Removal of Soil from Uncovered and Covered Areas

Alternative #4 consists of excavating soil from both the uncovered (no concrete but gravel and/or soil) and the existing concrete covered areas identified as requiring corrective measures to meet the RAOs. For currently covered areas, existing concrete would be removed prior to initiating soil excavation. Where removal is conducted in contiguous covered areas, a new layer of concrete would be installed as the final surface cover.

Twenty-two COC-impacted soil areas, which include the seven hot spots excluded from the HHRA, were indentified in Exposure Unit 1 as shown in **Figure 3**. An average of 2 feet of soil depth would be excavated from 21 identified areas, and one location (Boring S107-SB12) would have soil removed to a depth of 7–8 feet. Five of these areas are partially covered with concrete, and 17 do not have any cover; their surface is gravel and/or soil. The total amount of impacted soil from these 22 areas that needs to be removed is an estimated 5,000 tons from the approximately 34,500 square feet of covered and uncovered areas. Excavated areas would be backfilled with compacted fill material. Soil would be removed and transported off-site for disposal in a permitted, Subtitle D landfill.

An institutional control proposed for this alternative would include establishing and recording an environmental covenant to restrict the property to industrial/commercial use in accordance with the Ohio Uniform Environmental Covenants Act, ORC §5301.80 to §5301.92, with Ohio EPA as a signatory to the covenant.

3.2 Sediment Alternatives

3.2.1 Sediment Alternative #1 – No Action Alternative

The “No Action” alternative is evaluated to establish a baseline for comparison of the other sediment remedial alternatives proposed in the CMS. Under this alternative, no active corrective measures would be implemented for the ecoCOC-impacted sediment in Unzinger Ditch. The sediment would remain undisturbed in its present condition. In addition, ecological impacts to surface water would not be addressed.

3.2.2 Sediment Alternative #2 – Capping of Sediment

Alternative #2 consists of a cap system for stream sediment identified as requiring corrective measures to meet the RAOs in Unzinger Ditch as shown in **Figure 5**. A 4- to 6-inch thick geomembrane/geotextile clay liner would be installed over the current ecoCOC-impacted sediment areas, dependent on confirmation sampling results, visual observation, and/or the absence of appreciable sediment. Therefore, the extent of impacted sediment capping in Unzinger Ditch can vary: from the entire stream’s lower reach of approximately 3,500 linear feet that encompasses its confluence at Blacklick Creek (Sample Location S101-SD26) to the storm water holding pond’s 15-inch outfall into the stream (Sample Location S101-SD07) to only selected portions of the stream’s lower reach that is estimated at 1,440 linear feet. The three hot spots excluded from the HHRA (Sediment Sample Locations S101-SD07, S101-SD17, and S101-SD18) would also be capped. Before performing the sediment capping activities, Franklin Steel would need to obtain permits from both the U.S. Army Corps of Engineers and the Ohio EPA DSW.

Annual inspection and necessary repairs to the capped areas that are part of this alternative would be conducted as part of long-term care for the stream under an O&M plan developed by Franklin Steel. In addition, surface water would need to be periodically sampled for the duration of the cap system as an indicator of the effectiveness of the sediment remediation.

An institutional control proposed for this alternative would include establishing and recording an environmental covenant on the property to restrict disturbance of the sediment’s cap in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant.

3.2.3 Preferred Sediment Alternative #3 (listed as #3A in CMS) – Sediment Removal, Five Target Reaches

Alternative #3 - *Five Target Reaches* consists of excavating ecoCOC-impacted sediment, dewatering as necessary, transporting and disposal at an approved landfill from five targeted stream reaches (estimated to be approximately 1,440 linear feet) to meet the RAOs in Unzinger Ditch. The sediment removal areas are located in the lower

reach of Unzinger Ditch from its confluence at Blacklick Creek (Sediment Sample Location S101-SD26) to the storm water holding pond's 15-inch outfall into the stream (Sediment Sample Location S101-SD07) as shown in **Figure 5**. The sediment removal areas are estimated to consist of:

- Reach 1: Blacklick Creek Confluence (0 feet) to 150 feet, average width 14 feet
- Reach 2: 1,000 to 1,320 feet (320 feet), average width of 14 feet
- Reach 3: 2,200 to 2,600 feet (400 feet), average width of 8 feet
- Reach 4: 2,750 to 3,100 feet (350 feet), average width of 6 feet
- Reach 5: 3,300 to 3,520 feet (220 feet), average width of 6 feet

The three hot spots excluded from the HHRA (Sample Locations S101-SD07, S101-SD17, and S101-SD18) would also be included in the sediment removal operation.

Before performing the sediment removal activities, Franklin Steel would need to obtain permits from both the U.S. Army Corps of Engineers and the Ohio EPA DSW. After clearing vegetation and installing erosion controls, an average of 12 inches of sediment would be excavated from the five target reaches to an average channel width of seven feet. Excavated areas may need to be backfilled with compacted fill material, clay and top soil to match the existing grade. The total amount of sediment that would be removed from these five stream areas is estimated to be 950 tons from approximately 13,200 square feet, dependent on confirmation sampling results, visual observation, and/or the absence of appreciable sediment. Once the sediment removal operation is completed, the stream would be restored by landscaping and vegetation as needed according to the terms and schedule of the required permits.

One of the goals in removing contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's chemical-specific and biological criteria.

3.2.4 Sediment Alternative #4 (listed as #3B in CMS) – Sediment Removal, Lower Segment Reach

Alternative #4 - *Lower Segment Reach* consists of excavating ecoCOC-impacted sediment, dewatering as necessary, transporting and disposal at an approved landfill from Sediment Sample Locations S101-SD26 to S101-SD07 (approximately 3,500 linear feet) to meet the RAOs in Unzinger Ditch. This length of stream is from Unzinger Ditch's confluence at Blacklick Creek to just upstream of the storm water holding pond's 15-inch outfall into the stream as shown in **Figure 5**. The three hot spots excluded from the HHRA (Sediment Sample Locations S101-SD07, S101-SD17, and S101-SD18) would also be included in the sediment removal operation.

Before performing the sediment capping activities, Franklin Steel would need to obtain permits from both the U.S. Army Corps of Engineers and the Ohio EPA DSW. An average of 9 inches of sediment would be excavated from the stream's lower segment reach, with an estimated average channel width of 7.6 feet. Excavated areas may need

to be backfilled with compacted fill material, clay and top soil. The total amount of sediment that needs to be removed from the lower segment reach is estimated to be 1,450 tons from approximately 26,800 square feet, dependent on the results of the confirmation sampling results. Once the sediment removal operation is completed, the stream would be restored by landscaping and vegetation as needed according to the terms and schedule of the required permits.

One of the goals in removing contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's chemical-specific and biological criteria.

3.3 Ground Water Alternatives

3.3.1 Ground Water Alternative #1 – No Action Alternative

The "No Action" alternative is evaluated as a baseline for comparison to the other ground water remedial alternatives proposed in the CMS. Under this alternative, no active corrective measures or periodic ground water monitoring would be implemented at the site.

3.3.2 Preferred Ground Water Alternative #2 – Monitored Natural Attenuation with Institutional Controls

Alternative #2 consists of monitored natural attenuation as the primary mechanism to address COCs in the upper ground water zone. Natural attenuation relies on naturally occurring physical, chemical, and biological processes in the subsurface materials at the site to limit migration and potentially reduce concentrations of SVOCs/VOCs in the upper ground water zone over time.

As part of this alternative, an enhanced monitoring program for the upper ground water zone would be implemented under an O&M plan developed by Franklin Steel. The ground water monitoring program would begin three to six months after the completion of the soil removal activities and continue for a period of at least five years. Ground water sampling data would be used to evaluate concentrations of COCs, to analyze trends in concentration levels and to determine if the concentration levels meet the RAOs for ground water. In addition, the monitoring program would include sampling and analysis for appropriate indicator parameters to confirm that natural attenuation is occurring in the subsurface materials. The enhanced ground water monitoring program would consist of a minimum two-year compliance period followed by a three-year detection monitoring period.

During the two-year compliance period, ground water samples would be collected semiannually from six monitoring wells (S107-MW02, S101-MW01R, S109-MW06, S109-PZ02, S109-MW07 and S201-MW02) and analyzed for VOCs, SVOCs, metals and natural attenuation indication parameters. The natural attenuation indication parameters would signify biological activity in the ground water is occurring, and these

parameters include alkalinity, chlorides, dissolved oxygen and sulfates. Statistical trend analysis of the sampling data results would be performed to evaluate any trends in the concentrations of COCs over time. Ground water flow and contaminant fate and transport modeling would also be performed to estimate the rate and extent of migration of the COCs from the site.

If RAOs are met for all COCs at the end of the two-year compliance period, then three years of detection monitoring would be conducted to verify that natural attenuation is occurring and RAOs continue to be met. Statistical trend analysis would be conducted to verify that COC concentrations are decreasing over time and remain below the RAOs. For the detection monitoring period, ground water samples would be collected semiannually from the same six monitoring wells used for the compliance period's monitoring. The samples would be analyzed for VOCs and all the appropriate natural attenuation indicator parameters.

If RAOs are not met for all COCs at the end of the two-year compliance period, but the COC levels are stable or decreasing as shown by the statistical trend analysis, then the compliance monitoring period would continue until the RAOs are met in the upper ground water zone followed by the detection monitoring period. However, if the COC levels are increasing as shown by the statistical trend analysis, a contingent remedy would be developed and implemented by Franklin Steel. The contingent remedy would require the evaluation and selection of an active remediation system by Franklin Steel to reduce the levels of COCs. The active remediation option employed could be the extraction of COC-impacted groundwater followed by *ex situ* treatment and discharge of the treated water as outlined in Ground Water Alternative #3. A ground water monitoring program would be developed including, but not limited to, the activities performed for compliance and detection monitoring periods as described above.

An institutional control proposed for this alternative would include establishing and recording an environmental covenant on the property to prohibit the use of ground water for potable water purposes in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant.

3.3.3 Ground Water Alternative #3 – Ground Water Extraction and Treatment

Alternative #3 consists of the extraction of COC-impacted upper ground water zone system followed by *ex situ* treatment and discharge of the treated ground water. Ground water from Monitoring Well S109-MW06, which has had detections of chloroethane, 1,1-dichloroethane, and vinyl chloride concentrations greater than its RAO, would be recovered through one or more extraction wells. The construction of the extraction and treatment system components would require state construction and operating permits from Ohio EPA DAPC and DSW.

The area targeted for ground water recovery is defined by chloroethane, vinyl chloride, and 1,1-dichloroethane concentrations detected in the ground water samples collected from Monitoring Well S109-MW06 as shown in **Figure 3**. Recovered ground water would be treated and then discharged to a nearby stream or drainage ditch under an NPDES permit issued by Ohio EPA DSW. However, an *ex situ* treatment component for this alternative may be required to meet NPDES permit requirements. If required, treatment could be accomplished using a packaged treatment system designed to remove the COCs from the recovered ground water. The system would likely use a low profile air stripping unit to remove the chloroethane, 1,1-dichloroethane, and vinyl chloride from the ground water. The stripped chloroethane, 1,1-dichloroethane, and vinyl chloride would be part of the vapor stream, and captured in a carbon polishing unit before discharge to the atmosphere under a permit-to-operate from DAPC. After passing through the packaged system, the treated ground water would be discharged under the terms of the NPDES permit from DSW.

As part of this alternative, a monitoring program for the upper ground water zone would be developed and implemented under an O&M plan developed by Franklin Steel. Ground water sampling data would be used to evaluate the progress of the removal of COCs from the impacted ground water, and to determine when the concentrations meet the RAOs for ground water. Periodic ground water samples would be collected from six monitoring wells (S107-MW02, S101-MW01R, S109-MW06, S109-PZ02, S109-MW07 and S201-MW02) and analyzed for VOCs.

An institutional control proposed for this alternative would include establishing and recording an environmental covenant on the property to prohibit the use of ground water for potable water purposes in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant.

4.0 COMPARISON AND EVALUATION OF ALTERNATIVES

4.1 Evaluation Criteria

In selecting a remedy for a contaminated site, Ohio EPA considers the following eight evaluation criteria as outlined in U.S. EPA's NCP promulgated under CERCLA (40 CFR 300.430):

1. Overall protection of human health and the environment - Remedial alternatives shall be evaluated to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site.

2. Compliance with all applicable or relevant and appropriate requirements (ARARs) - Remedial alternatives shall be evaluated to determine whether a remedy will meet all of the applicable or relevant and appropriate requirements of state and federal environmental laws.
3. Long-term effectiveness and permanence - Remedial alternatives shall be evaluated to determine the ability of a remedy to maintain reliable protection of human health and the environment over time once pollution has been abated and RAOs have been met. This includes assessment of the residual risks remaining from untreated wastes, and the adequacy and reliability of controls such as containment systems and institutional controls (*i.e.*, an environmental covenant).
4. Reduction of toxicity, mobility, or volume through treatment - Remedial alternatives shall be evaluated to determine the degree to which recycling or treatment are employed to reduce toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.
5. Short-term effectiveness - Remedial alternatives shall be evaluated to determine the following: (1) short-term risks that might be posed to the community during implementation of an alternative; (2) potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; (3) potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and (4) time until protection is achieved.
6. Implementability - Remedial alternatives shall be evaluated to determine the ease or difficulty of implementation and shall include the following as appropriate: (1) technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of the remedy; (2) administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-site actions); and (3) availability of services and materials, including the availability of adequate off-site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; the availability of services and materials; and the availability of prospective technologies.
7. Cost - Remedial alternatives shall evaluate costs and shall include the following: (1) capital costs, including both direct and indirect costs; (2) annual O&M costs; and (3) net present value of capital and O&M costs. The cost estimates include only the direct costs of implementing an alternative at the site and do not include other costs, such as damage to human health or the environment associated with an alternative. The cost estimates are based on figures provided by the CMS.

8. Community acceptance - Remedial alternatives shall be evaluated to determine which of their components interested persons in the community support, have reservations about, or oppose. This assessment is not to be completed until public comments on the Preferred Plan are considered.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative that has accomplished the goal of protecting human health and the environment and has complied with the law. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria used to select the best remedial alternative(s) identified in the Preferred Plan. Evaluation Criterion 8, community acceptance, is a modifying criterion that is evaluated through public comments on the remedial alternatives received during the comment period, which ended April 23, 2010. Section 7.0 provides the Responsiveness Summary regarding all comments received and notes any changes to the site's preferred remedial alternative based upon these comments.

4.2 Analysis of Evaluation Criteria

This section examines how each of the evaluation criteria is applied to each of the remedial alternatives presented in Section 3.0 and compares how the alternatives achieve the desired criteria. These analyses have been provided for each medium of concern, with the names of specific remedial alternatives shown in italics.

4.2.1 Overall Protection of Human Health and the Environment

4.2.1.1 Soil

Alternative #1 (No Action) would not modify or reduce the potential for exposure to COC-impacted soil. The soil would remain in its present condition. The RAOs established for the impacted soil and the corrective measures objectives would not be met under this alternative.

Alternative #2 (Soil Capping) would protect human health by preventing direct contact with COCs that exceed RAOs, thereby rendering the exposure pathway incomplete. The institutional controls for Alternative #2 would limit future site use to commercial and/or industrial development. The engineering controls would maintain existing concrete covered and newly concreted covered areas to prevent site workers' direct contact with any COC-impacted soil beneath these areas, maintain long-term concrete cover integrity and provide notice for construction worker protection should the concrete cover need to be disturbed or breached.

Alternative #3 (Soil Removal From Uncovered Areas) would protect human health by removing COC-impacted soil from currently uncovered areas and preventing direct contact with COCs that exceed the RAOs, thereby rendering the exposure pathway incomplete. The institutional controls for Alternative #3 would limit future site use to

commercial and/or industrial development. The engineering controls would maintain existing concrete covered areas to prevent site worker direct contact with COC-impacted soil beneath the covered areas, maintain long-term concrete cover integrity and provide notice for construction worker protection should the concrete be disturbed or breached.

Alternative #4 (Soil Removal From Uncovered and Covered Areas) would protect human health by removing both the concrete cover and impacted soil in all the areas where COCs exceed the criteria for requiring corrective measures, thereby rendering the exposure pathway incomplete. The institutional controls for *Alternative #4* would protect human health by limiting future site use to commercial and/or industrial development. Engineering controls would not be necessary for this alternative.

Alternative #1 would not change the existing site soil conditions to improve the protection of human health and the environment. *Alternatives #2* and *#3* would provide increased protection of human health and the environment by preventing direct contact with the COC-impacted soil. *Alternative #4* would provide a higher degree of protection for human health by the entire removal of the COC-impacted soil from both the uncovered and covered areas.

4.2.1.2 Sediment

Alternative #1 (No Action) would not modify or reduce the potential for exposure to ecoCOC-impacted sediment. The sediment would remain in its present condition. The RAOs established for the impacted sediment would not be met under this alternative, nor would ecological issues in surface water be addressed.

Alternative #2 (Sediment Capping of Lower Segment Reach) would protect the stream's biological communities by preventing direct contact with ecoCOC-impacted sediment that exceeds RAOs, thereby rendering the exposure pathway incomplete.

Alternative #3 (Sediment Removal of Five Target Reaches) would protect the stream's biological communities by removing ecoCOC-impacted sediment that exceeds RAOs from selected areas of the stream, thereby rendering the exposure pathway incomplete.

Alternative #4 (Sediment Removal of Lower Segment Reach) would protect the stream's biological communities by removing ecoCOC-impacted sediment that exceeds RAOs from the stream's entire lower portion, thereby rendering the exposure pathway incomplete.

Alternative #1 would not change the existing stream sediment conditions to improve the protection of the environment. *Alternative #2* would provide increased protection of the environment by preventing direct contact with the ecoCOC-impacted sediment. *Alternatives #3* and *#4* would provide increased protection of the environment by the removal of the ecoCOC-impacted sediment from the stream. One of the goals in

capping and removing the contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's chemical-specific and biological criteria.

4.2.1.3 Ground Water

Alternative #1 (No Action) does not protect human health because it does not remediate the ground water nor establish institutional controls to prohibit the use of ground water for potable water purposes. And in the case of monitored natural attenuation, does not monitor ground water or evaluate the effectiveness of the natural attenuation process to reduce the levels of COCs.

Alternative #2 (Monitored Natural Attenuation with Institutional Controls) would protect human health through the expected natural reduction process of COCs-impacted ground water over time. This alternative would rely on the ability of the organic compounds in the upper ground water zone to decrease over time through naturally occurring processes. The effectiveness of the reduction process would be evaluated through periodic ground water monitoring events. However, if the expected reduction in COC levels does not occur in the upper ground water zone, *Alternative #2* would require the development and implementation of a contingent remedy (such as Ground Water *Alternative #3*) to protect human health. The institutional control for *Alternative #2* would protect human health by prohibiting the use of ground water for potable water purposes.

Alternative #3 (Ground Water Extraction and Treatment) would protect human health by reducing concentrations of chloroethane, 1,1-dichloroethane, and vinyl chloride below the RAOs, and should also reduce concentrations of any other SVOCs and VOCs. The effectiveness of the treatment system to reduce the levels COCs would be evaluated through periodic ground water monitoring events. The institutional control for *Alternative #3* would protect human health by prohibiting the use of ground water for potable water purposes.

Alternative #3 would provide protection of human health and the environment by reducing the concentrations, and further migration of COCs, in the upper ground water zone. Institutional controls associated with *Alternatives #2* and *#3* would also provide overall protection of human health.

