THIRD FIVE-YEAR REVIEW REPORT FOR RALSTON SUPERFUND SITE LINN COUNTY, IOWA

Prepared by

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Region 7
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6-29-14
Date

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LIST OF ABBREVIATIONS & ACRONYMS

µg/L	Microgram per Liter
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DCE	Dichloroethene
DVE	Dual Vapor Extraction
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
FYR	Five-Year Review
IC	Institutional Control
IDNR	Iowa Department of Natural Resources
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SLERA	Screening-Level Ecological Risk Assessment
TBC	To Be Considereds
TCE	Trichloroethene
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the third FYR for the Ralston Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

The Site consists of a single operable unit (OU) and is the subject of this FYR.

The Ralston Superfund Site FYR was led by Diana Engeman, EPA Remedial Project Manager (RPM). Participants included Jessica Kidwell, EPA Hydrogeologist; Catherine Wooster-Brown, EPA Ecological Risk Assessor; Ann Jacobs, EPA Human Health Risk Assessor; Pamela Houston, EPA Community Engagement Specialist; James Stevens, EPA Attorney; and Hylton Jackson, Iowa Department of Natural Resources (IDNR) Project Manager. The Iowa Department of Natural Resources and Rockwell Collins, Inc. were notified of the initiation of the five-year review. The review began on June 24, 2015.

Refer to Appendix A for a Reference List of documents used in the preparation of this report.

Site Background

The Ralston site is located north of 228 Blairs Ferry Road NE, just south of Dry Run Creek, and about ½ mile east of C Avenue on the north side of Cedar Rapids, Linn County, Iowa. Figure 1 shows the location of the site. From 1956 to 1958, a waste contractor disposed of industrial wastes on his property. The contractor collected these wastes from Collins Radio Company and other local businesses. Rockwell Collins, Inc. is the successor to Collins Radio Company. Solvents and other debris were burned at the site and small containers of cyanide wastes were encapsulated in concrete and buried.

The disposal area occupies 1.5 acres and is enclosed with a fence with a locked gate. The southern bank of Dry Run Creek forms the northern boundary of the disposal area. Figure 2 is a site map showing the location of the disposal area and monitoring wells. Rockwell Collins owns the disposal area and surrounding acreage. The area immediately surrounding the disposal area is zoned for residential/agricultural use. There is a walking/biking trail and commercial properties within 500 feet of the disposal area to the south. They are separated from the disposal area by a steep, heavily vegetated embankment. Residential developments exist north and west of the disposal area. These developments have reached the property owned by Rockwell Collins. It is possible that there will be further commercial and residential development in areas outside of the disposal area.

Several private and public water supply wells exist from within less than 1000 feet to approximately one mile from the disposal area. Four private wells exist within one mile of the site and are sampled annually. The city of Marion utilizes one well which taps the Silurian aquifer approximately one mile east of the Ralston site.

Detailed background information on the site is available in the 1997 Remedial Investigation Report. This report included a site conceptual model.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Ralston		
EPA ID: IAD980632491		
Region: 7	State: IA	City/County: Cedar Rapids/Linn
SITE STATUS		
NPL Status: Non-NPL		
Multiple OUs? No	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Diana Engeman		
Author affiliation: EPA		
Review period: 6/24/2015 - 6/1/2016		
Date of site inspection: 4/26/2016		
Type of review: Statutory		
Review number: 3		
Triggering action date: 6/30/2011		
Due date *(five years after triggering action date)*: 6/30/2016		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In December 1981, Rockwell Collins submitted a CERCLA section 103(c) notice to the EPA, which listed hazardous substances disposed at the Ralston site as solvents, paint sludge and buried drums of concrete-encapsulated cyanide. In that notice, Rockwell Collins estimated that 60,000 gallons of liquid wastes were generated and disposed during the years of its plating operation, and an undetermined number of concrete-encapsulated cyanide drums were buried at the site. Pre-remedial assessments and investigations conducted from 1985 through the mid-1990s detected volatile organic compounds (VOCs) and metals in soils; VOCs in shallow and bedrock groundwater, including a private water supply well; and low levels of VOCs in creek surface water and sediment.

In 1994, a baseline human health and ecological risk assessment was conducted as a part of the remedial investigation. Human exposures to contaminated surface soil, groundwater, sediment and surface water were evaluated in the baseline risk assessment. However, due to the subsequent implementation of removal actions and institutional and engineering controls, the only exposure pathways considered viable at the time of the 1999 Record of Decision (ROD) involved exposure to groundwater through ingestion or inhalation of vapors during household use by a resident. In the ROD, the following VOCs were identified as contaminants of concern (COCs) for groundwater: benzene; 1,1-dichlorothene (1,1-DCE); cis-1,2-dichloroethene (cis-1,1-DCE); trichloroethene (TCE); and vinyl chloride.

Although the baseline risk assessment identified potential ecological risks to site vegetation, the terrestrial food web, and the aquatic life in Dry Run Creek, the ROD noted that subsequent removal actions had significantly reduced or eliminated these risks.