4.2.2 Compliance with ARARs

4.2.2.1 Soil

Alternative #1 (No Action) would not meet any ARARs for minimizing the site worker's exposure to COC-impacted soils.

Alternative #2 (Soil Capping) would only remove enough surface soil from the site for off-site disposal such that the final elevation of the newly installed concrete cover would

be consistent with adjacent concrete cover. The soil removal and capping activities would be subject to state and federal regulations for transport of waste materials. Disposal of COC-impacted soil would be subject to the permit requirements of the accepting landfill facility. The institutional control portion of this alternative would require that an environmental covenant be placed on the property pursuant to the Ohio Uniform Environmental Covenants Act, Ohio Revised Code § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant. The environmental covenant would restrict the property to industrial or commercial use.

Alternative #3 (Soil Removal from Uncovered Areas) would only remove the COC-impacted soil from the site's uncovered areas for off-site disposal. However, *Alternative #4* (Soil Removal from Uncovered and Covered Areas) would remove both the concrete cover and the COC-impacted soil beneath it for off-site disposal in addition to the COC-impacted soil from the uncovered areas. Alternatives #3 and #4 would be subject to state and federal regulations for the transport of waste materials. Disposal of COC-impacted soil and concrete debris would be subject to the permit requirements of the accepting landfill facility. The institutional control portion of these alternatives would require that an environmental covenant be placed on the property pursuant to the Ohio Uniform Environmental Covenants Act, Ohio Revised Code § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant. The environmental covenant in Alternatives #3 and #4 would restrict the property to industrial/commercial use.

Alternatives #2, #3 and #4 would require the establishment of institutional controls to restrict the future land use of the property. Additionally, these alternatives would involve the removal and off-site disposal of impacted soil, which would be subject to applicable regulations and permits for transport and landfill disposal.

4.2.2.2 Sediment

Alternative #1 (No Action) would not meet any ARARS for minimizing the exposure of biological receptors to ecoCOC-impacted sediment, nor would ecological issues in surface water be addressed.

Alternative #2 (Capping of Sediment of Lower Segment Reach) may remove ecoCOC-impacted sediment from Unzinger Ditch for off-site disposal during the sediment cap construction activities, which would be subject to state and federal regulations for transport of waste materials. Disposal of ecoCOC-impacted sediment would be subject to the permit requirements of the accepting landfill facility. Permits from both the U.S. Army Corps of Engineers and Ohio EPA DSW would need to be obtained by Franklin Steel before performing the sediment cap construction activities. The institutional control portion of this alternative would require that an environmental covenant be placed on the property pursuant to the Ohio Uniform Environmental Covenants Act, Ohio Revised Code § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant. This environmental covenant would prohibit excavation activities in the stream to prevent disturbance of the sediment's cap.

Alternatives #3 (Sediment Removal of Five Target Reaches) and *#4* (Sediment Removal of Lower Segment Reach) both remove ecoCOC-impacted sediment from Unzinger Ditch for off-site disposal subject to state and federal regulations for transport of waste materials. Disposal of ecoCOC-impacted sediment would be subject to the permit requirements of the accepting landfill facility. Permits from both the U.S. Army Corps of Engineers and Ohio EPA DSW, would need to be obtained by Franklin Steel before performing the sediment removal activities.

Alternative *#2* would require the establishment of an institutional control to prevent disturbance of the sediment's cap. Alternatives *#3* and *#4* would involve the removal, and off-site disposal of impacted soil, which would be subject to applicable regulations and permits for transport and landfill disposal. Before performing the sediment removal activities, Alternatives *#3* and *#4* would require U.S. Army Corps of Engineers and Ohio EPA DSW permits and all sediment removal activities would be subject to the permit terms and requirements. One of the goals in removing the contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's chemical-specific and biological criteria.

4.2.2.3 Ground Water

Alternative #1 (No Action) would not meet any ARARS for minimizing direct contact with, and the ingestion of, COC-impacted ground water.

Alternative #2 (Monitored Natural Attenuation with Institutional Controls) would require that an environmental covenant be placed on the property pursuant to the Ohio Uniform Environmental Covenants Act, Ohio Revised Code § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant. The environmental covenant would prohibit the use of ground water for potable water purposes.

Alternative #3 (Ground Water Extraction and Treatment) would include *ex situ* treatment involving the extraction and treatment of ground water. Installation and construction of the extraction and treatment system components would require Ohio EPA construction and operating permits. Discharge permits, such as a NPDES permit issued by Ohio EPA DSW and a permit to operate issued by Ohio EPA DAPC, would also be required for the system's operation. The institutional control portion of Alternative *#3* would require that an environmental covenant be placed on the property pursuant to the Ohio Uniform Environmental Covenants Act, Ohio Revised Code § 5301.80 to § 5301.92, with Ohio EPA as a signatory to the covenant. The environmental covenant would prohibit the use of ground water for potable water purposes.

Alternatives *#2* and *#3* would involve compliance with the requirements of Ohio EPA DAPC and DSW permits. In addition, Alternatives *#2* and *#3* would require the establishment of institutional controls to prevent the use of ground water for potable water purposes.

4.2.3 Long-Term Effectiveness and Permanence

4.2.3.1 Soil

Alternative #1 (No Action) does not provide any long-term effectiveness and permanence to reduce the extent and amount of the COC-impacted soils.

The long-term reliability and effectiveness of *Alternative #2* (Soil Capping) would depend on the quality of the concrete cover's construction and the ability to maintain the cover's integrity over time. It is not a permanent remedy. Concrete cover maintenance would require long-term management. A well-maintained cap would effectively and reliably minimize exposure to COC-impacted soil. The institutional control portion of this alternative would restrict future land by establishing an environmental covenant to restrict the property to industrial/commercial use. The environmental covenant is an effective long-term and permanent method to restrict the property's future land use.

The proposed soil removal in *Alternatives #3* (Soil Removal from Uncovered Areas) and *#4* (Soil Removal from Uncovered and Covered Areas) is an effective and permanent method to reduce the exposure risks from the COC-impacted soil. By removing the impacted soil sources from the site, COCs migration and exposure would be prevented and/or eliminated. For *Alternative #3*, long-term effectiveness would also depend on the ability to maintain the concrete cover's integrity over time. A well-maintained concrete cover would effectively and reliably minimize exposure to COC-impacted soils. Concrete cover maintenance would require long-term management. *Alternative #4* would not require long-term maintenance or management because it removes the COC-impacted soils. The institutional control portion of *Alternatives #3* and *#4* would restrict future land use by establishing an environmental covenant to restrict the property to industrial/commercial use. The environmental covenant is an effective long-term and permanent method to restrict the property's future land use.

Alternatives #2 and *#3*, which rely upon maintaining existing concrete pavement and/or capping currently uncovered areas with concrete, in whole or in part, would provide an effective long-term barrier to direct contact with COC-impacted soil but would be dependent on the quality of the long-term maintenance to maintain its integrity over time. These alternatives are not permanent remedies. *Alternative #4* would provide an effective and long-term permanent remedy, due to the removal of soils with concentrations of COCs exceeding the RAOs. *Alternatives #2* and *#3* would rely on long-term maintenance of concrete covered areas, and the establishment of institutional controls to permanently restrict the property to industrial/commercial use.

4.2.3.2 Sediment

Alternative #1 (No Action) does not provide any long-term effectiveness and permanence to reduce the ecoCOC-impacted sediment exposure risk, nor would ecological issues in surface water be addressed.

The long-term reliability and effectiveness of *Alternative #2* (Sediment Capping of Lower Segment Reach) would depend on the quality of cap construction and the ability to maintain cap integrity over time. It is not a permanent remedy. However, a well-maintained cap would effectively minimize exposure to the stream's ecoCOC-impacted sediment. The institutional control portion of this alternative would require the establishment of an environmental covenant on the property to prohibit excavation activities in the stream to prevent disturbance of the sediment's cap. The environmental covenant is an effective long-term and permanent method to restrict the excavation activities in the stream.

The proposed sediment removal in *Alternatives #3* (Sediment Removal of Five Target Reaches) and *#4* (Sediment Removal of Lower Segment Reach) is an effective long-term and permanent method of remediation. By removing the impacted sediment from the stream, ecoCOC-impacted sediment migration and exposure would be prevented.

Alternative #2 relies on capping to provide an impervious barrier to direct contact with impacted sediment, but would be dependent on long-term maintenance to preserve its reliability over time. *Alternatives #3* and *#4* would both provide an effective and permanent remedy, because it would remove impacted sediment from Unzinger Ditch that has concentrations of ecoCOCs exceeding the RAOs. One of the goals in removing the contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's chemical-specific and biological criteria.

4.2.3.3 Ground Water

Alternative #1 (No Action) does not provide for routine ground water monitoring to determine the long-term effectiveness of the natural attenuation processes to reduce the levels of COCs, nor does this alternative establish a permanent prohibition of using ground water for potable water purposes.

Alternative #2 (Monitored Natural Attenuation with Institutional Controls) involves evaluating and monitoring the long-term effectiveness of natural attenuation processes in reducing the levels of COCs by the periodic sampling of selected monitoring wells. The monitoring wells would need to be maintained for a limited period of time (until it is established that natural attenuation processes are occurring or not occurring). The institutional controls for this alternative would rely on the establishment of an environmental covenant on the property to prohibit the use of ground water for potable water purposes. The environmental covenant is an effective long-term and permanent method to restrict contact with, or ingestion of, COCs in the ground water. However, if the expected reduction in COC levels does not occur in the upper ground water zone, *Alternative #2* requires the development and implementation of a contingent remedy (such as *Alternative #3* below).

Alternative #3 (Ground Water Extraction and Treatment) involves a ground water extraction and treatment system to reduce the levels of COCs. The long-term

effectiveness and permanence of the treatment system would be dependent upon the continuous withdrawal of ground water from the aquifer to maximize the recovery of COC-impacted ground water. Periodic ground water compliance monitoring would be necessary to evaluate the effectiveness of the treatment system to decrease the levels of COCs in the upper ground water zone. The institutional controls for this alternative would rely on the establishment of an environmental covenant on the property to prohibit the use of ground water for potable water purposes. The environmental covenant is an effective long-term and permanent method to restrict contact with, or ingestion of, COCs in the ground water.

Alternatives #2 includes monitoring wells that would need to be maintained for a limited period of time. Alternative #3 includes an active treatment system that would need to be continuously operated over an extended period of time to be effective.

4.2.4 Reduction of Toxicity, Mobility or Volume by Treatment

4.2.4.1 Soil

Alternative #1 (No Action) would not reduce the toxicity, mobility, or volume of COCs in the impacted soils.

Alternative #2 (Soil Capping) would reduce the potential mobility of the COCs in the impacted soil. However, this alternative would not reduce the volume and toxicity of the COCs in the impacted soil.

Alternatives #3 (Soil Removal from Uncovered Areas) and *#4* (Soil Removal from Uncovered and Covered Areas) would reduce toxicity and mobility by reducing the volume of COC-impacted soil. *Alternative #3* would remove a portion of the COC-impacted soil, while *Alternative #4* would remove all COC-impacted soil identified as exceeding the RAOs.

4.2.4.2 Sediment

Alternative #1 (No Action) would not reduce the toxicity, mobility, or volume of ecoCOCs in the impacted sediment or surface water.

Alternative #2 (Sediment Capping of Lower Segment Reach) would reduce the potential mobility of ecoCOCs in the impacted sediment and surface water. However, this alternative would not reduce the volume and toxicity of the ecoCOCs in the impacted sediment but would reduce the volume and toxicity of the ecoCOCs in surface water.

Alternatives #3 (Sediment Removal of Five Target Reaches) and *#4* (Sediment Removal of Lower Segment Reach) would reduce the toxicity and mobility by reducing the volume of ecoCOC-impacted sediment within Unzinger Ditch. *Alternative #3* would only remove sediment from selected areas of Unzinger Ditch; it would likely remove

most of the ecoCOC-impacted sediment by targeting depositional areas in the stream. *Alternative #4* would remove all the ecoCOC-impacted sediments from Unzinger Ditch. Removal of contaminated sediments would be expected to result in the reduction of the toxicity, mobility or volume of ecoCOCs in surface water.

4.2.4.3 Ground Water

Alternative #1 (No Action) may naturally reduce the toxicity, mobility, and volume of COCs in the ground water through combined physical, chemical, and biological attenuation processes. However, the actual existence of the natural attenuation process has not been established, and if it is occurring, the effectiveness of these natural attenuation processes in achieving this goal would not be evaluated and monitored through routine ground water sampling.

If occurring, *Alternative #2* (Monitored Natural Attenuation with Institutional Controls) would naturally reduce the toxicity, mobility, and volume of the COCs in the upper ground water zone through combined physical, chemical, and biological attenuation processes.

Alternative #3 (Ground Water Extraction and Treatment) would reduce the toxicity, mobility, and volume of the COCs in the upper ground water zone.

4.2.5 Short-Term Effectiveness

4.2.5.1 Soil

Alternative #1 (No Action) would not implement any active corrective measures, and there would not be any short-term exposure risks due to remedy implementation or construction.

Alternative #2 (Soil Capping) would involve installation of a concrete cover over the COC-impacted soil areas, and could cause significant disruption to the active facility operations, particularly if it is required to temporarily shut the operations down or to relocate them. Construction activities and heavy equipment could pose a potential risk to employees during the COC-impacted soil removal operation. Employees could also come into contact with COC-impacted soil as it is being removed and staged prior to off-site disposal. Construction workers involved with the cover's construction and removing limited amounts of soil could have a potentially increased short-term exposure risk to COC-impacted soil if not carefully monitored. Construction workers involved with the concrete cover construction would wear appropriate personal protective equipment (PPE) to minimize their short-term exposure risk during the concrete cover installation and construction. Once construction activities were completed, there would be no further short-term effects on employees or construction workers and active facility operations could return to normal.

Alternatives #3 (Soil Removal from Uncovered Areas) and #4 (Soil Removal from Uncovered and Covered Areas) would involve removal of the COC-impacted soil, and could cause significant disruption to the active facility operations, particularly if it is required to temporarily shut the operations down or to relocate them. Construction activities and heavy equipment could pose a potential risk to employees during the COC-impacted soil removal operation. Employees could also come into contact with COC-impacted soil as it is being removed and staged prior to off-site disposal. Construction workers removing the soil and handling materials during the excavation and removal process could have a potentially increased short-term exposure risk to COC-impacted soil if not carefully monitored. Construction workers involved with the soil removal operation would wear appropriate PPE to minimize their short-term exposure risk during the soil removal. Once construction activities were completed, there would be no further short-term effects on employees or construction workers and active facility operations could return to normal.

Alternatives #3 and #4 would have the highest potential for short-term effects to employees and construction workers due to disruption of active facility operations, construction activities and the active handling of COC-impacted surface soil during remedy implementation. Alternative #2 would have a lower potential for short-term effects on employees and construction workers than Alternatives #3 and #4 due to the limited amount of impacted soil removal and the non-disturbance of the existing concrete covered areas. For Alternatives #2, #3 and #4, short-term exposure risks can be addressed through proper use of PPE by construction workers and employees, and safe construction practices.

4.2.5.2 Sediment

Alternative #1 (No Action) would not implement any active corrective measures and there would not be any short-term exposure risks due to remedy implementation or construction activities.

Alternative #2 (Sediment Capping of Lower Segment Reach) would involve construction of a cap over the areas of ecoCOC-impacted sediment, and could cause significant disruption to the ecosystem of the stream, particularly if the stream bank has to be cleared of vegetation, the stream has to be dewatered or water flow has to be re-routed. Construction workers could have potentially increased short-term exposure risks from the ecoCOC-impacted sediments during cap construction. Trespassers entering the stream's work zone would also have potential risks from the cap construction activities and heavy equipment operation. Construction workers involved with cap construction would wear appropriate PPE to minimize their short-term exposure risk to ecoCOCs in sediment. It would likely take the stream's ecosystem an extended period of time to fully recover after the completion of the cap construction activities.

Alternatives #3 (Sediment Removal of Five Target Reaches) and #4 (Sediment Removal of Lower Segment Reach) both involve the removal of the ecoCOC-impacted

sediment, and could cause significant disruption to the ecosystem of the stream, particularly if the stream bank has to be cleared of vegetation, the stream has to be dewatered or water flow has to be re-routed, and sediment has to be removed or managed. Construction workers removing sediment and handling materials during the excavation and dewatering process could have a potentially increased short-term exposure risk from the ecoCOC-impacted sediment. Trespassers entering the stream's work zone would also have potential risks from the sediment removal activities and heavy equipment operation. Construction workers involved with sediment removal would wear appropriate PPE to minimize their short-term exposure risk to ecoCOCs in sediment. It would likely take the stream's ecosystem an extended period of time to fully recover after the completion of the sediment removal activities.

Alternatives #3 and #4 would have the highest potential for short-term effects due to disruption of the stream's ecosystem and active handling of ecoCOC-impacted sediment. Alternative #2 would have a lower potential for short-term effects on construction workers than Alternatives #3 and #4 due to the relatively low-disturbance of the existing ecoCOC-impacted sediment. For Alternatives #2, #3 and #4, short-term exposure risks can be addressed through proper use of PPE and safe construction practices.

4.2.5.3 Ground Water

Alternative #1 (No Action) would not implement any active corrective measures and there would not be any short-term exposure risks due to remedy implementation or construction.

Alternatives #2 (Monitored Natural Attenuation with Institutional Controls) and #3 (Ground Water Extraction and Treatment) both involve periodic sampling of selected ground water monitoring wells. Sampling of the monitoring wells would not be disruptive to operations at the facility or to employees. Workers involved with the sampling of ground water could have a potentially increased short-term exposure from the COC-impacted ground water. Workers involved with ground water sampling would wear appropriate PPE during sampling events to minimize exposure to the COCs in the ground water.

Alternative #3 (Ground Water Extraction and Treatment) involves the installation and operation of the ground water extraction and treatment system and construction activities could potentially have a short-term effect on operations at the facility and employees. However, it is possible to locate the extraction and treatment system in an area at the site where it would have minimal effect on facility operations and employees. Workers involved with construction, system operations, and ground water sampling would wear appropriate PPE to minimize their exposure to COCs in the ground water.

Alternative #3 would have the highest potential for short-term effects on employees, construction workers and other workers due to construction of the extraction and

treatment system and operation of the system. For both Alternatives #2 and #3, short-term exposure risk can be addressed through proper use of PPE and safe construction practices.

4.2.6 Implementability

4.2.6.1 Soil

Alternative #1 (No Action) does not contain any active corrective measures requiring implementation for COC-impacted soil.

For *Alternative #2* (Soil Capping) installation of a concrete cover over COC-impacted soil areas would be implementable, but the construction activities would have to contend with being located in the active operations area (drum storage, conveyor chains, truck trailers, etc). For the institutional controls portion of this alternative to be effective, the environmental covenant would need to be executed and then maintained over time by the current property owner (who is not Franklin Steel).

For *Alternative #3* (Soil Removal from Uncovered Areas) removal of COC-impacted soil from uncovered areas would be relatively implementable, but the construction activities would have to contend with being located in the active operations area (drum storage, conveyor chains, truck trailers, etc). For the institutional controls portion of this alternative to be effective, the environmental covenant would need to be executed and then maintained over time by the current property owner (who is not Franklin Steel).

For *Alternative #4* (Soil Removal from Uncovered and Covered Areas) removal of COC-impacted soil from covered and uncovered areas would not be easily implementable, as most of the covered portions of the impacted soil are beneath the active operations area, which is supported by the 2- to 3-foot wide slabs of concrete. Removing and excavating soil, and then installing a concrete cover in this area, would result in a major disruption to the active facility operations. For the institutional controls portion of this alternative to be effective, the environmental covenant would need to be executed and then maintained over time by the current property owner (who is not Franklin Steel).

The equipment, material, technology, and contractors would be readily available to implement the removal of COC-impacted soil and/or installation of concrete cover proposed by Alternatives #2, #3 and #4. Landfills are also readily available in the area for the disposal of impacted soil. The institutional control portion of Alternatives #2, #3 and #4 would need to be executed and then maintained over time by the current property owner (who is not Franklin Steel) to be effective.

4.2.6.2 Sediment

Alternative #1 (No Action) does not contain any active corrective measures requiring implementation for ecoCOC-impacted sediment.

For *Alternative #2* (Sediment Capping of Lower Segment Reach) the installation of a cap over the areas of ecoCOC-impacted sediment is more involved than the proposed sediment removal operations in *Alternatives #3* and *#4*, but the cap installation would be implementable. Capping of sediment would be a more complicated corrective action to implement due to the installation of the liner system over the stream banks and the need to periodically monitor surface water to ensure the cap's effectiveness. In addition, the institutional control portion of this alternative would need the environmental covenant to be established by the multiple property owners affected by the sediment capping operation.

For *Alternatives #3* (Sediment Removal of Five Target Reaches) and *#4* (Sediment Removal of Lower Segment Reach) the removal and dewatering of ecoCOC-impacted sediment areas in Unzinger Ditch would be readily implemented. As required in *Alternative #2*, the stream bank would have to be cleared of vegetation, and the stream's water flow would have to be rerouted. However, *Alternatives #3* and *#4* sediment removal involves a dewatering process operation and storage area, but does not include an environmental covenant to prohibit the disturbance of the stream's sediment.

The equipment, material, technology, and contractors would be readily available to implement the proposed removal and dewatering of impacted sediment and/or the proposed capping of impacted sediment by *Alternatives #2*, *#3* and *#4*. Landfills are also readily available in the area for the disposal of the impacted sediment. In addition, the appropriate permits would have to be obtained before the start of any disturbance activity in the stream's sediment.

4.2.6.3 Ground Water

Alternative #1 (No Action) does not contain any active corrective measures requiring implementation for ground water.

Alternative #2 (Monitored Natural Attenuation with Institutional Controls) includes a period of both compliance and detection ground water monitoring events. Monitoring ground water quality through sampling, laboratory analysis and evaluation of the extent of natural attenuation in the upper ground water zone would be technically feasible. A potable water use restriction would need to be implemented and maintained over time by the current property owner (who is not Franklin Steel) and Franklin Steel's portion of the property by the establishment of an environmental covenant on the site.

Alternative #3 (Ground Water Extraction and Treatment) involves the construction and operation of a ground water extraction and treatment system, which would use readily available technology, equipment, material and contractors. Additional hydraulic testing may be required to properly design the recovery system. Effective pretreatment to meet permit requirements for the system's discharged water can be achieved using standard industrial wastewater treatment equipment. State and local permits for treating and

discharging ground water would need to be obtained prior to implementing this alternative. Depending on the rate of COC reduction achieved over time, the extraction system would likely need to remain operational for an extended period (estimated at 2 years), and system repairs and component replacement would need to be addressed throughout the life of the system.

Alternatives #2 and #3 would require the establishment of institutional controls. None of the three alternatives would have any significant technical implementation issues that preclude their implementation.

4.2.7 Cost

Cost estimates to implement the remedial alternatives for soil, sediment and ground water are provided below in separate summary tables. Each table lists the capital costs, the annual O&M costs, and the net present value (based on the total costs evaluated for a 30-year period) as presented in the approved CMS. These costs may be subject to change or refinement during the future remedial design.

4.2.7.1 Soil

Alternative	Capital Cost	Annual O&M Cost	Net Present Value
Alternative #1 No Action	\$ 0	\$ 0	\$ 0
Alternative #2 Capping of Impacted Soil	\$ 408,650	\$ 18,800	\$ 698,000
Alternative #3 Removal of Soil from Uncovered Areas Only	\$ 511,900	\$ 10,000	\$ 666,000
Alternative #4 Removal of Soil from Uncovered and Covered Areas	\$ 707,150	\$ 0	\$ 707,150

4.2.7.2 Sediment

Alternative	Capital Cost	Annual O&M Cost	Net Present Value
Alternative #1 No Action	\$ 0	\$ 0	\$ 0
Alternative #2 Capping of Impacted Sediment Lower Segment Reach	\$ 540,900	\$ 35,000	\$ 1,079,000
Alternative #3 Removal of Sediment from Five Target Reaches	\$ 432,500	\$ 6,300	\$ 444,000
Alternative #4 Removal of Sediment from Lower Segment Reach	\$ 482,500	\$ 11,300	\$ 541,000

4.2.7.3 Ground Water

Alternative	Capital Cost	Annual O&M Cost	Net Present Value
Alternative #1 No Action	\$ 0	\$ 0	\$ 0
Alternative #2 Monitored Natural Attenuation with Institutional Controls	\$ 18,800	\$ 67,500	\$ 203,000
Alternative #3 Ground Water Extraction, Treatment and Recovery System	\$ 142,500	\$ 78,100	\$ 356,000

4.2.8 Community Acceptance

The Ohio EPA received comments from interested parties during the public comment period, which ended on April 23, 2010, and at the public meeting held at the Gahanna Lincoln High School on April 14, 2010. Those comments and Ohio EPA's responses are included in the Responsiveness Summary (Section 7.0).

4.3 Summary of Evaluation Criteria

4.3.1 Soil

Table 2: Evaluation of Remedial Alternatives for the Franklin Steel Site

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
(1) Overall protection of human health and the environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Compliance with ARARs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(3) Long term effectiveness and permanence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(4) Reduction of toxicity, mobility or volume through treatment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(5) Short term effectiveness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(6) Implementability	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(7a) Capital Cost	---	\$408,650	\$511,900	\$707,150
(7b) Net Present Value	---	\$698,000	\$666,000	\$707,150
(8) Community acceptance	<i>Community acceptance of the preferred alternatives will be evaluated after the public comment period.</i>			
<input checked="" type="checkbox"/> Fully meets criteria	<input checked="" type="checkbox"/> Partially meets criteria	<input type="checkbox"/> Does not meet criteria		

4.3.2 Sediment

Table 3: Evaluation of Remedial Alternatives for the Franklin Steel Site

<i>Evaluation Criteria</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4</i>
<i>(1) Overall protection of human health and the environment</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(2) Compliance with ARARs</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(3) Long term effectiveness and permanence</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(4) Reduction of toxicity, mobility or volume through treatment</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(5) Short term effectiveness</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(6) Implementability</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(7a) Capital Cost</i>	---	\$540,900	\$432,500	\$482,500
<i>(7b) Net Present Value</i>	---	\$1,079,000	\$444,000	\$541,000
<i>(8) Community acceptance</i>	<i>Community acceptance of the preferred alternatives will be evaluated after the public comment period.</i>			
<input checked="" type="checkbox"/> <i>Fully meets criteria</i> <input checked="" type="checkbox"/> <i>Partially meets criteria</i> <input type="checkbox"/> <i>Does not meet criteria</i>				

NOTE: Alternative 3 = removal of impacted sediment from Five Target Reaches
Alternative 4 = removal of impacted sediment from Lower Segment Reach

4.3.3 Ground Water

Table 4: Evaluation of Remedial Alternatives for the Franklin Steel Site

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
(1) Overall protection of human health and the environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Compliance with ARARs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(3) Long term effectiveness and permanence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(4) Reduction of toxicity, mobility or volume through treatment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(5) Short term effectiveness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(6) Implementability	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(7a) Capital Cost	---	\$18,800	\$142,500
(7b) Net Present Value	---	\$203,000	\$356,000
(8) Community acceptance	Community acceptance of the preferred alternatives will be evaluated after the public comment period.		
<input checked="" type="checkbox"/> Fully meets criteria <input checked="" type="checkbox"/> Partially meets criteria <input type="checkbox"/> Does not meet criteria			

5.0 SELECTED REMEDIAL ALTERNATIVE

Ohio EPA's selected remedial alternative is a combination of three of the 11 alternatives detailed in Section 3.0 (and in the CMS report); each alternative provides corrective measures to address the different impacted environmental media at the site - soil, sediment and ground water. The elements of the selected remedial alternatives are as follows: *Soil Alternative #3* Removal of Soil from Uncovered Areas; *Sediment Alternative #3* Sediment Removal of Five Target Reaches; and *Ground Water Alternative #2* Monitored Natural Attenuation with Institutional Controls.

Ohio EPA believes that the combination of the three selected remedial alternatives will be protective of human health and the environment, be relatively easy to implement, and provide cost effective remediation. The total net present value for the selected remedial alternatives is estimated at \$1,313,000 (based on the cost estimates in the CMS). Note that the number of ground water monitoring events increased from eight in

the CMS to ten in the Preferred Plan and the number of wells sampled increased from six to eight at each sampling event, which would slightly increase O&M costs. When implemented, the selected combination of preferred remedial activities will reduce or eliminate the potential for exposure to the metals, SVOCs and VOCs found at, and emanating from, the drum reconditioning operations at the site.

Based on information currently available, Ohio EPA believes the selected remedial alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to balancing and modifying criteria. The Ohio EPA expects the selected remedial alternative to satisfy the following requirements: 1) overall protection of human health and the environment; 2) compliance with ARARs; 3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility or volume through treatment; and 5) cost effectiveness.

The combined elements of Ohio EPA's selected remedial alternative are as follows:

5.1 Soil Excavation - Soil Alternative #3 Removal of Soil from Uncovered Areas

The selected remedial alternative for COC-impacted soil is the removal of soil from the 22 uncovered (no concrete) areas where COC concentrations exceeding the RAOs listed in **Table 1 Remedial Action Objectives Summary, Soil – Human Receptors (H1)** have been identified (see **Figure 2**). Under Soil Alternative #3, existing concrete covered areas will not be disturbed but be maintained intact as an engineering control to prevent contact with COC-impacted soil that may exist under them. An average of 2 feet of soil will be excavated from 21 areas and transported for off-site disposal at a permitted Subtitle D landfill, and one area (S107-SB12) will have soil removed to a depth of 7–8 feet. Where removal is conducted in contiguous concrete covered areas (five total), the concrete will be replaced as needed. Excavated areas will be backfilled with compacted clean fill material to match the surrounding grade.

This alternative also includes the development of an O&M plan detailing the annual inspection and maintenance of the existing five concrete covered areas of COC-impacted soil where the concentrations exceed the RAOs; and an institutional control to restrict the future use of the site to industrial/commercial.

Performance Standards: Ohio EPA will consider the contaminated soil removal operation successful when the following items are completed.

- A) COC-impacted soils are removed, transported and disposed off-site at a permitted, Subtitle D landfill facility.
- B) Analysis of confirmation samples collected from the excavation areas show that the remaining soils at the site meet the RAOs listed in H1 of **Table 1**.
- C) Excavated areas are backfilled as needed with compacted clean fill materials to match the surrounding area's grade.

- D) A long-term O&M plan is developed by Franklin Steel that includes the annual inspection and maintenance of the existing concrete covered areas in COC-impacted soil areas, and the plan is approved by Ohio EPA.
- E) The institutional controls to restrict the future land use to industrial/commercial purposes are established by an environmental covenant both approved and signed by Ohio EPA, and recorded in the same manner as the deed by the property owner with the Franklin County Recorder's Office in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to § 5301.92.
- F) Ohio EPA is notified that the environmental covenant has been recorded on the property in accordance with ORC § 5301.80 to § 5301.92.

This remedial alternative fulfills the two threshold criteria: protecting human health and the environment by preventing direct contact and/or ingestion of soil, and complying with all applicable federal and state regulations by disposing of soil that meets landfill acceptance criteria in a permitted, Subtitle D landfill and establishing an institutional control in accordance with the requirements specified in the ORC.

5.2 Sediment Excavation – Sediment Alternative #3 Sediment Removal of Five Target Reaches

The selected remedial alternative for ecoCOC-impacted sediment is the removal of the sediment in the five target reaches where concentrations exceeding the RAOs listed in **Table 1 Remedial Action Objectives Summary, Sediments – Ecological Receptors (E1)** have been identified in Unzinger Ditch as shown in **Figure 5**. Under Sediment Alternative #3, an average of 12 inches of sediment will be excavated from the five target reaches in the stream that are located below the storm water holding ponds 15-inch storm water outfall to Unzinger Ditch down to its confluence at Blacklick Creek.

The sediment removal operation involves clearing vegetation; excavating sediment and dewatering as necessary; transporting sediment for disposal at an approved landfill; and stream restoration (vegetation and landscaping) to minimize erosion. Excavated areas may need to be backfilled with compacted fill materials, such as clay, gravel and top soil to match the surrounding grade. The extent of the stream's sediment removal will be based on the following stream characteristics: confirmation sampling, visual observation, and/or the absence of appreciable sediment in the stream's channel. Franklin Steel will be required to obtain permit from both the U.S. Army Corps of Engineers and the Ohio EPA DSW before performing the sediment removal activities in Unzinger Ditch.

One of the goals in removing the contaminated sediments is to return the lower section of Unzinger Ditch to full attainment of Ohio EPA's water quality chemical-specific and biological criteria. In addition, compliance by the operating facility with its existing NPDES permit and improvements to the management and treatment of storm water required under the 2005 consent order with Container Recyclers, Inc. d.b.a. Columbus Steel Drum Company will further improve water quality in Unzinger Ditch. Completion

of the storm water ponds improvements prior to the sediment removal operation would be preferred.

Performance Standards: Ohio EPA will consider the contaminated sediment removal operation successful when the following items are completed.

- A) Excavated ecoCOC-impacted sediments are dewatered, transported and disposed off-site at a permitted, Subtitle D landfill facility.
- B) Analysis of confirmation samples collected from the excavation areas show that the remaining sediments in the stream meet the RAOs listed in E1 of **Table 1**.
- C) The excavated areas are backfilled as needed with compacted clean fill materials to match the surrounding area's existing grade.
- D) Restoration activities (vegetation and landscaping), which are to begin immediately after the completion of the sediment backfilling to minimize stream erosion, are completed.

This remedial alternative fulfills the two threshold criteria: protecting human health and the environment by preventing direct contact and/or ingestion of sediment by wildlife and trespassers, and complying with all applicable federal and state regulations by disposing of sediment that meets landfill acceptance criteria in a permitted, Subtitle D landfill and restoring the stream under the terms/requirements of the permits from the U.S. Army Corps of Engineers and the Ohio EPA DSW.

5.3 Monitored Natural Attenuation - Ground Water Alternative #2 Monitored Natural Attenuation with Institutional Controls

The selected remedial alternative for COC-impacted ground water is monitored natural attenuation with an institutional control. This alternative consists of a minimum two-year compliance monitoring program of the upper and lower ground water zones followed by a three-year detection monitoring program of both ground water zones; an institutional control prohibiting the installation of potable water wells; and a contingent remedy that will be implemented if the natural attenuation process is determined to be ineffective by a trend analysis of the compliance monitoring period's ground water sampling results.

As part of the O&M plan for the site, an enhanced ground water monitoring plan will be developed that consists of a two-year period of compliance monitoring followed by a three-year period of detection monitoring that will begin after the completion of the COC-impacted soil removal activities in the 18-acre active operations area.

In the two-year compliance monitoring period, ground water samples will be collected semi-annually from eight monitoring wells, S108-MW05, S108-MW06D, S109-PZ01, S109-PZ02, S109-MW05D, S109-MW06, S109-MW07 and S201-MW02 as shown by **Figure 3**. The ground water samples will be analyzed for metals, SVOCs, VOCs, and natural attenuation indication parameters as detailed in **Table 5 Summary of Decision Document's Ground Water Monitoring**. Statistical trend analysis of the data results

using all of the sampling events (i.e., all of the sampling events from 1997 to the present) may need to be performed to evaluate the effectiveness of the natural attenuation process in achieving the RAOs in the upper ground water zone as listed in **Table 1 Remedial Action Objectives Summary, Upper Ground Water Zone – Human Receptors (H2)**. Ground water flow and contaminant fate and transport modeling may also need to be performed to estimate the rate and extent of migration of the COCs from the site.

If RAOs are met for all COCs at the end of the two-year compliance monitoring period, then three years of detection monitoring will be conducted to verify that natural attenuation is occurring and RAOs continue to be met. The detection monitoring will collect ground water samples semi-annually from eight monitoring wells, S108-MW05, S108-MW06D, S109-MW05D, S109-MW06, S201-PZ01, S201-MW02, JTMW-2D, and JTMW-3D. The detection monitoring samples will be analyzed for SVOCs, VOCs and natural attenuation parameters as detailed in **Table 5**. Statistical trend analysis and ground water modeling of the data results from all of the sampling events may need to be conducted to verify that COC concentrations are decreasing over time.

TABLE 5: Summary of Decision Document’s Ground Water Monitoring

	Compliance Period	Compliance Period	Detection Period	Detection Period	Detection Period
Monitoring Well Location	YEAR 1 Analysis	YEAR 2 Analysis	YEAR 3 Analysis	YEAR 4 Analysis	YEAR 5 Analysis
S108-MW05	Metals, SVOCs, VOCs, Nat	Metals, SVOCs, VOCs, Nat	VOCs, Nat	VOCs, Nat	VOCs, Nat
S108-MW06D	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs
S109-PZ01	Metals, SVOCs, VOCs, Nat	Metals, SVOCs, VOCs, Nat	N/S	N/S	N/S
S109-PZ02	Metals, SVOCs, VOCs, Nat	Metals, SVOCs, VOCs, Nat	N/S	N/S	N/S
S109-MW05D	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs

S109-MW06	Metals, SVOCs, VOCs, Nat	Metals, SVOCs, VOCs, Nat	VOCs, Nat	VOCs, Nat	VOCs, Nat
S109-MW07	Metals, SVOCs, VOCs, Nat	Metals, SVOCs, VOCs, Nat	N/S	N/S	N/S
S201-PZ01	N/S	N/S	SVOCs	SVOCs	SVOCs
S201-MW02	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
JTMW-2D	N/S	N/S	SVOCs	SVOCs	SVOCs
JTMW-3D	N/S	N/S	SVOCs	SVOCs	SVOCs

- NOTES =
- 1) Semi-annual sampling events for each year.
 - 2) Metals = Target Analyte List metals.
 - 3) SVOCs = Target Compound List semi-volatile organic compounds.
 - 4) VOCs = Target Compound List volatile organic compounds.
 - 5) Nat = natural attenuation parameters such as alkalinity, chlorides, dissolved oxygen and sulfates.
 - 6) N/S = not sampled.

If RAOs are not met for all COCs at the end of the two-year compliance period, but the COC levels are stable or decreasing as shown by the statistical trend analysis, then the compliance monitoring period will continue until the RAOs are met in the upper ground water zone followed by the detection monitoring period. However, if the COC levels are increasing as shown by the statistical trend analysis, then a contingent remedy will be selected and developed by Franklin Steel. The contingent remedy will require the evaluation and selection of an active remediation system to reduce the levels of COCs. The active remediation option employed can be the extraction of COC-impacted groundwater followed by *ex situ* treatment and discharge of the treated water as outlined in Ground Water Alternative #3 of Section 3.3.3 or an equivalent system to address the specific COCs in the ground water.