Response Actions

Pre-ROD response actions at the site included preliminary assessment and site investigation activities completed under the EPA's pre-remedial program, as well as voluntary actions by Rockwell Collins. In 1989, Rockwell Collins removed and properly disposed of two drums of concrete-encapsulated cyanide. No other drums were located.

On December 4, 1991, Rockwell Collins and the EPA, entered into an Administrative Order on Consent (AOC) to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the site. While Rockwell Collins was completing the RI/FS, they entered into a second AOC, dated January 22, 1993, to conduct a removal site evaluation, engineering evaluation/cost analysis and a removal action to accelerate the cleanup of the disposal area and shallow groundwater. The removal actions implemented at the Ralston site included the following:

- Capping of the former disposal area;
- Stabilization of the bank of Dry Run Creek to prevent erosion;

- Installation and operation of a dual vapor extraction (DVE) and treatment system; and
- Extraction and treatment of alluvial groundwater located north of Dry Run Creek.

Capping of the disposal area and stabilization of the creek bank were completed in December 1995. Figure 3 shows the location of the disposal area cap and creek bank stabilization. The DVE system began full-time operation in April 1995 and operated periodically until June 1997. At that time, it was determined that it was no longer effectively removing additional source contamination. More than 4,800 pounds of VOCs were removed and treated with the DVE and treatment system.

The ROD for the site was signed on September 30, 1999. Remedial action objectives (RAOs) were developed for soil and groundwater.

- The RAO for soil was the prevention or minimization of direct contact exposures (inhalation, dermal contact, ingestion, etc.) with soil having a carcinogenic risk in excess of $1x10^{-4}$ or a hazard index for noncarcinogens greater than one. Specific soil cleanup criteria were not established in the ROD because the removal actions had eliminated exposure to soil which exceeded these threshold levels.
- The RAO for groundwater was to prevent exposure to ground water containing contaminants that represent an unacceptable risk to human health or the environment; to contain the contaminated ground water plume; to restore the ground water to drinking water quality outside of the disposal area; and to maintain site conditions which prevent exposure to residual soil contaminants that could pose an unacceptable risk to human health or the environment. This RAO was further described to prevent ingestion of or direct contact with groundwater having a carcinogenic risk in excess of $1x10^{-4}$ and/or a hazard index for noncarcinogens greater than one.

The selected remedy included:

- Monitored natural attenuation of groundwater;
- Continued ownership of the fenced-in area, including the disposal area;
- Continued listing of the site on the Registry of Hazardous Waste or Hazardous Substance Disposal Sites pursuant to Iowa Administrative Code 455B.426;
- Continued designation of a protected ground water source area surrounding the site pursuant to Iowa Administrative Code 567-53.7(455B);
- Maintenance of the disposal area cap; and
- Maintenance of the Dry Run Creek bank stabilization.

The EPA's Maximum Contaminant Levels (MCLs) for public water supplies from the Safe Drinking Water Act were identified as applicable or relevant and appropriate requirements (ARARs) for this site. The cleanup levels for groundwater at the site were the MCLs, expressed in micrograms per liter (µg/l), which are as follows:

Table 1: Groundwater Cleanup Levels

Contaminant	MCL, in μg/L
Benzene	5
1,1-Dichloroethene	7
Cis-1,2-Dichloroethene	70
Trichloroethene	5
Vinyl chloride	2

It was noted in the ROD that achieving MCLs in the disposal area might not be possible due to the likelihood that contaminants are present in that area as a dense nonaqueous phase liquid. In the future, if it is determined that MCLs cannot be achieved in the disposal area, it may be appropriate to consider a technical impracticability waiver.

Refer to Appendix B for a Chronology of Site Events.

Status of Implementation

On July 20, 2000, the EPA and IDNR entered into an agreement entitled "Response Action Oversight and NPL Deferral Agreement for the Ralston Superfund Site, Cedar Rapids, Iowa." Pursuant to this agreement, IDNR agreed to assume responsibility for oversight of the response actions at the Ralston site and implementation of the ROD. Further, the EPA agreed to defer consideration of listing the Ralston site on the National Priorities List (NPL) and, when the response actions are complete, to no longer consider the site for the NPL unless new information suggests the existence of a significant threat to human health or the environment.

On July 24, 2000, IDNR entered into Consent Order No. 00-HC-05 with Rockwell Collins in which Rockwell Collins agreed to perform the work prescribed in the ROD under the oversight of the IDNR.

From 2001 through 2013, groundwater monitoring was conducted in 19 monitoring wells and four private wells. In 2013, monitoring wells MW-10B and MW-11B were installed and added to the monitoring network. The locations of the monitoring wells are shown in Figure 2. Monitoring wells in five geologic zones, both on-site and downgradient of the disposal area, have been sampled.