As part of the O&M plan, a ground water monitoring program will be developed by Franklin Steel which will include, but not be limited to, the activities performed for the compliance and detection monitoring as described above.

An institutional control will prohibit the use of ground water for potable water purposes by the establishment of an environmental covenant on the property.

Performance Standard: Ohio EPA will consider the monitored natural attenuation successful when the following items are completed.

- A) It is demonstrated via periodic ground water monitoring that the natural attenuation process in the ground water is decreasing the levels of COCs, and that the RAOs listed in H2 of **Table 1** are achieved by the end of the five-year monitoring period.
- B) The institutional controls to prohibit the use of the area's ground water for potable water purposes are established by an environmental covenant both approved and signed by Ohio EPA, and recorded in the same manner as a deed by the property owner with the Franklin County Recorder's Office in accordance with the Ohio Uniform Environmental Covenants Act, ORC § 5301.80 to § 5301.92.
- C) Ohio EPA is notified that the environmental covenant has been recorded on the property in accordance with ORC § 5301.80 to § 5301.92.

This remedial alternative fulfills the two threshold criteria: protecting human health and the environment by preventing direct contact and/or ingestion of ground water, and complying with all applicable federal and state regulations by establishing that the ground water meets the drinking water MCLs.

6.0 DOCUMENTATION OF SIGNIFICANT CHANGES

Ohio EPA received three separate sets of comments during the public meeting and public comment period. Based on Ohio EPA's consideration of these comments, a number of changes were made to the selected remedial alternative's ground water monitoring remedy presented in Ohio EPA's February 25, 2010 Preferred Plan to address these received comments.

Compliance Period Monitoring Changes:

Deleted two shallow Monitoring Wells S101-MW01R and S107-MW02, and added four monitoring wells, S108-MW05, S108-MW06D (deep well), S109-PZ01 and S109-MW05D (deep well), to the Decision Document's ground water monitoring network for a total of eight monitoring wells.

Analysis for metals and natural attenuation parameters will be performed in five of the shallow monitoring wells; S108-MW05, S109-PZ01, S109-PZ02, S109-MW06 and S109-MW07. Analysis for SVOCs will be performed in all eight monitoring wells and analysis for VOCs will be performed in all the monitoring wells except for Monitoring Well S201-MW02.

Detection Period Monitoring Changes:

Deleted four shallow monitoring wells, S101-MW01R, S107-MW02, S109-PZ02 and S109-MW07, and added six Monitoring Wells S108-MW05, S108-MW06D, S109-MW05D, S201-PZ01, JTMW-2D (deep well) and JTMW-3D (deep well) for this period's ground water monitoring network for a total of eight monitoring wells.

Analysis for natural attenuation parameters will be performed only in Monitoring Wells S108-MW05 and S109-MW06. Analysis for VOCs will be performed only in four monitoring wells, S108-MW05, S108-MW06D, S109-MW05D and S109-MW06. Analysis for SVOCs will be performed in six monitoring wells, S108-MW06D, S109-MW05D, S201-PZ01, S201-MW02, JTMW-2D and JTMW-3D.

7.0 RESPONSIVENESS SUMMARY

Ohio EPA received comments from interested parties during the public comment period which ended on April 23, 2010, and at the public meeting held at Gahanna Lincoln High School in Gahanna, Ohio on April 14, 2010. The Franklin Steel Company and Jefferson Township Water and Sewer District submitted written comments on the Preferred Plan's ground water monitoring remedy. The city of Gahanna submitted written comments on the plan's clean-up oversight, schedule and extent of the site being remediated. These comments and Ohio EPA's responses are summarized below.

Comments from Franklin Steel:

On March 19, 2010, Ohio EPA's DERR, Central District Office, received electronically from Franklin Steel's consultant, RMT, written comments on the Ohio EPA – Preferred Plan for the Franklin Steel site. The comments are as follows:

"The following language is proposed to replace paragraphs 3, 4 and 5 of Sections 7.3.2 and 9.3 in Ohio EPA's Preferred Plan:

During the two-year compliance period, ground water samples would be collected semi-annually from six wells for specific chemicals of concern (COCs) as follows:

S107-MW-02 – arsenic

S101-MW01R – arsenic

S109-MW06 – VOCs, SVOCs, arsenic, natural attenuation parameters

S109-PZ02 – VOCs

S109-PW07 – VOCs

S201-MW02 – SVOCs

The natural attenuation indication parameters would signify biological activity in the ground water is occurring, and these parameters include alkalinity, chlorides, dissolved oxygen, and sulfates. Statistical trend analysis of the sampling data results may be performed to evaluate any trends in the concentrations of COCs over time. Ground water flow and contaminant fate and transport modeling may also be performed to estimate the rate and extent of migration of the COCs from the site.

If RAOs are met for all COCs specific to each monitoring well at the end of the two-year compliance period, then three years of detection monitoring would be conducted to verify that natural attenuation is occurring and RAOs continue to be met. For the 3-year detection monitoring period, samples would be collected semi-annually and analyzed for VOCs from the following wells: S109-MW06, S101-MW07, and S109-PZ02. After the 5-year period, the monitoring program would be completed.

If RAOs are not met for all COCs at the end of the 2-year compliance period, then three years of detection monitoring would also be conducted as stated above. If after the 5-year period, COCs have not reached S109-MW07 or S109-PZ02 above the RAOs, the monitoring program will be completed. However, if the concentrations of COCs in either S109-MW07 or S109-PZ02 are above the RAOs during the monitoring period, then Franklin Steel would need to develop a contingent active remedy.”

Ohio EPA Response:

Before responding with specific comments, Ohio EPA notes that the Preferred Plan’s ground water proposed remedy was closely based on the monitored natural attenuation alternative proposed by Franklin Steel in the approved CMS document. Refer to the **Table 6 Compliance Monitoring Period Comparisons of Ground Water Alternatives** and **Table 7 Detection Monitoring Period Comparisons of Ground Water Alternatives** which summarize and compare the ground water monitoring alternatives of the CMS, Preferred Plan and Franklin Steel’s March 19, 2010 plan review comments.

TABLE 6: Compliance Monitoring Period Comparisons of Ground Water Alternatives

	Corrective Measures Study (Franklin Steel)	Preferred Plan (Ohio EPA)	Franklin Steel March 19 Response
Monitoring Wells	Six shallow wells	Six shallow wells	Six shallow wells
Parameter Analysis	Metals, PAHs, VOCs for all six wells	Metals, SVOCs, VOCs for all six wells	S107-MW02 - arsenic S101-MW01R- arsenic S109-MW06 - VOCs, SVOCs, arsenic S109-PZ02 - VOCs S109-MW07 - VOCs S201-MW02 – SVOCs
Natural Attenuation Analysis	Area of Monitoring Well S109-MW06	All six wells	S109-MW06 only
Number of Sampling Events	Four quarterly	Four semi-annual	Four semi-annual
Duration of Period	One year	Two years	Two years

TABLE 7: Detection Monitoring Period Comparisons of Ground Water Alternatives

	Corrective Measures Study (Franklin Steel)	Preferred Plan (Ohio EPA)	Franklin Steel March 19 Response
Monitoring Wells	Six shallow wells	Six shallow wells	Three shallow wells
Parameter Analysis	VOCs for all six wells	VOCs for all six wells	S109-MW06 - VOCs S109-PZ02 - VOCs S109-MW07 - VOCs
Natural Attenuation Analysis	Area of Monitoring Well S109-MW06	All six wells	None
Number of Sampling Events	Four quarterly	Six semi-annual (<i>two added by Ohio EPA</i>)	Six semi-annual
Duration of Period	One year	Three years	Three years
Contingent Remedy [<i>Well S109-MW06 has consistent detections of COCs over last eight sampling events</i>]	At the end of One-year detection period if exceed RAOs in area's monitoring wells	At the end of Two-year compliance period (<i>before start of detection period</i>) if RAOs exceeded in any of the six wells	At end of Three-year detection period if exceed RAOs in either wells S109-MW07 or S109-PZ02 [<i>excludes S109-MW06</i>]

NOTE: The two tables summarize the ground water remediation alternatives presented in Franklin Steel's approved Corrective Measures Study, Ohio EPA's Preferred Plan and the March 19, 2010 response from Franklin Steel's review of the Preferred Plan. The italicized parts are comments made by Ohio EPA.

In response to the first paragraph in Franklin Steel's March 19, 2010 comment letter, Ohio EPA does not agree to limit the ground water sampling analysis during the two-year compliance period to the proposed specific COCs. The goal of the two-year compliance period monitoring is to confirm that the ground water has not been affected by the 18-acre operations area's contaminated soil removal actions. Therefore, all of the ground water monitoring samples will be analyzed for metals, VOCs and SVOCs during the compliance period, except that the analysis for metals will not be performed in Monitoring Wells S108-MW06D, S109-MW05D, S201-PZ01 and S201-MW02. However, the analysis for natural attenuation parameters analysis will be performed in only four shallow monitoring wells, S108-MW05, S109-PZ01, S109-MW06 and S109-MW07.

In response to the second paragraph, Ohio EPA agrees to the conditional language "may be" proposed for the statistical trend analysis, ground water flow, and contaminant fate and transport modeling. Further evaluation of the ground water conditions will have to be performed if the compliance period monitoring indicates levels of COCs above the RAOs that require the development of a contingent remedy to address these COCs.

In response to the third paragraph's first sentence, Ohio EPA does not agree to have each monitoring well's sampling results meet the RAOs for only specific COCs at the end of the compliance period monitoring. To confirm the cleanup of the ground water, all monitoring wells must meet the RAOs for any and all COCs at the end of the two-year compliance period. If the RAOs are not met in the ground water, then a contingent remedy must be developed for those COC(s) still above the RAOs.

In response to the third paragraph's second sentence, Ohio EPA does not agree to do less ground water monitoring during the detection period by only sampling three wells instead of the Preferred Plan's original language to perform sampling of all the monitoring wells. The goal of the detection period is to confirm that natural attenuation continues to occur and the RAOs continue to be met in the ground water.

In response to the third paragraph's last sentence, Ohio EPA does not agree to place a five-year timeframe for the completion of the ground water monitoring program. Instead, the completion of the monitoring program will depend on meeting the RAOs for all COCs in the ground water by either the detection period monitoring or employing a contingent remedy.

In response to the comment's last paragraph, Ohio EPA does not agree to begin three years of detection monitoring if the RAOs are not met for all COCs at the end of the two-year compliance period monitoring. Likewise in response to the paragraph's second sentence, Ohio EPA does not agree to end the ground water monitoring program after five years (two years of compliance and three years of detection monitoring) if no RAOs are detected above the COCs in Monitoring Wells S109-MW07 or S109-PZ02. As stated in the Preferred Plan's original language, the RAOs must be met for all of the COCs in all of the monitoring wells, including Monitoring Well S109-MW06, to verify completion of the clean-up remedy for ground water. In addition, Ohio EPA does not agree to use only Monitoring Wells S109-MW07 or S109-PZ02 as the indicator to develop a contingent active ground water remedy. All the monitoring wells (including S109-MW06) will be included in the evaluation of the need for, and development of, a contingent remedy.

Comments from Jefferson Township Water and Sewer District:

On April 23, 2010, Ohio EPA's DERR, Central District Office, received electronically from Jefferson Township Water and Sewer District's (Jefferson Township) consultant, Eagon and Associates, written comments on the Ohio EPA – Preferred Plan for the Franklin Steel site. The comments are as follows:

- *"It is requested that Jefferson Township wells MW-1S, MW-1D, MW-3S and MW-3D be included in the monitoring network.*
- *It is requested that Franklin Steel monitoring well S201-PZ01 remain in the network.*

- *It is requested that at least two additional deep monitoring wells be installed and monitored as part of the network. If significant contamination is identified in the deeper aquifer, additional wells should be installed, as necessary, to characterize the full extent of contamination in the aquifer.*
- *The Preferred Plan should include PRGs for recently detected parameters that are not currently included, if appropriate.*
- *The Preferred Plan should ensure reduction in COC levels in both the upper ground-water zone and lower ground-water zone if it is determined that COCs are present in the deeper aquifer before monitoring can cease.”*

Ohio EPA Response:

The potential contamination from the Franklin Steel site migrating to Jefferson Township Public Water Supply Wells WSW-1, WSW-2 and WSW-3 also concerns Ohio EPA. The ground water investigation has determined that the three public water supply wells are downgradient, approximately 2,600 feet to 3,200 feet northeast of the 18-acre active operations area and its areas of contaminated soils. As shown by Eagon's Figure 1, part of the impacted soils area is located within the ground water's five-year time of travel (TOT) zone determined for the three public water supply wells. Franklin Steel has been collecting ground water samples for the last 12 years (since May 1997) in 19 monitoring wells with detections of various COCs above the RAOs. However, none of these COCs have been detected above the drinking water MCLs in the Jefferson Township public water supply wells.

In response to the first bullet item, Ohio EPA does not agree to add the Jefferson Township Monitoring Wells JTMW-1S, JTMW-1D, JTMW-3S and JTMW-3D to the Decision Document's ground water monitoring network. These four monitoring wells are located within the one-year TOT zone of the three public water supply wells, too close to the supply wells to provide an adequate early warning of contamination. In addition, a review of the 22 sampling events performed from March 1998 - October 2009 found only one detection in March 1998 in Monitoring Well JTMW-3D and one detection in March 1999 in Monitoring Well JTMW-1S above the drinking water MCLs for bis(2-ethylhexyl)phthalate. Instead, Ohio EPA will include Monitoring Wells S108-MW05 and S109-PZ01, which are the closest wells downgradient to, but not in, the impacted soils area of the 18-acre operations area, in the Decision Document's ground water monitoring network.

In response to the second bullet item, Ohio EPA does agree to include Monitoring Well S201-PZ01 in the Decision Document's ground water monitoring network.

In response to the third bullet item, Ohio EPA does not agree to require the installation of two new additional deep monitoring wells for the Decision Document's ground water monitoring network. The two existing deep monitoring wells, S108-MW06D and S109-

MW05D, have screen elevation intervals sufficient to monitor the aquifer layer used by the Jefferson Township public water supply wells as detailed in Eagon's Table 4. In addition, the two existing wells are located immediately (250 - 300 feet) downgradient of the contaminated soil removal actions in the 18-acre operations area. Therefore, Ohio EPA will include the existing deep Monitoring Wells S108-MW06D and S109-MW05D in the Decision Document's ground water monitoring network.

In response to the third bullet item's second sentence, Ohio EPA does not agree that the site investigation's ground water sampling results indicate significant contamination in the deep aquifer system. The deep monitoring wells adjacent to the areas of impacted soils areas, S108-MW06D and S109-MW05D, had 13 sampling events from May 1997 - June 2000 with only one detection of bis(2-ethylhexyl)phthalate in Monitoring Well S109-MW05D above the drinking water MCL. Also, the three semi-annual sampling events starting in October 2008 did not find any COCs above their MCL in Monitoring Well S109-MW05D. The two deep monitoring wells adjacent to Jefferson Township public water supply wells, JTMW-1D and JTMW-3D, had ten sampling events from March 1998 - June 2000 with only one detection of bis(2-ethylhexyl)phthalate above the drinking water MCL.

In response to the fourth bullet item, Ohio EPA does not agree to add U.S. EPA Region PRGs for the recently detected SVOC and PAHs parameters shown in Eagon's Table 3 to the RAOs listed in **Table 1 Remedial Action Objectives Summary** of the Decision Document. The SVOC and PAH concentrations listed in Eagon's Table 3 do not have any established drinking water MCLs, and these concentrations were below the U.S. EPA Region 9 PRGs for tap water. Franklin Steel's risk exposure assessment of the ground water sampling results evaluated these SVOC and PAH parameters, but because the detections were below the MCLs and PRGs, they were not included in the RAOs listed in the Preferred Plan.

In response to the fifth bullet item, Ohio EPA does agree to provide in the Decision Document that meeting the RAOs for all the COCs in ground water will also include the lower aquifer zone by the evaluation of the sampling results from the deep monitoring wells. Dependent on the sampling results, a contingent remedy may have to be developed to address the ground water contamination in the lower aquifer zone.

Comments from the City of Gahanna:

On April 23, 2010, Ohio EPA's DERR, Central District Office, received electronically from the city of Gahanna's Planning and Zoning Administrator, written comments on the Ohio EPA - Preferred Plan for the Franklin Steel site. The comments are as follows:

- *"How will the Ohio EPA ensure that the plan is carried out?"*
- *What is the proposed time frame?*

- *Will the clean-up be funded by some sort of grant or is Columbus Steel Drum (CSD) totally financially responsible?*
- *By what means will the site be monitored and who will enforce the environmental covenant to limit site activity and ground water use?*
- *Will the ground area where the approximately 55,000 drums are currently stored be monitored as well as the area used to store the additional 11,000 drums inside numerous semi-trailers?*
- *Can contaminants leach through, or around, the existing concreted areas, and if so, how will this be addressed?*
- *Can Ohio EPA require CSD to provide a less permeable exterior area such as asphalt or concrete?*
- *Could the two 10-acre inactive sites still be leaching contaminants to surrounding soil and water? Are they included in the clean-up plan?"*

Ohio EPA Response:

In response to the first bullet item, Franklin Steel will be required to implement remedial design/remedial action (RD/RA) activities, as required in a final consent decree filed in federal court. This final consent decree is a binding, legal document between the State of Ohio and Franklin Steel that requires performance of the work outlined in the Decision Document's selected remedial alternative issued by the Director of Ohio EPA. The final consent decree will also require the establishment of a financial assurance mechanism to ensure Franklin Steel's ability to complete the required RD/RA activities, and the recording of an environmental covenant on the property's deed to restrict future land and ground water use.

In response to the second bullet item, Ohio EPA is not certain about the exact time frame required to complete the required RD/RA activities. A more exact work schedule will be provided as part of the work plan required by the RD/RA consent decree. Once started, Ohio EPA estimates that the soil removal operation will take one to three months, the off-property sediment removal operation will take two to four months, and the ground water monitoring program will be performed for a minimum of five years after the contaminated soil removal operation is completed.

In response to the third bullet item, the cleanup of the site's contamination will be funded solely by the Franklin Steel Company, the original owner/operator of the drum reconditioning facility at 1385 Blatt Boulevard. In December 2007, Franklin Steel sold this property to Columbus QCB, Inc. However, the drum reconditioning business is being operated by Industrial Container Services who is doing business as Columbus Steel Drum Company.

In response to the fourth bullet item, Ohio EPA staff will be on-site to observe the soil removal operation, the sediment removal and stream restoration activities, and the collection of the ground water monitoring samples. Franklin Steel will have to submit summary reports of its soil, sediment and ground water sample results to Ohio EPA for review and approval. A five-year review will be conducted by Ohio EPA to evaluate the effectiveness of the clean-up actions and to observe the current site conditions. The environmental covenant to restrict future site activities will be enforced by Ohio EPA.

In response to the fifth bullet item, the numerous used drums being stored on the ground and inside semi-trailers at the used drum reconditioning facility are part of the current drum reconditioning facility operations and will not be addressed under the RD/RA consent decree. Ohio EPA's Divisions of Air Pollution Control, Hazardous Waste Management and Surface Water oversee the various activities associated with the current drum reconditioning operation under each division's specific regulatory authority.

In response to the sixth bullet item, the contaminants are not expected to leach through the existing concrete areas that are part of the drum conveyor system and building pads if the facility employees continue to practice good housekeeping activities to minimize spillage from drums and to remove ash residue materials from the conveyor system. The impacted soils will be removed up to the edge of the concrete areas to minimize the areas of contamination, and the ground water will be monitored for a minimum of five years to confirm that any remaining contaminants are not migrating from the site.

In regard to the seventh bullet item, Ohio EPA will not agree to require Franklin Steel to increase the areas of asphalt or concrete over the used drum reconditioning facility's existing gravel areas. The remedial alternative selected by Ohio EPA will remove the impacted soils from the site and maintain the existing extent of the gravel areas. The current owner, Columbus QCB, could increase the impervious surface areas at the site, but this would significantly increase the amount of storm water runoff being discharged from the site into Blacklick Creek.

In response to the eighth bullet item, Franklin Steel's investigation of the two 10-acre former drum storage areas did not find any COC concentration above the residential exposure risk levels. Therefore, these two former drum storage areas were not included in the clean-up remedy plan because the COC concentrations were below any level that required further action.

8.0 GLOSSARY

Aquifer -	An underground geological formation capable of holding and yielding water.
ARARs -	Applicable or relevant and appropriate requirements. Those statutes and rules, which strictly apply to remedial activities at the site, or those statutes and rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment -	An evaluation of the risks to humans and the environment posed by a site.
Bis(2-ethylhexyl)phthalate -	A manufactured chemical that is commonly added to plastics to make them flexible. The U.S. EPA has determined that this chemical is a probable human carcinogen.
Carcinogen -	A chemical that causes cancer.
CERCLA -	Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Chloroethane -	A common industrial chemical used in the production of dyes, solvents and refrigerants. Often formed by the breakdown of other chlorinated chemical compounds such as vinyl chloride in the ground water.
Contaminants of Concern (COCs) -	Chemicals identified at the site which are present in concentrations that may be harmful to human health or the environment.
Corrective Measures Study (CMS) -	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.

- Decision Document - A statement issued by the Ohio EPA giving the Director's selected remedy for a site and the reasons for its selection.
- 1,1-dichloroethane - A common industrial chlorinated chemical that is colorless with a sharp, harsh odor. Often formed by the breakdown of other chlorinated chemical compounds in ground water.
- Ecological Receptor - Animals or plant life exposed or potentially exposed to chemicals released from a site.
- EE/CA - Engineering Evaluation/Cost Assessment. A report issued under the U.S. EPA's Superfund Accelerated Cleanup Model that evaluates remedies for a site and estimates their costs. EE/CAs are generally shorter and include fewer alternatives than Feasibility Studies.
- Environmental Covenant - A servitude arising under an environmental response project that imposes activity and use limitations on real property in accordance with the requirements established in section 5301.82 of the Ohio Revised Code.
- Exposure Pathway - Route by which a chemical is transported from the site to a human or ecological receptor
- Final Cleanup Levels - Final cleanup levels are identified in the Decision Document along with the RAOs and performance standards.
- Hazardous Substance - A chemical that may cause harm to humans or the environment.
- Hazardous Waste - A waste product, listed or defined by the RCRA, which may cause harm to humans or the environment.
- Human Receptor - A person or population exposed to chemicals released from a site.
- LOE Contractor - Level of Effort Contractor. A person or organization retained by the Ohio EPA to assist in the investigation, evaluation or remediation of a site.
- Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in a public drinking water supply. The level is established by U.S. EPA and incorporated into OAC 3745-81-11 and 3745-81-12.

NCP -	National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended. A framework for remediation of hazardous substance sites under CERCLA.
O&M -	Operation and Maintenance. Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
PAHs -	Polycyclic aromatic hydrocarbons. Class of semi-volatile chemicals including multiple six-carbon rings. Often found as residue from coal-based chemical processes.
PCBs -	Polychlorinated biphenyls. An oily chemical typically used in electrical equipment.
PCE -	Tetrachloroethene or Perchloroethylene. A common industrial solvent and cleaner, often used for dry cleaning.
Performance Standard -	Measures by which Ohio EPA can determine if RAOs have been met.
Preferred Plan -	The plan that evaluates the remedial alternatives identified in the Corrective Measures Study and explains the preferred remedial alternative chosen by Ohio EPA to remediate the site in a manner that best satisfies the evaluation criteria.
Preliminary Remediation Goal (PRG) -	Initial clean-up goals that (1) are protective of human health and the environment and (2) comply with ARARs. They are developed early in the process (scoping) based on readily available information and are modified to reflect the results of the baseline risk assessment (termed site-specific PRGs at this point in time). They are also used during the analysis of remedial alternatives in the remedial investigation/feasibility study (RI/FS).
RCRA -	Resource Conservation and Recovery Act of 1976 codified at 42 U.S.C. 6901 et seq. (1988), as amended. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives (RAOs) -	Specific goals of the remedy for reducing risks posed by the site.

RCRA Facility Investigation (RFI) -	A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.
Responsiveness Summary-	A summary of all public comments received concerning the Preferred Plan and Ohio EPA's response to each of those comments.
Vinyl Chloride -	A manufactured chemical used to make polyvinyl chloride. Often formed by the breakdown of other chlorinated chemical compounds such as PCE or TCE in ground water.
Water Quality Criteria -	Chemical, physical and biological standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source. These standards can be found in Chapter 3745-1 of the Ohio Administrative Code.
TCA -	1,1,1-Trichloroethane. A common industrial solvent and cleaner.
TCE -	Trichloroethylene. A common industrial solvent and cleaner.

FIGURE 1

Site Location (United States Geological Survey)

(from RMT's June 2009 Corrective Measures Study – Figure 1.1)

NAME: FIG 2.1-R\CSD\001369\LOCATION.DWG DATE: JUN 25, 2001 TIME: 9:27 AM CTB: S\ACTB PLOTTING\MONochrome.CTB

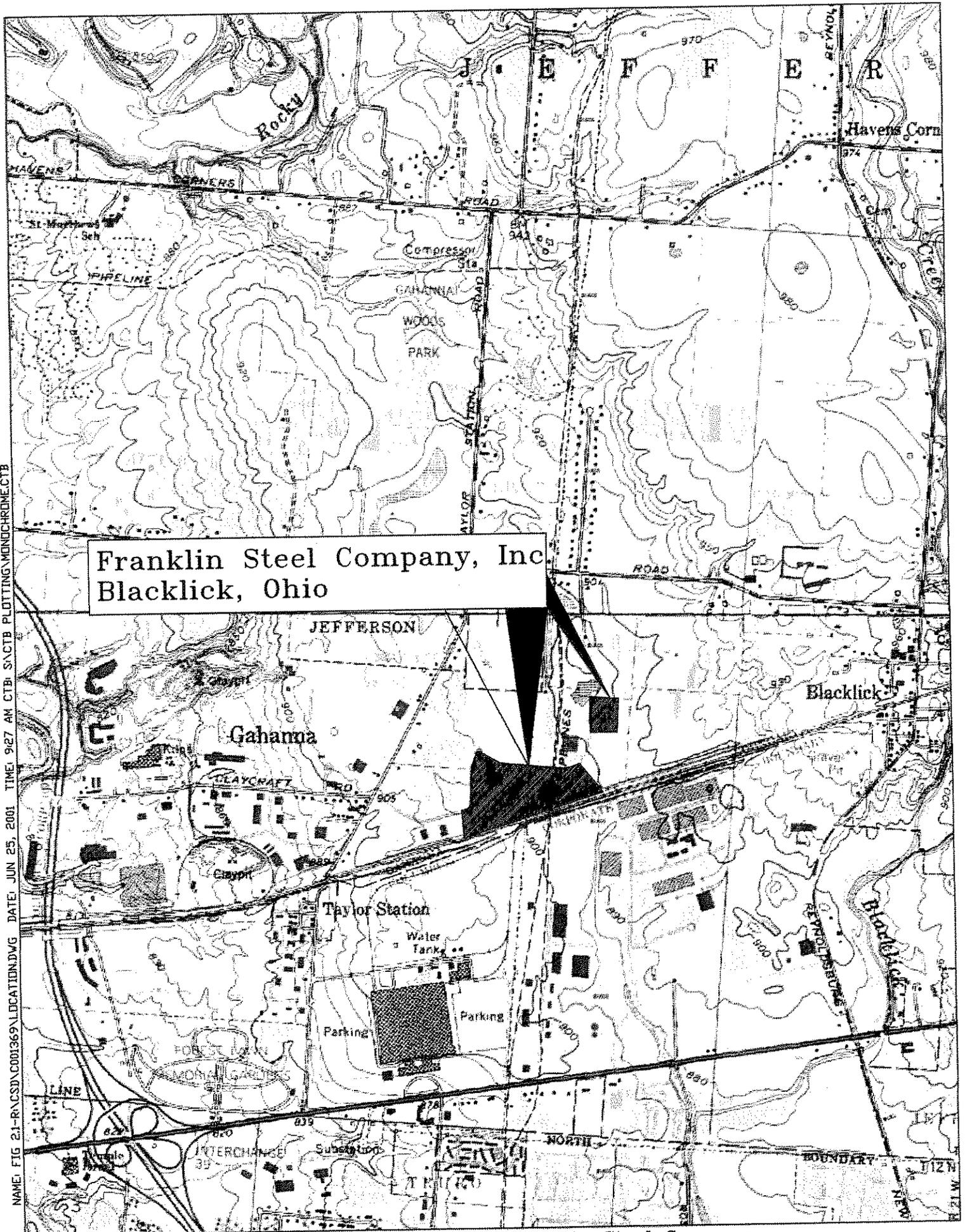


Figure 1.1 Location Map For Franklin Steel Company

FIGURE 2

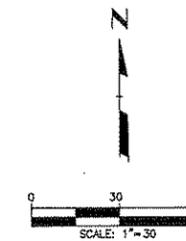
Solid Waste Management Units and Identified Areas of Concern

(from RMT's June 2009 Corrective Measures Study – Figure 2.9B)



- AREAS CURRENTLY UNDER CONCRETE CAP
- AREAS NOT CURRENTLY UNDER CONCRETE CAP
- SURFACE WATER LOCATION
- SEDIMENT SAMPLE LOCATION
- SOIL SAMPLE LOCATION
- HAND AUGER LOCATION
- 1988 OHIO REMEDIAL/REMOVAL ACTIVITIES BACKGROUND SOIL SAMPLE LOCATIONS
- EXISTING MONITORING WELL
- EXISTING PIEZOMETER
- EXISTING PIEZOMETER (NOT USED)

NOTES: 1. SHADED RESULTS EXCEED THE REMEDIAL ACTION OBJECTIVES FOR SOIL
 2. HHRA—HUMAN HEALTH RISK ASSESSMENT
 3. RAOs—REMEDIAL ACTION OBJECTIVES

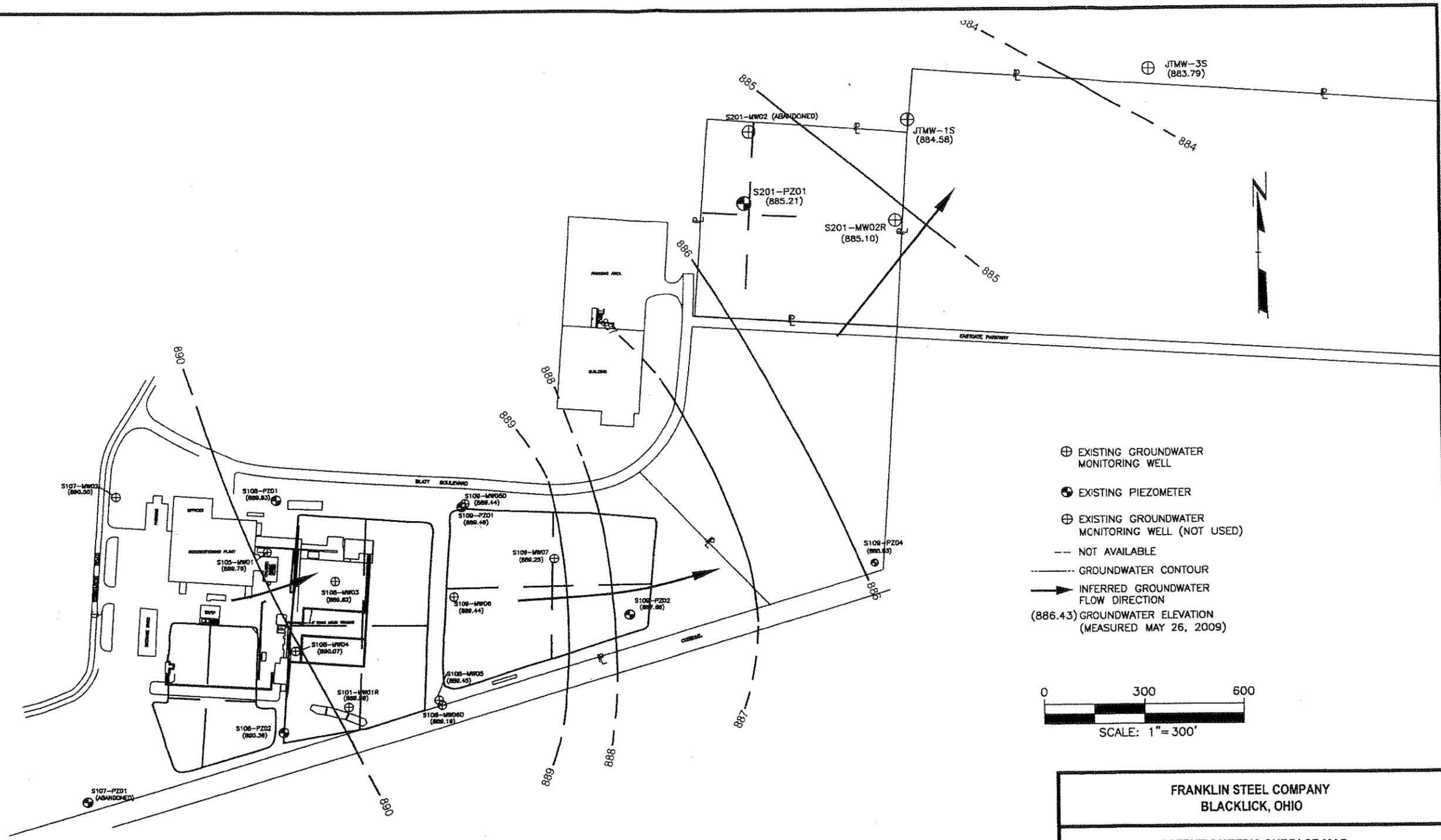


5.					
4.					
3.					
2.					
1.					
NO.	BY	DATE	REVISION	APP.	
FRANKLIN STEEL COMPANY BLACKLICK, OH					
FIGURE 2.9 EXPOSURE UNIT 1 (AREAS OF REMEDIATION)					
DRAWN BY:	CR	DRAWING SCALE:	AS SHOWN	PROJECT:	2.05771516MS REPO
CHECKED BY:	TL	DATE PRINTED:	December 2009	FILE NO.:	Figure 2.9(a)
APPROVED BY:	TL				FIGURE 2.9
DATE:	December 2009				

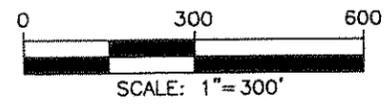
FIGURE 3

Location of Ground Water Monitoring Wells and Piezometers

(from RMT's May 2009 Ground Water Summary Report's Figure 1)



- ⊕ EXISTING GROUNDWATER MONITORING WELL
- ⊕ EXISTING PIEZOMETER
- ⊕ EXISTING GROUNDWATER MONITORING WELL (NOT USED)
- NOT AVAILABLE
- GROUNDWATER CONTOUR
- ➔ INFERRED GROUNDWATER FLOW DIRECTION
- (886.43) GROUNDWATER ELEVATION (MEASURED MAY 26, 2009)



FRANKLIN STEEL COMPANY			
BLACKLICK, OHIO			
POTENTIOMETRIC SURFACE MAP			
MAY 2009			
DRAWN BY:	QR	PROJECT #	J\06771\POTENTIAL\MAY 2009
CHECKED BY:	ML	FILE NUMBER:	Potential52609.dwg
APPROVED BY:	ML	DATE:	August 2009
DRAWING SCALE:	SHOWN	FIGURE NO.	FIGURE 1
RMT		655 Metro Place South, Suite 750 Dublin, Ohio 43017-5306 Phone: 614-793-0028 • Fax: 614-793-0151	

FIGURE 4

Conceptual Site Model

(from RMT's June 2008 RCRA Facility Investigation Report's Figure 6.1)

Receptor Characterization

- ✓ Onsite Worker
- ✓ Constr./Utility Worker
- ✓ Trespasser
- ✓ Onsite Worker
- ✗ Constr./Utility Worker
- ✗ Trespasser
- ✗ Onsite Worker
- ✗ Constr./Utility Worker
- ✗ Trespasser
- ✓ Onsite Worker
- ✓ Constr./Utility Worker
- ✓ Trespasser

Exposure Pathways

- Ingestion
Inhalation^a
Dermal Contact
- Inhalation^b
- Ingestion^c
- Ingestion
Dermal Contact

Transport Mechanisms

- Wind Erosion and Atmosphere Dispersion
- Volatilization and Enclosed Space Accumulation
- Leaching and Groundwater Transport
- Stormwater/Surface Water Transport

Secondary Sources

- Surficial Soils (<2 feet)
- Subsurface Soils (>2 feet)
- Groundwater
- Sediment/Surface Water
- Utility/Sewer Conduit

Primary Sources

- Releases from on-site Drums
- Surface Releases During Operations
- Stormwater Water Runoff

- Potentially Direct Pathway
- - Potentially Indirect Pathway
- ✓ Denotes Potentially Complete Exposure.
- ✗ Denotes Potentially Incomplete Exposure.
- [a] Indicates Inhalation of Particulates (dust migration).
- [b] Indicates Vapor Intrusion into Enclosed Buildings Through Cracks in Foundations.
- [c] Indicates Potable use of Groundwater.

Figure 1 Conceptual Site Model For Franklin Steel Exposures



FIGURE 5

Unzinger Ditch Sediments with Elevated Concentrations

(from RMT's June 2009 Corrective Measures Study – Figure 2.10_revised)

APPENDIX A

Wednesday, April 14, 2010 Public Hearing Transcript on
Ohio EPA's February 2010 Preferred Plan

STATE OF OHIO
ENVIRONMENTAL PROTECTION AGENCY
Gahanna Lincoln High School
630 Hamilton Road
Gahanna, Ohio

Wednesday, April 14, 2010

6:30 P.M.

- - -

In the matter of:

Public Hearing to accept oral and
written comments regarding Franklin Steel

Appearances:

Jed Thorp

Ken Schultz

David O'Toole

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(740) 345-8556

1 official record for this hearing.

2 Written comments can be filed with me
3 tonight or submitted to David O'Toole, Site
4 Coordinator, Ohio EPA, Central District Office,
5 Post Office Box 1049, Columbus, Ohio 43216-1049.
6 This address can also be found on the agenda for
7 this hearing.

8 It is important for you to know that all
9 comments received in writing at the agency, all
10 written comments given to me tonight, and all
11 verbal comments given here tonight are given the
12 same consideration.

13 Questions and comments made at the
14 public hearing will be responded to in a document
15 known as the Response to Comments. The Director,
16 after taking into consideration the recommendations
17 of the program staff and comments presented by the
18 public, will make a final decision.

19 Once a final decision is made, the final
20 decision, along with the Response to Comments, will
21 be communicated to all persons who have submitted
22 comments and all persons who present testimony at
23 tonight's hearing.

24 Final actions of the Director are

1 appealable to the Environmental Review Appeals
2 Commission, ERAC. The Board is separate from the
3 Ohio EPA and reviews cases in accordance with
4 Ohio's environmental laws and rules.

5 Any ERAC decision is appealable to the
6 Franklin County Court of Appeals. Any order of the
7 Court of Appeals is appealable to the Supreme Court
8 of Ohio.

9 If you wish to present testimony at this
10 hearing tonight and have not already completed a
11 blue card, please do so at this time and return it
12 to me or an Ohio EPA representative. The cards are
13 available at the registration table.

14 Each individual may testify only once,
15 so I ask that you use your time wisely and that you
16 are respectful of others providing their comments
17 and questions. There is no cross-examination of
18 the speaker or Ohio EPA representatives in public
19 hearings of this type.

20 Ohio EPA's public hearings afford
21 citizens an opportunity to provide input.
22 Therefore, we will not be able to answer questions
23 during the hearing. The hearing officer or an Ohio
24 EPA representative may ask clarifying questions of

1 speakers to ensure that the record is as complete
2 and accurate as possible.

3 If you have a question, please phrase
4 your comments in the form of a question and the
5 agency will address your concerns in writing within
6 the response to comments.

7 Out of courtesy for elected officials
8 here tonight, I will request they make themselves
9 known to me at this time and I will give them the
10 opportunity to testify first. Are there any
11 elected officials here who would like to testify?

12 We will now receive testimony. As I
13 call your name, please come forward, state your
14 name, spell it for the record, and proceed with
15 your testimony.

16 The first person requesting to testify
17 is Chris Cobel. Chris.

18 MR. COBEL: I am Chris Cobel with Eagon
19 & Associates. We have concerns. Obviously, we
20 have a public water supply right next door to this
21 facility.

22 I noticed in the selected alternative
23 number two that there is going to be a covenant to
24 not use the groundwater, but the reality is that we

1 will continue to use the water that originates from
2 underneath that facility for years to come. The
3 capture area of our wells goes directly beneath the
4 facility.

5 There has been a lot of shallow
6 monitoring done at the facility over the years, and
7 we do not have a good feeling that the vertical
8 extent of contaminant migration has been adequately
9 identified.

10 We are going to put these comments into
11 writing before the 23rd, but we continue to see
12 detections of some volatile organic compounds,
13 PAHs, semi-volatile compounds, and we are concerned
14 over the long term if the selected alternative
15 results in the monitoring wells being able to be
16 abandoned and monitoring discontinued in a limited
17 amount of time, that is a big concern for the
18 district. So we are leaning toward asking to have
19 some additional deep monitoring wells put in.

20 Our wells are screened 75 to 90 feet
21 deep, and right now it is my understanding that
22 most of the monitoring is occurring in the shallow
23 aquifer. There are two aquifers out there, there
24 is a shallow aquifer and a deep aquifer. We want

1 some kind of confidence that the deep zone has been
2 adequately characterized.

3 In the selected alternative it states
4 that alternative number two will include monitoring
5 wells, those will need to be maintained for a
6 limited period of time. In my experience with the
7 site with this kind of contamination, that is not
8 adequate.

9 Hopefully, the selected remediation
10 alternatives with the soil removal and everything
11 will reduce the contaminants in the shallow zone,
12 but there again, I haven't seen anything that gives
13 us any good feeling that these things haven't
14 migrated deeper.

15 We continue to get detections of
16 compounds in our monitoring wells on the well field
17 property, both estimated and quantified detections.
18 So we would ask in addition to putting in a couple
19 wells between Franklin Steel and our well field,
20 that additional monitoring of the adjacent deep
21 wells at Jefferson Water and Sewer that are
22 currently being monitored by Franklin Steel,
23 namely, One-S and Three-S, with the adjacent deep
24 monitoring wells at those two locations, you can't

1 just put a list as being sampled for in the shallow
2 zone.

3 We would like to meet with the agency
4 potentially before the 23rd, if the 23rd is the
5 drop-dead date. We have more questions and, you
6 know, I understand we are not to be asking
7 questions here, but we have more questions that we
8 would like to have answered. Perhaps you could
9 provide time for a conference call or a
10 face-to-face meeting prior to when we would submit
11 our written comments to clear up a few things.
12 That is all I have.

13 MR. SCHULTZ: We will follow-up with
14 Chris and set up a meeting or a call. I just
15 checked with Dave, and we are both available the
16 16th and 19th, Friday or Monday.

17 MR. THORP: You can work this out.

18 All right. Thank you, Chris.

19 Is there anyone else who would like to
20 put comments on the record tonight? Okay. In that
21 case, the time is now 7:18. If there are no
22 further requests to present testimony, we will end
23 the hearing.

24 Remember, written comments will be

1 accepted through the close of business on
2 April 23rd. Again, they can be sent to David
3 O'Toole, Site Coordinator, Ohio EPA Central
4 District Office, PO Box 1049 Columbus, Ohio
5 43216-1049.

6 This concludes tonight's hearing. Thank
7 you.

8 - - -

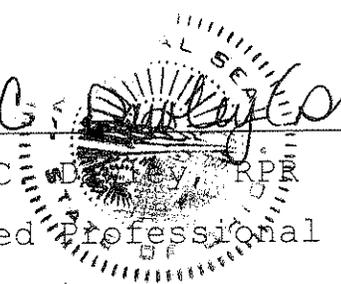
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CERTIFICATE

- - -

I do hereby certify that the foregoing is a true, correct, and complete transcript of the proceedings in this matter on April 14th, 2010, taken by me and transcribed from my stenographic notes.

Celeste C. Fraley (omt)
Celeste C. Fraley, RPR
Registered Professional
Court Reporter



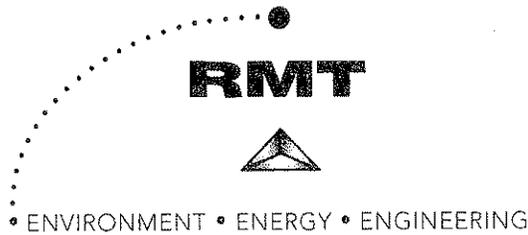
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<p>A</p> <p>abandoned 6:16 able 4:22 6:15 accept 1:12 2:5 accepted 9:1 accordance 4:3 accurate 5:2 action 2:19 actions 2:15 3:24 activities 2:15 addition 7:18 additional 6:19 7:20 address 3:6 5:5 adequate 7:8 adequately 6:8 7:2 adjacent 7:20,23 afford 4:20 after 2:23 3:16 again 7:12 9:2 agency 1:2 2:15 3:9 5:5 8:3 agenda 3:6 along 3:20 already 4:10 alternative 5:22 6:14 7:3,4 alternatives 7:10 amount 6:17 announce 2:11 answer 4:22 answered 8:8 anyone 8:19 anything 7:12 appealable 4:1,5 4:7 Appeals 4:1,6,7 Appearances 1:15 April 1:7 2:2,22 9:2 10:5 aquifer 6:23,24 6:24 aquifers 6:23 area 2:12 6:3 asking 6:18 8:6 Associates 5:19 available 4:13 8:15</p> <hr/> <p>B</p> <p>before 6:11 8:4 being 6:15 7:22 8:1</p>	<p>beneath 6:3 between 7:19 big 6:17 Blacklick 2:8 Blatt 2:8 blue 4:11 Board 4:2 both 7:17 8:15 Boulevard 2:8 Box 3:5 9:4 business 2:22 9:1</p> <hr/> <p>C</p> <p>C 10:10 call 5:13 8:9,14 capture 6:3 card 4:11 cards 4:12 case 8:21 cases 4:3 Celeste 10:10 Central 3:4 9:3 CERTIFICATE 10:1 certify 10:3 characterized 7:2 checked 8:15 Chris 5:17,17,18 8:14,18 circumstances 2:24 citizens 4:21 clarifying 4:24 cleanup 2:6 clear 8:11 close 2:21 9:1 Cobel 5:17,18,18 Columbus 3:5 9:4 come 5:13 6:2 comment 2:11 comments 1:13 2:5,17,20,22 3:2,9,10,11,13 3:15,17,20,22 4:16 5:4,6 6:10 8:11,20,24 Commission 4:2 communicated 3:21 Company 2:7 complete 5:1 10:4 completed 4:10 compounds 6:12</p>	<p>6:13 7:16 concern 6:17 concerned 6:13 concerns 5:5,19 concludes 9:6 conference 8:9 confidence 7:1 consideration 3:12,16 considered 2:23 contaminant 6:8 contaminants 7:11 contamination 7:7 continue 6:1,11 7:15 Coordinator 3:4 9:3 correct 10:4 county 2:9,14 4:6 couple 7:18 Court 4:6,7,7 10:11 courtesy 5:7 covenant 5:23 cross-examina... 4:17 currently 7:22</p> <hr/> <p>D</p> <p>date 2:23 8:5 Dave 8:15 David 1:18 3:3 9:2 Dawley 10:10 decision 3:18,19 3:20 4:5 deep 6:19,21,24 7:1,20,23 deeper 7:14 detections 6:12 7:15,17 directly 6:3 Director 2:19 3:15,24 discontinued 6:16 district 3:4 6:18 9:4 document 3:14 done 6:6 door 5:20 drop-dead 8:5 during 4:23</p>	<p>E</p> <p>Each 4:14 Eagon 5:18 elected 5:7,11 end 8:22 ensure 5:1 environmental 1:2 4:1,4 EPA 2:10,19,21 3:4 4:3,12,18 4:24 9:3 EPA's 2:6,13 4:20 ERAC 4:2,5 estimated 7:17 Evening 2:1 everything 7:10 experience 7:6 extent 6:8</p> <hr/> <p>F</p> <p>face-to-face 8:10 facility 5:21 6:2 6:4,6 feeling 6:7 7:13 feet 6:20 few 8:11 field 7:16,19 filed 3:2 final 2:19 3:18 3:19,19,24 first 5:10,16 follow-up 8:13 foregoing 10:3 form 5:4 former 2:7 forward 5:13 found 3:6 Franklin 1:13 2:7,8 4:6 7:19 7:22 Friday 8:16 from 4:2 6:1 10:6 further 8:22</p> <hr/> <p>G</p> <p>Gahanna 1:3,5 give 5:9 given 3:10,11,11 gives 7:12 goes 6:3 going 5:23 6:10 good 6:7 7:13 groundwater</p>	<p>5:24</p> <hr/> <p>H</p> <p>Hamilton 1:4 hearing 1:12 2:5 2:11 3:1,7,14 3:23 4:10,23 4:23 8:23 9:6 hearings 4:19,20 High 1:3 Hopefully 7:9</p> <hr/> <p>I</p> <p>identified 6:9 important 3:8 include 7:4 included 2:20 individual 4:14 input 4:21 issued 2:13</p> <hr/> <p>J</p> <p>Jed 1:16 Jefferson 7:21 just 8:1,14</p> <hr/> <p>K</p> <p>Ken 1:17 kind 7:1,7 know 3:8 8:6 known 3:15 5:9</p> <hr/> <p>L</p> <p>laws 4:4 leaning 6:18 like 5:11 8:3,8,19 limited 6:16 7:6 Lincoln 1:3 list 8:1 lists 2:14 located 2:7 locations 7:24 long 6:14 lot 6:5</p> <hr/> <p>M</p> <p>made 3:13,19 maintained 7:5 make 3:18 5:8 matter 1:11 10:5 may 2:23 4:14,24 meet 8:3 meeting 8:10,14 migrated 7:14 migration 6:8 Monday 8:16</p>	<p>monitored 7:22 monitoring 6:6 6:15,16,19,22 7:4,16,20,24 more 8:5,7 most 6:22 must 2:21</p> <hr/> <p>N</p> <p>name 5:13,14 namely 7:23 need 7:5 newspapers 2:12 next 5:20 notes 10:7 notice 2:10,13 noticed 5:22 number 5:23 7:4</p> <hr/> <p>O</p> <p>Obviously 5:19 occurring 6:22 Office 3:4,5 9:4 officer 4:23 official 2:5,18,20 3:1 officials 5:7,11 Ohio 1:1,5 2:6 2:10,13,16,18 2:21 3:4,5 4:3 4:8,12,18,20 4:23 9:3,4 Ohio's 4:4 Okay 8:20 once 3:19 4:14 One-S 7:23 only 4:14 opportunity 4:21 5:10 oral 1:12 2:17 order 4:6 organic 6:12 originates 6:1 others 4:16 out 5:7 6:23 8:17 over 6:6,14 O'Toole 1:18 3:3 9:3</p> <hr/> <p>P</p> <p>PAHs 6:13 part 2:18,24 Perhaps 8:8 period 2:11 7:6 permit 2:24 person 5:16</p>
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<p>persons 3:21,22 phrase 5:3 place 2:15 plan 2:6 please 4:11 5:3 5:13 PO 9:4 possible 5:2 Post 3:5 potentially 8:4 preferred 2:6 present 3:22 4:9 8:22 presented 3:17 prior 2:19 8:10 proceed 5:14 proceedings 10:5 Professional 10:11 program 3:17 property 7:17 proposal 2:12 PROTECTION 1:2 provide 4:21 8:9 providing 4:16 public 1:12 2:4 2:10,11 3:14 3:18 4:18,20 5:20 publication 2:14 published 2:10 purpose 2:4 put 6:10,19 8:1 8:20 putting 7:18 P.M 1:8</p> <hr/> <p style="text-align: center;">Q</p> <p>quantified 7:17 question 5:3,4 questions 3:13 4:17,22,24 8:5 8:7,7</p> <hr/> <p style="text-align: center;">R</p> <p>reality 5:24 receive 5:12 received 2:17,21 2:22 3:9 recommendati... 3:16 record 2:6,18,20 3:1 5:1,14 8:20 reduce 7:11 regarding 1:13</p>	<p>2:6,12 Registered 10:11 registration 4:13 remediation 7:9 Remember 8:24 removal 7:10 Reporter 10:11 representative 4:12,24 representatives 4:18 request 5:8 requesting 5:16 requests 8:22 respectful 4:16 responded 3:14 response 3:15,20 5:6 results 6:15 return 4:11 Review 2:13 4:1 reviewed 2:18 reviews 4:3 right 5:20 6:21 8:18 Road 1:4 RPR 10:10 rules 4:4</p> <hr/> <p style="text-align: center;">S</p> <p>same 3:12 sampled 8:1 School 1:3 Schultz 1:17 8:13 screened 6:20 see 6:11 seen 7:12 selected 5:22 6:14 7:3,9 semi-volatile 6:13 sent 9:2 separate 4:2 Session 2:1 set 8:14 Sewer 7:21 shallow 6:5,22 6:24 7:11 8:1 site 2:7 3:3 7:7 9:3 soil 7:10 some 6:12,19 7:1 speaker 4:18 speakers 5:1 spell 5:14</p>	<p>staff 3:17 state 1:1 2:16 5:13 states 7:3 Steel 1:13 2:7 7:19,22 stenographic 10:6 submit 8:10 submitted 3:3,21 supply 5:20 Supreme 4:7</p> <hr/> <p style="text-align: center;">T</p> <p>table 4:13 taken 10:6 taking 2:15 3:16 term 6:14 testify 4:14 5:10 5:11,16 testimony 3:22 4:9 5:12,15 8:22 Thank 8:18 9:6 their 4:16 themselves 5:8 things 7:13 8:11 Thorp 1:16 2:4 8:17 Three-S 7:23 through 9:1 time 2:23 4:11 4:15 5:9 6:17 7:6 8:9,21 tonight 3:3,10,11 4:10 5:8 8:20 tonight's 3:23 9:6 toward 6:18 transcribed 10:6 transcript 10:4 true 10:4 two 5:23 6:23 7:4 7:24 type 4:19</p> <hr/> <p style="text-align: center;">U</p> <p>underneath 6:2 understand 8:6 understanding 6:21 use 4:15 5:24 6:1</p> <hr/> <p style="text-align: center;">V</p> <p>verbal 3:11 vertical 6:7</p>	<p>volatile 6:12</p> <hr/> <p style="text-align: center;">W</p> <p>want 6:24 water 5:20 6:1 7:21 Wednesday 1:7 2:1 Weekly 2:13 well 7:16,19 wells 6:3,15,19 6:20 7:5,16,19 7:21,24 wisely 4:15 wish 4:9 work 8:17 writing 3:9 5:5 6:11 written 1:13 2:17,20 3:2,10 8:11,24</p> <hr/> <p style="text-align: center;">Y</p> <p>years 6:2,6</p> <hr/> <p style="text-align: center;">Z</p> <p>zone 7:1,11 8:2</p> <hr/> <p style="text-align: center;">1</p> <p>1049 3:5 9:4 1385 2:8 14 1:7 2:2 14th 10:5 16th 8:16 19th 8:16</p> <hr/> <p style="text-align: center;">2</p> <p>2010 1:7 2:2,22 10:5 23 2:22 23rd 6:11 8:4,4 9:2</p> <hr/> <p style="text-align: center;">4</p> <p>43216-1049 3:5 9:5</p> <hr/> <p style="text-align: center;">6</p> <p>6:30 1:8 630 1:4</p> <hr/> <p style="text-align: center;">7</p> <p>7:18 8:21 75 6:20</p> <hr/> <p style="text-align: center;">9</p>	<p>90 6:20</p>
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APPENDIX B

Public Comments Received on Ohio EPA's
February 2010 Preferred Plan



March 26, 2010

David M. O'Toole, Jr.
Site Coordinator
Ohio Environmental Protection Agency – Central District Office
Division of Emergency and Remedial Response
50 West Town Street, Suite 700
Columbus, Ohio 43215

Subject: FRANKLIN STEEL (a.k.a. Columbus Steel Drum)
Franklin County
Project I.D. No. 125-001368-005
Comments to draft Preferred Plan

Dear Mr. O'Toole:

On behalf of Franklin Steel Company, Inc. (Franklin Steel), RMT, Inc. (RMT) is submitting the attached comments to the Preferred Plan that Franklin Steel believes should be addressed in the Final Decision Document for the remediation of the Franklin Steel (a.k.a. Columbus Steel Drum) property. These comments were outlined in our March 19, 2010 electronic mail correspondence.

Franklin Steel appreciates your consideration of these comments, and would be happy to discuss them with you. If you have any questions, or wish to discuss these comments, please contact me at (614) 793-0026 extension 6211.

Sincerely,

RMT, Inc.

Larry S. Smith, P.E.
Senior Client Service Manager

Attachments

cc: Laura B Paul, Franklin Steel Company
Paul Coval, Vorys, Sater, Seymour and Pease
Central Files

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Proposed Language for Franklin Steel Final Decision Document

The following language is proposed to replace paragraphs 3, 4 and 5 of Sections of 7.3.2 and 9.3 from the Preferred Plan:

During the two-year compliance period, groundwater samples would be collected semiannually from six wells for specific chemicals of concern (COCs) as follows:

- S107-MW-02 – arsenic
- S101-MW01R – arsenic
- S109-MW06 – VOCs, SVOCs, arsenic, natural attenuation parameters
- S109-PZ02 – VOCs
- S109-PW07 – VOCs
- S201-MW02 – SVOCs

The natural attenuation indication parameters would signify biological activity in the ground water is occurring, and these parameters include alkalinity, chlorides, dissolved oxygen, and sulfates. Statistical trend analysis of the sampling data results may be performed to evaluate any trends in the concentrations of COCs over time. Groundwater flow and contaminant fate and transport modeling may also be performed to estimate the rate and extent of migration of the COCs from the site.

If RAOs are met for all COCs specific to each monitoring well at the end of the 2-year compliance period, then 3 years of detection monitoring would be conducted to verify that natural attenuation is occurring and RAOs continue to be met. For the 3-year detection monitoring period, samples would be collected semiannually and analyzed for VOCs from the following wells: S109-MW06, S101-MW07, and S109-PZ02. After the 5-year period, the monitoring program would be completed.

If RAOs are not met for all COCs at the end of the 2-year compliance period, then 3 years of detection monitoring would also be conducted as stated above. If after the 5-year period, COCs have not reached S109-MW07 or S109-PZ02 above the RAOs, the monitoring program will be completed. However, if the concentrations of COCs in either S109-MW07 or S109-PZ02 are above the RAOs during the monitoring period, then Franklin Steel would need to develop a contingent active remedy.



CITY OF GAHANNA

April 22, 2010

Mr. David O'Toole
Ohio EPA
Central District Office
Division of Emergency and Remedial Response
P.O. Box 1049
Columbus, OH 43216-1049

Re: Columbus Steel Drum Preferred Clean-Up Plan – 1385 Blatt Blvd.

Dear Mr. O'Toole:

The City of Gahanna is in full support of the proposed clean-up plan for the active portion of the CSD site. The City's Interdiction Team has worked closely through the years with the Air Pollution Control Central District Division of the Ohio EPA regarding this site and will continue to do so. We would welcome the long-overdue remediation of the site and will assist the Ohio EPA in any manner possible.

We are, however, aware that CSD has been found in contempt of court on past orders from the Air Pollution Control Central District Division and are a bit skeptical as to whether or not the requirements of the clean-up plan will actually be implemented by CSD and the site remediated. This past lack of compliance with directives raises several questions:

- How will the Ohio EPA ensure that the plan is carried out?
- What is the proposed time frame?
- Will the clean-up be funded by some sort of grant or is CSD totally financially responsible?
- By what means will the site be monitored and who will enforce the environmental covenant to limit site activity and ground water use?
- Will the ground area where the approximately 55,000 drums are currently stored be monitored as well as the area used to store the additional 11,000 drums inside numerous semi-trailers?



"HERB CAPITAL OF OHIO"

200 SOUTH HAMILTON ROAD • GAHANNA, OHIO 43230
614-342-4000 PHONE • 614-342-4100 FAX • WWW.GAHANNA.GOV

April 22, 2010
Mr. David O'Toole
Page Two

- Can contaminants leach through, or around, the existing concreted areas, and if so, how will this be addressed?
- Can the OEPA require CSD to provide a less permeable exterior area such as asphalt or concrete?
- Could the two 10 acre inactive sites still be leaching contaminants to surrounding soil and water? Are they included in the clean-up plan?

If you would please provide answers to these questions, it would certainly go a long way toward raising our comfort level with the proposed plan. Thank you for your time and attention to this matter. If you have any questions or need further information, I can be reached at (614) 342-4025.

Very truly yours,

A handwritten signature in cursive script that reads "Bonnie Gard /srp".

Bonnie Gard
Planning & Zoning Administrator

BG/srp

EAGON & ASSOCIATES, INC.
Consulting Geologists

100 Old Wilson Bridge Road, Suite 115 / Worthington, Ohio 43085 / (614) 888-5760 / FAX (614) 888-5763

April 23, 2010

Mr. David M. O'Toole
Division of Emergency and Remedial Response
Central District Office
Ohio EPA, Lazarus Government Center
50 W. Town Street, Suite 700
Columbus, Ohio 43216

**RE: Preferred Plan for the Remediation of the Franklin Steel Site
Franklin County, Ohio**

Dear Mr. O'Toole:

On behalf of Jefferson Water & Sewer District, Eagon & Associates, Inc. is providing comments on the "Preferred Plan for the Remediation of Franklin Steel Company, Inc. (a.k.a. Columbus Steel Drum)" prepared by the Ohio EPA.

Please contact me at 614-888-5760 if you have any questions or need additional information.

Sincerely,



Christopher J. Cobel
Environmental Scientist

CJC/kj

encl.

cc: Robert Stewart, JWSD, w/encl.

**COMMENTS ON THE
PREFERRED PLAN FOR REMEDIATION
OF THE FRANKLIN STEEL SITE
FRANKLIN COUNTY, OHIO**

Prepared for:

JEFFERSON WATER & SEWER DISTRICT

Prepared by:

EAGON & ASSOCIATES, INC.
Worthington, Ohio

April 22, 2010

EAGON & ASSOCIATES, INC.
100 Old Wilson Bridge Road, Suite 115
Worthington, Ohio 43085
(614) 888-5760

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FIGURES

- Figure 1. Franklin Steel Potentiometric Surface Map, October 2009
Figure 2. Susceptibility Analysis – Taylor Road Well Field
Figure 3. Cross-Section A-A'

TABLES

- Table 1. Results for bis (2-ethylhexyl) phthalate, Jefferson Water & Sewer District Monitoring Network
Table 2. Results for bis (2-ethylhexyl) phthalate, Franklin Steel Monitoring Network
Table 3. SVOC and PAH Parameters Detected in JWSD Monitoring Wells MW-1S and MW-3S
Table 4. Screen Depth Information, Taylor Road Well Field and Franklin Steel Monitoring Systems

INTRODUCTION

On behalf of the Jefferson Water & Sewer District (JWSD), Eagon & Associates, Inc. is submitting comments on the “Preferred Plan for the Remediation of Franklin Steel Inc. (a.k.a. Columbus Steel Drum), Franklin County, Ohio” prepared by the Ohio EPA and dated February 25, 2010. The JWSD operates the Taylor Road Well Field located immediately to the northeast of the Franklin Steel site. The well field supplies water to approximately 10,000 residents in Jefferson Township. Ground-water demand is met by pumping a system of three production wells from the Taylor Road and Wengert Road well fields. Production wells WSW-1, WSW-2, and WSW-3 are shown on Figure 1. Current ground-water demand is in the range of 0.6 to 1.2 million gallons per day. Ground-water monitoring wells MW-1S, MW-1D, MW-2S, MW-2D, MW-3S, and MW-3D were installed by the Jefferson Water & Sewer District to monitor ground-water quality impacts as a result of contamination at the Franklin Steel site (see Figure 1).

HYDROGEOLOGIC SETTING

Aquifer Susceptibility Analysis

The Franklin Steel site is located between the 1- and 5-year time-of-travel for the well field (see Figure 1). The Franklin Steel site is therefore located within the Taylor Road Well Field Wellhead Protection Area (WHPA). Additional information regarding the Taylor Road Well Field can be found in the Ohio EPA approved Drinking Water Source Protection Plan (DWSPP) prepared by JWSD. The DWSPP contains the susceptibility analysis prepared by the Ohio EPA which indicates that the Taylor Road Well Field has a relatively high susceptibility to contamination (see Figure 2). The Ohio EPA made the determination based on the following factors:

1. the buried valley aquifer is a regionally extensive thick, permeable sand and gravel deposit, and is sensitive to potential ground-water contamination;
2. the aquifer is overlain by only 10-25 feet of sandy clay with gravel in some areas;
3. potential contaminant sources exist within the protection area; and

4. there is documented ground-water contamination within the wellhead protection area.

There is no continuous, low permeability, confining layer over the deeper aquifer in which the JWSD production wells are screened. Therefore, there is no natural protection to prevent the downward migration of contaminants. Figure 3 contains a cross section through the JWSD production wells illustrating the lack of a continuous low-permeability confining layer. The cross sections, prepared by SAIC and contained in the August 2000 RFI report, also do not display a confining bed that would prevent the downward migration of surface or near-surface contamination. The fact that the aquifer is highly susceptible to contamination is cause for significant concern with respect to contamination at the Franklin Steel site, and forms the basis of the JWSD's comments on the Preferred Plan prepared by the Ohio EPA.

Ground-Water Flow

Regionally, ground-water flow is generally from the east to the west. There is some down-valley flow out of the area to the south of the Taylor Road Well Field. However, local ground-water flow is toward the well field due to pumping. Figure 1 displays the potentiometric surface for the Franklin Steel site as prepared by RMT using the October 2009 sampling event data. As shown, ground-water flow is from the Franklin Steel site toward the JWSD's Taylor Road Well Field. As a result, contamination originating at the Franklin Steel site can be transported to the well field. Ground-water monitoring performed by JWSD since 1988 has identified sporadic low level detections of bis (2-ethylhexyl) phthalate at the well field. No detections of this parameter were reported for the JWSD 2009 annual sampling event for any monitoring or production wells at the Taylor Road Well Field.

GROUND-WATER CONTAMINATION AND PROPOSED MONITORING

JWSD has monitored the well field water quality for approximately 22 years. Based on previous investigations by Franklin Steel, the parameter bis (2-ethylhexyl) phthalate has been a parameter of concern. Detections of this contaminant have been observed over time in both the

JWSD monitoring wells and production wells. Most detections of bis (2-ethylhexyl) phthalate observed from JWSD's annual sampling events have been low level detections and have been reported below the MCL of 6.0 ug/L. Tables 1 and 2 provide a summary of these detections. Bis (2-ethylhexyl) phthalate is a known contaminant at the Franklin Steel site. The fact that detections of this parameter have been observed in the production wells and deep monitoring wells clearly indicates that a pathway exists from the Franklin Steel site to the deeper aquifer. However, there has been no evaluation on the Franklin Steel site of the deeper aquifer to adequately assess the vertical extent of contamination deeper in the aquifer.

Table 3 is a summary of the most recent detections of semivolatile organic compounds (excluding bis (2-ethylhexyl) phthalate) and polynuclear aromatic hydrocarbons observed in JWSD's monitoring wells MW-1S and MW-3S located at the Taylor Road Well Field. These data are based on samples collected by Franklin Steel during semiannual sampling events conducted during May and October 2009. JWSD does not currently monitor for chrysene, fluoroanthene, or butyl benzyl phthalate.

Proposed Monitoring Network

The proposed monitoring network in the Preferred Plan is incapable of monitoring the extent of contamination in the deeper aquifer as the existing Franklin Steel monitoring wells are not deep enough to monitor the aquifer within the interval that the JWSD's production wells are screened. As a result, there is no potential for the network to provide an early warning indication of contamination before it reaches the well field.

Table 4 provides the screened interval for the JWSD production wells, monitoring wells, and the bottom screen elevation of the Franklin Steel monitoring wells. The Franklin Steel screen elevations were derived by subtracting well depth found on field sampling sheets from the top-of-casing elevations provided in historical sampling reports submitted to Eagon & Associates by SAIC. Screen elevation data also are shown on Figure 1. As shown, only two wells are sufficiently deep to reach the horizon in which the JWSD's production wells are screened. Furthermore, these

wells are interior to the site and are not downgradient of the facility. Therefore, it is concluded that the proposed network can provide no early warning of contamination that may be migrating in the deeper aquifer toward the well field. These wells (S108-MW06D and S109-MW05D) are not included in the proposed monitoring network included in the Preferred Plan based on information provided to JWSD during the April 19, 2010 meeting held at Ohio EPA.

The proposed monitoring network also eliminates semiannual monitoring of JWSDs monitoring wells MW-1S and MW-3S. Based on continued detections of contaminants from Franklin Steel in these monitoring wells, they should not be excluded from the network. In addition, JWSD monitoring wells MW-1D and MW-3D should be added to the network as they are completed within the screened interval of the production wells. Monitoring wells MW-1D and MW-3D are wells that are sufficiently deep and that are located downgradient of the facility and that are capable of providing an early indication of contamination before it reaches the production wells. However, wells MW-1D and MW-3D are located too close to the production wells to provide an adequate early warning. Therefore, it is requested that at least two additional deep monitoring wells be installed downgradient of the facility and that these wells be included in the long-term monitoring network.

Figure 1 displays the proposed area downgradient of Franklin Steel where deeper wells should be installed. The installation of at least two wells in this area, spaced across the flow path, would provide for greater protection of the well field. These two deeper wells would be the only deep monitoring wells capable of detecting contamination in the deeper aquifer before it leaves the site. JWSD would like to provide input on well design specifications relative to the installation of these wells. Franklin Steel monitoring well S201-PZ01 also is not currently included in the proposed network. This well has displayed recent detections of bis (2-ethylhexyl) phthalate and butyl benzyl phthalate which have both been detected in JWSD's monitoring wells. Therefore, it is requested that this well be included in the proposed monitoring network.

Monitoring Parameters

JWSD currently samples for 12 metals, ammonia, sulfate, and the 51+8 VOC list (or 524.2 drinking water list) plus bis (2-ethylhexyl) phthalate. The burden of cost associated with sampling for the full Franklin Steel monitoring list should not be placed on JWSD. It is recommended that monitoring wells MW-1D and MW-3D be sampled by Franklin Steel for the same monitoring list used to sample the Franklin Steel monitoring wells and JWSD wells MW-1S and MW-3S.

The Preferred Plan does not contain Preliminary Remediation Goals (PRGs) for the recently detected parameters shown on Table 3. It is unknown if Franklin Steel has evaluated these parameters to determine if they are applicable compounds to be monitored in the Preferred Plan. It is requested that these parameters be evaluated since they have been detected in JWSD's monitoring wells.

Proposed Ground-Water Remediation Alternative

Alternative No. 2 in the Preferred Plan includes monitored natural attenuation with institutional controls. It indicates that the monitoring wells be maintained for a "limited period of time". It is requested that water-quality results from the JWSD's monitoring wells and production wells be taken into consideration as part of the determination as to when monitoring can cease at Franklin Steel. In addition, the Alternative No. 2 should ensure reduction in constituents of concern (COC) levels not only in the upper ground-water zone, but also in the deep ground-water zone, if it is determined through deep aquifer monitoring that contamination exists. With respect to the covenant on the property to prohibit use of the ground water for potable purposes, the reality is that despite this covenant, ground-water originating from under the Franklin Steel site is pumped from the production wells at the Taylor Road Well Field now for potable purposes, and will be into the future after monitoring may have ceased. For this reason, monitoring at the Franklin Steel site should continue long enough to ensure that remedial activities have eliminated the risk to the well field.

CONCLUSIONS AND REQUESTED CHANGES TO THE PREFERRED PLAN

Conclusions

- Contamination originating from the Franklin Steel site has been identified at low level concentrations at the Taylor Road Well Field.
- The current monitoring network at the Franklin Steel site is incapable of determining the vertical extent of contamination within the screened interval of the JWSD production wells.
- The current monitoring network in the Preferred Plan cannot provide an early indication of contamination before it reaches the production wells in the Taylor Road Well Field.
- The Preferred Plan does not take into account potential contamination that may be present in JWSD's wells relative to the determination of when monitoring should cease.
- The proposed Alternative No. 2 does not take into account contamination deeper in the aquifer with respect to determining if and when monitoring should cease. Because potential contamination in the deeper aquifer has not been adequately assessed, the proposed duration of monitoring may be too short.

Requested Changes to the Preferred Plan

- It is requested that JWSD wells MW-1S, MW-1D, MW-3S, and MW-3D be included in the monitoring network.
- It is requested that Franklin Steel monitoring well S201-PZ-01 remain in the network.
- It is requested that at least two additional deep monitoring wells be installed and monitored as part of the network. If significant contamination is identified in the deeper aquifer, additional wells should be installed, as necessary, to characterize the full extent of contamination in the aquifer.
- The Preferred Plan should include PRGs for recently detected parameters that are not currently included, if appropriate.

- The Preferred Plan should ensure reduction in COC levels in both the upper ground-water zone and lower ground-water zone if it is determined that COCs are present in the deeper aquifer before monitoring can cease.

FIGURES

ATTACHMENT A

Susceptibility Analysis, Protective Strategies and Proposed Consumer Confidence Report Language for Jefferson Water & Sewer District, Taylor Road Wellfield

Susceptibility Analysis:

The aquifer that supplies drinking water to Jefferson Water & Sewer District's Taylor Road Wellfield has a relatively high susceptibility to contamination. This determination was made because of the following reasons:

- ▶ The buried valley aquifer is a regionally extensive thick, permeable sand and gravel deposit, and is sensitive to potential ground water contamination;
- ▶ The aquifer is overlain by only 10-25 feet of sandy clay with gravel in some areas;
- ▶ Potential contaminant sources exist within the protection area; and
- ▶ There is documented ground water contamination within the wellhead protection area.

Ground Water Quality. A review of Jefferson Water & Sewer District's water quality record currently available in Ohio EPA's drinking water compliance database did not reveal any evidence of chemical contamination in the District's supply wells.

This water quality evaluation has some limitations:

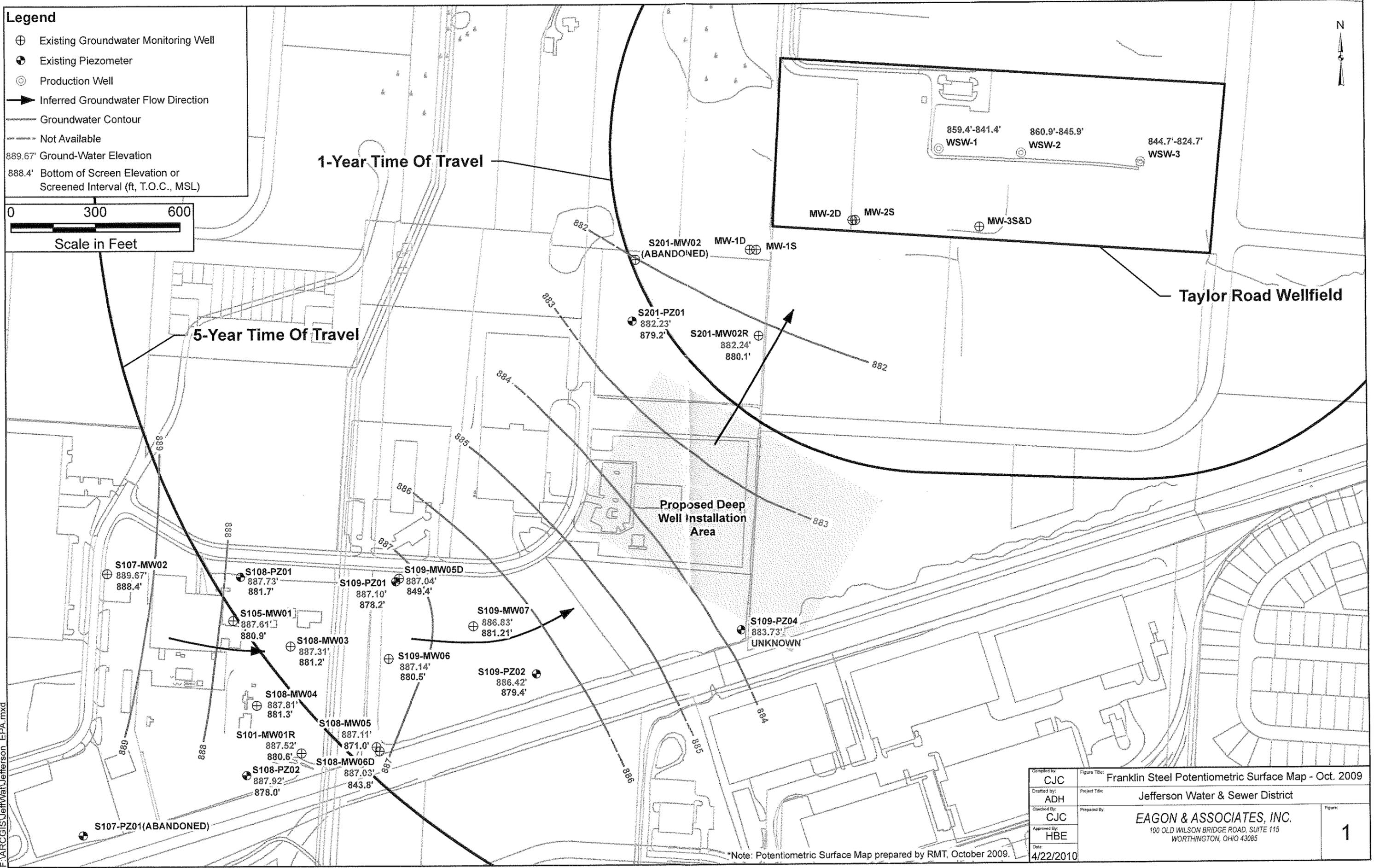
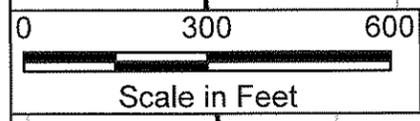
- 1) The database evaluated is for treated water samples only, as Ohio EPA's quality requirements are for the water being provided to the public, not the water before treatment.
- 2) Sampling results for coliform bacteria and naturally-occurring inorganics were not evaluated for this assessment, because they are not a reliable indicator of aquifer contamination.

Although the drinking water provided by Jefferson Water & Sewer District meets drinking water quality standards, ground water contamination has been documented in this aquifer, related to an industrial facility located at the outermost boundary of the wellhead protection area. The industrial facility plans to implement corrective measures and the District has a network of ground water quality monitoring wells within the wellfield to provide early warning if the plume should approach the pumping wells.

Potential Contaminant Source Inventory. The Jefferson Water & Sewer District has identified 36 potential contaminant sources that lie within the determined wellhead/source water protection area for the Taylor Road Wellfield, two of which are located within the inner management zone (or one-year time-of-travel zone). Some of the types of potential contaminant sources present are the CSX/Ohio Central railway,

FIGURE 2.

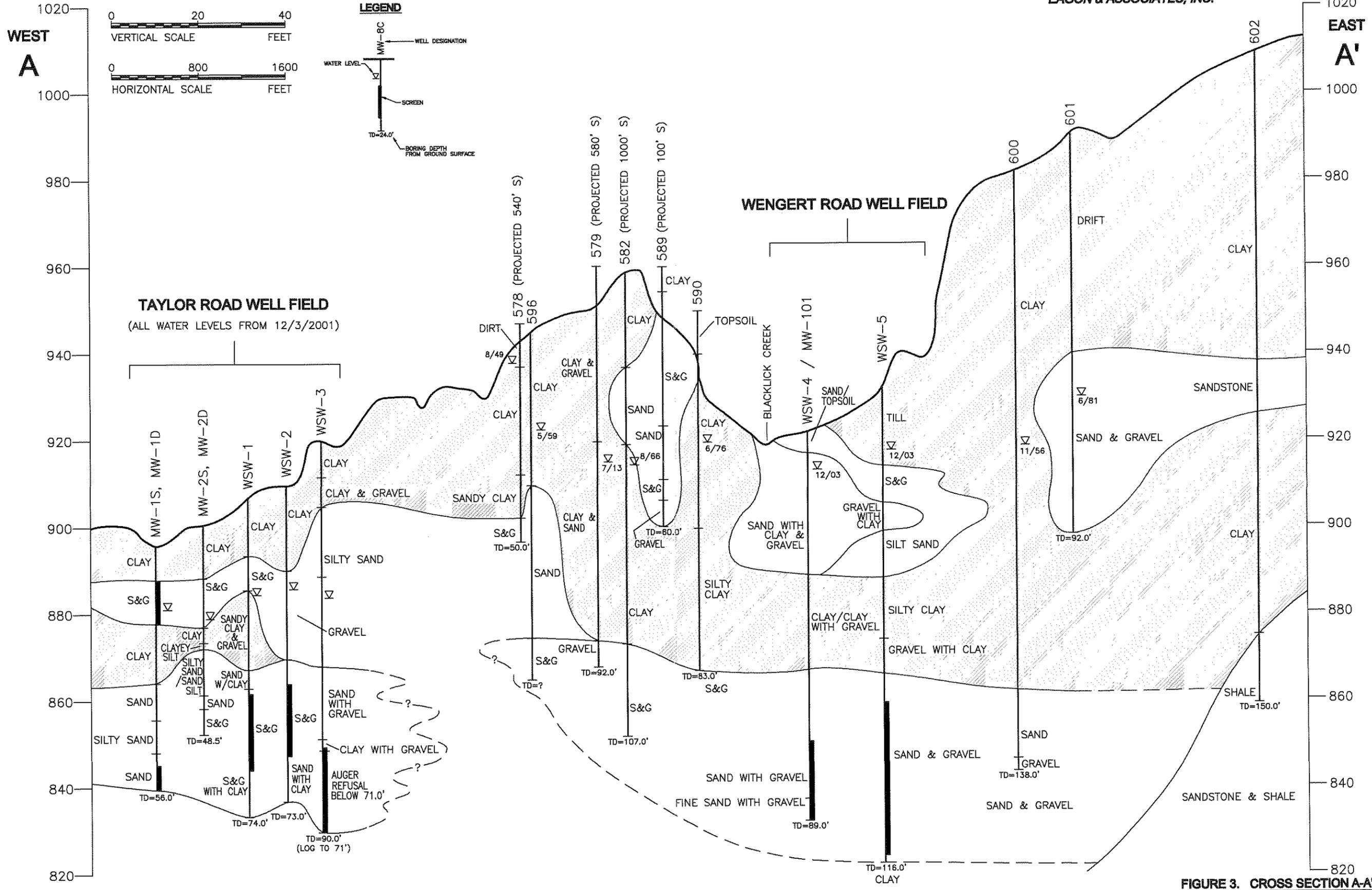
- Legend**
- ⊕ Existing Groundwater Monitoring Well
 - ⊕ Existing Piezometer
 - ⊙ Production Well
 - ➔ Inferred Groundwater Flow Direction
 - Groundwater Contour
 - - - - - Not Available
 - 889.67' Ground-Water Elevation
 - 888.4' Bottom of Screen Elevation or Screened Interval (ft, T.O.C., MSL)



F:\ARCGIS\JeffWat\Jefferson_EPA.mxd

Compiled by: CJC	Figure Title: Franklin Steel Potentiometric Surface Map - Oct. 2009
Drafted by: ADH	Project Title: Jefferson Water & Sewer District
Checked by: CJC	Prepared By: EAGON & ASSOCIATES, INC.
Approved By: HBE	100 OLD WILSON BRIDGE ROAD, SUITE 115 WORTHINGTON, OHIO 43085
Date: 4/22/2010	Figure: 1

*Note: Potentiometric Surface Map prepared by RMT, October 2009.



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FIGURE 3. CROSS SECTION A-A'

TABLES

**TABLE 1. RESULTS FOR bis(2-ethylhexyl) phthalate
JEFFERSON WATER AND SEWER DISTRICT MONITORING NETWORK
(INCLUDING FRANKLIN STEEL RESULTS FOR MW-1S & MW-3S)**

Well	Units	03/26/98 ¹	07/01/98 ¹	09/30/98 ¹	12/17/98 ¹	03/11/99 ¹	09/02/99	12/06/99	12/22/99 ¹	03/20/00 ¹	06/06/00 ¹	10/27/00 ¹	11/27/00	04/04/01 ¹	10/10/01 ¹	12/03/01	11/26/02	01/15/03 ¹	11/24/03
MW-1S	ug/L	<10.0	<10.0	<10.0	<10.0	<10.0		0.62	<10.0	<10.0	<10.0	<10.0	<0.60	<10.0	<10.0	0.93	<0.60	<10.0	<0.60
MW-1D	ug/L	<10.0	3.0 J	<10.0	<10.0	<10.0		<10.0	<10.0	<10.0	<10.0	<10.0	<0.60	<10.0	<10.0	<0.60	<0.60	<10.0	<0.60
MW-2S	ug/L						<0.60	1.2	<10.0				<0.60			<0.60	<0.60		<0.60
MW-2D	ug/L						0.87	0.65	<10.0				<0.60			0.66	<0.60		<0.60
MW-3S	ug/L	<10.0	<10.0	<10.0	<10.0	<10.0		<0.60	<10.0	<10.0	<10.0	<10.0	<0.60	<10.0	<10.0	1.60	<0.60	<10.0	<0.60
MW-3D	ug/L	8.5 J	<10.0	<10.0	<10.0	<10.0		<0.60	<10.0	<10.0	<10.0	<10.0	<0.60	<10.0	<10.0	0.81	<0.60	<10.0	<0.60
WSW-1	ug/L						<0.60	<0.60	<10.0				<0.60			<0.60	<0.60		<0.60
WSW-2	ug/L						<0.60	<0.60	<10.0				<0.60			<0.60	<0.60		<0.60
WSW-3	ug/L						<0.60	<0.60	<10.0				<0.60			0.98	<0.60		<0.60

¹ Samples collected by SAIC.

² Samples collected by Burgess and Niple. The value 3.11 is the MDL for bis(2-ethylhexyl)phthalate

³ Samples collected by RMT Inc. The value 3.11 is the MDL for bis(2-ethylhexyl)phthalate

J - indicates an estimated result

¹ Sample
² Sample
³ Sample
J - indica

**TABLE 1. RESULTS FOR bis (2-ethylhexyl) phthalate
JEFFERSON WATER AND SEWER DISTRICT MONITORING NETWORK
(INCLUDING FRANKLIN STEEL RESULTS FOR MW-1S & MW-3S)**

Well	Units	12/23/03 ¹	11/10/04 ¹	11/22/04	12/13/05	03/30/06	05/05/06 ²	11/10/06 ²	11/21/06	12/26/07	5/21/08 ³	10/21/08 ³	11/24/08	05/29/09 ³	10/21/09 ³	12/01/09
MW-1S	ug/L	<10.0		<0.60	<0.60		<3.11	<3.11	<0.60	<0.60	<3.11	<3.11	0.44 J	<0.658	<0.658	<0.6
MW-1D	ug/L		1.3	<0.60	<0.60			2.1		<0.60			0.45 J			<0.6
MW-2S	ug/L		0.98			<0.60		<0.60	<0.60	<0.60			0.47 J			<0.6
MW-2D	ug/L			<0.60	<0.60			<0.60	<0.60	<0.60			0.61			<0.6
MW-3S	ug/L	0.45	0.88	0.6	<0.60	<0.60	<3.11	<3.11	<0.60	<0.60	<3.11			<0.882	<0.658	
MW-3D	ug/L		0.89		<0.60			<0.60	<0.60	<0.60			0.43 J			<0.6
WSW-1	ug/L		<0.60	<0.60	<0.60			<0.60	<0.60	<0.60			0.50 J			<0.6
WSW-2	ug/L		<0.60	<0.60	<0.60			<0.60	<0.60	<0.60			2.40			<0.6
WSW-3	ug/L		<0.60	<0.60	<0.60			<0.60	<0.60	<0.60			1.20			<0.6

¹ collected by SAIC
² collected by Burgess and Niple. The value 3.11 is the MDL for bis(2-ethylhexyl)phthalate
³ collected by RMT Inc. The value 3.11 is the MDL for bis(2-ethylhexyl)phthalate
 J is an estimated result

**TABLE 2. RESULTS FOR bis (2-ethylhexyl) phthalate
FRANKLIN STEEL MONITORING NETWORK**

Location	05/07/97	07/29/97	10/27/97	01/06/98	03/26/98	06/30/98	09/30/98	12/15/98	03/11/99	06/01/99	08/31/99	12/20/99	03/20/00	06/06/00
JTMW-3D	--	--	--	--	8.5J	ND								
JTMW-3S	--	--	--	--	ND									
JTMW-1D	--	--	--	--	ND	3.0J	ND							
JTMW-1S	--	--	--	--	ND	ND	ND	ND	10.0	ND	ND	ND	ND	ND
S201-PZ01	1.2J	ND	ND	ND	ND	5.4J	58	250	ND	ND	ND	ND	ND	ND
S201-MW02R	1.2J	8.8J	ND	--	ND	ND								
S109-PZ01	2.1J	ND	--	ND	ND									
S109-PZ02	2.10J	ND	--	ND	ND									
S109-MW05D	1.5J	ND	ND	ND	9.6J	ND	ND	9.3	ND	ND	ND	--	ND	ND
S109-MW06	ND	3	ND	ND	ND	--	ND	ND						
S109-MW07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S108-MW05	ND													
S108-MW06D	ND													
S108-MW03	ND	--	ND	ND										
S101-MW01R	ND	--	ND	ND										
S108-MW04	ND	--	ND	ND										
S108-PZ01	ND	ND	ND	ND	36.0	ND	ND	ND	ND	ND	ND	--	ND	ND
S108-PZ02	ND	4.0J	ND	--	ND	ND								
S105-MW01	ND	--	ND	ND										
S107-MW02	ND	18.0	ND	ND	--	ND	ND							
S107-PZ01	4.8J	1.5J	ND	ND	ND	ND	3.8	ND	ND	ND	ND	--	ND	ND
S100-MW01	ND	ND	2.3J	ND	ND	ND	ND	ND	5.80J	ND	ND	ND	ND	ND

-- Not Sampled
 ND - Nondetect
 J - Estimated Result in ug/L
 1 The value 3.11 is the MDL for bis (2-ethylhexyl) phthalate
 2 The MDL for bis(2-ethylhexyl)phthalate is 0.822 or 0.658
 Notes: MCL for bis(2-ethylhexyl)phthalate is 6 ug/L
 PQLs and MDLs are unknown for Franklin Steel Data provided prior to 2006

Data included in this table prior to 2006 provided by SAIC
 Data from 5/5/96 to 11/9/2006 provided by Burgess and Niple
 Data since 5/22/08 provided by RMT Inc.
 All values reported in ug/L

**TABLE 2. RESULTS FOR bis (2-ethylhexyl) phthalate
FRANKLIN STEEL MONITORING NETWORK**

Location	04/03/01	10/10/01	01/15/03	12/23/03	11/10/04	05/05/06 ¹	11/09/06 ¹	05/22/08 ¹	10/22/08 ¹	05/29/09 ²	10/21/09 ²
JTMW-3D	--	--	--	--	--	--	--	--	--	--	--
JTMW-3S	ND	ND	ND	ND	0.88J	<3.11	<3.11	<3.11	--	<0.882	<0.658
JTMW-1D	--	--	--	--	--	--	--	--	--	--	--
JTMW-1S	ND	ND	ND	ND	--	<3.11	<3.11	<3.11	<3.11	<0.658	<0.658
S201-PZ01	ND	ND	ND	ND	--	<3.11	<3.11	<3.11	<3.11	2.84J	1.19J
S201-MW02R	ND	ND	--	ND	--	<3.11	<3.11	<3.11	<3.11	6.82	1.48J
S109-PZ01	--	--	--	--	--	--	--	--	--	--	--
S109-PZ02	--	--	--	--	--	--	--	--	--	--	--
S109-MW05D	--	--	--	--	--	--	--	--	--	--	--
S109-MW06	ND	ND	ND	ND	--	<3.11	<3.11	<3.11	<3.11	<0.658	<0.658
S109-MW07	--	--	--	--	--	--	--	--	--	<0.658	1.49J
S108-MW05	ND	ND	ND	ND	--	<3.11	<3.11	<3.11	<3.11	2.16J	1.18J
S108-MW06D	--	--	--	--	--	--	--	--	--	--	--
S108-MW03	ND	ND	ND	ND	0.53J	<3.11	<3.11	<3.11	<3.11	12.4	<0.658
S101-MW01R	ND	--	ND	ND	--	--	<3.11	<3.11	<3.11	2.18J	<0.658
S108-MW04	ND	ND	ND	ND	1.4J	<3.11	<3.11	<3.11	<3.11	9.85	1.53J
S108-PZ01	--	--	--	--	--	--	--	--	--	--	--
S108-PZ02	--	--	--	--	--	--	--	--	--	--	--
S105-MW01	ND	ND	ND	ND	--	<3.11	10.8	<3.11	<3.11	<0.658	<0.658
S107-MW02	ND	ND	ND	ND	--	<3.11	<3.11	<3.11	<3.11	<0.658	<0.658
S107-PZ01	--	--	--	--	--	--	--	--	--	--	--
S100-MW01	--	--	--	--	--	--	--	--	--	--	--

-- Not Sampled
 ND - Nondetect
 J - Estimated Result in ug/L
¹The value 3.11 is the MDL for bis (2-ethylhexyl) phthalate
²The MDL for bis(2-ethylhexyl)phthalate is 0.822 or 0.658
 Notes: MCL for bis(2-ethylhexyl)phthalate is 6 ug/L
 PQLs and MDLs are unknown for Franklin Steel Data provided prior to 2006

Data included in this table prior to 2006 provided by SAIC
 Data from 5/5/06 to 1/9/2006 provided by Burgess and Niple
 Data since 5/22/08 provided by RMT Inc.
 All values reported in ug/L

**TABLE 3. SVOC AND PAH PARAMETERS DETECTED
JWSD WELLS MW-1S AND MW-3S
5/09 AND 10/09 FRANKLIN STEEL SAMPLING EVENTS**

Well No.	Parameter	Units	MDL	PQL	Result
May 2009 Event					
MW-1S	Chrysene	ug/L	0.0135	0.100	0.080J
MW-3S	Chrysene	ug/L	0.0168	0.125	0.112J
	Fluoranthene	ug/L	0.02	0.125	0.125J
	Naphthalene	ug/L	0.0625	0.125	0.100J
October 2009 Event					
MW-1S	Butyl benzyl phthalate	ug/L	0.970	10.0	1.20J
MW-3S	Butyl benzyl phthalate	ug/L	0.970	10.0	1.21J

**TABLE 4. SCREEN DEPTH INFORMATION
TAYLOR ROAD WELL FIELD AND
FRANKLIN STEEL MONITORING SYSTEMS**

Well No.	Production Well Screen Interval (feet, TOC, MSL)	Bottom of Screen Elevation (feet, TOC, MSL)
Taylor Road Well Field		
WSW-1	859.4 - 841.4	841.4
WSW-2	860.9 - 845.9	845.9
WSW-3	844.7 - 824.7	824.7
MW-1S	--	877.9
MW-1DR	--	844.6
MW-2S	--	877.6
MW-2D	--	853.2
MW-3S	--	877.1
MW-3D	--	852.3
Franklin Steel		
S107-MW02	--	888.4
S108-PZ02	--	878.0
S105-MW01	--	880.9
S108-PZ01	--	881.7
S108-MW03	--	881.2
S108-MW04	--	881.3
S101-MW01R	--	880.6
S108-MW06D	--	843.8
S108-MW05	--	871.0
S109-MW06	--	880.5
S109-PZ01	--	878.2
S109-MW05D	--	849.4
S109-PZ02	--	879.4
S109-PZ04	--	unknown
S201-MW02R	--	880.1
S201-PZ01	--	879.2
S109-MW07	--	881.21