- Alluvial wells: MW-1A, MW-2A, MW-3A and MW-4A
- Devonian bedrock wells: MW-1B, MW-2B, MW-3B, MW-4B, MW-9B, MW-10B and MW-11B
- Silurian bedrock wells in three zones, from shallowest to deepest:
  - Upper Scotch Grove formation wells: MW-1C, MW-3C and MW-4C
  - Lower Scotch Grove formation wells: MW-1D, MW-3D, MW-5D, MW-7D, MW-8D and MW-9D
  - Hopkinton formation well: MW-3E

These monitoring wells have been sampled semiannually in April and October, from 2001 through 2005, and annually from April 2006 to the present.

The two private wells closest to the site have been sampled semiannually in April and October since 2001. The other two private wells have been sampled annually in April of each year since 2001.

The disposal area cap and the creek bank stabilization were inspected and maintained quarterly from 2001 through 2005. Since 2006, this inspection and maintenance has occurred semiannually. Sediment and surface water samples were collected from Dry Run Creek in 2013.

All institutional controls identified in the ROD have been implemented and include:

1) Continued ownership by Rockwell Collins of the fenced area, including the disposal area. The area is zoned for residential/agricultural use. The only access to the disposal area is through a locked gate, thus restricting access by trespassers.

2) Listing of the site on the Registry of Hazardous Waste or Hazardous Substance Disposal Sites pursuant to Iowa Administrative Code 455B.426. Pursuant to Subrule 567, Iowa Administrative Code 148.6(5), written approval of the director of the IDNR is required prior to any substantial change in the use of the listed site. In addition, written approval is required to sell, convey or transfer title of the listed site.

3) A one-mile area surrounding the site has been designated as a protected water source pursuant to Rule 567 Iowa Administrative Code 53.7(1)(455B). According to the promulgated rule: any new application for a permit to withdraw groundwater or to increase an existing permitted withdrawal of groundwater from within the protected water source area will be restricted or denied, if necessary, to preserve public health and welfare or to minimize movement of groundwater contaminants from the Ralston site. The IDNR coordinates with the Linn County Health Department, the local well permitting authority, to enforce this institutional control.

Figure 4 shows the area designated as protected water source area for the Ralston site.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last five-year review as well as the recommendations from the last five-year review and the current status of those recommendations.

Table 2: Sitewide Protectiveness Determination/Statement from the 2011 FYR

Protectiveness Determination	Protectiveness Statement
Protectiveness Deferred	A protectiveness determination for the remedy at the Ralston site cannot be made until further information is obtained. Further information will be obtained by conducting a vapor intrusion study and collecting and evaluating sediment and surface water data from Dry Run Creek. It is expected that this evaluation will take approximately two years to complete, at which time a protectiveness determination may be made.

Table 3: Status of Recommendations from the 2011 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
It is not clearly demonstrated that the extent of contamination has been defined to the east of MW-3B or MW-9B in the Devonian aquifer.	Take actions, possibly including installation of monitoring wells to define the extent of groundwater contamination to the east in the Devonian aquifer.	Completed	Two monitoring wells were installed in the Devonian aquifer and site COCs were not detected in these wells.	9/18/2013
The vapor intrusion exposure pathway has not been evaluated.	Evaluate potential for vapor intrusion utilizing multiple lines of evidence.	Completed	Evaluation was completed and it was determined that the potential for off-site vapor intrusion did not exist.	9/18/2013
The sediments and surface water of Dry Run Creek have not been sampled since prior to the ROD.	Sample sediments and surface water of Dry Run Creek and amend operations and maintenance (O&M) Plan to include periodic sampling.	Ongoing	Sediment and surface water was sampled and concentrations of site contaminants detected did not pose an unacceptable ecological risk. It does not appear that the O&M Plan was amended or that periodic sampling continues to occur Modification of the O&M Plan to include this monitoring will be included in this FYR	9/18/2013
Listing on the state Registry of Hazardous Waste or Hazardous Substance Disposal Sites is not as enforceable as an environmental covenant.	Implement Uniform Environmental Covenant on the site property.	Considered But Not Implemented	Property owner, Rockwell Collins, declined to implement an environmental covenant on the site property.	N/A

Since a protectiveness determination was deferred in the 2011 FYR, the FYR was addended after sufficient information was gathered to address the issues where the data had been insufficient to make a protectiveness determination. The EPA issued a FYR Addendum, dated December 13, 2013, with the following sitewide protectiveness statement.

Table 4: Sitewide Protectiveness Determination/Statement from the 2013 FYR Addendum

Protectiveness Determination	Protectiveness Statement
Short-term Protective	The remedy at the Ralston site is protective of human health and the environment in the short-term. In order to be protective in the long-term, the EPA will continue to pursue implementation of a Uniform Environmental Covenant on the Rockwell property.

The EPA is continuing to pursue implementation of a Uniform Environmental Covenant on the Rockwell Collins property.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification and Involvement

A public notice was made available by a display ad in The Gazette on January 17, 2016, stating that the EPA was conducting a five-year review and inviting the public to submit any comments to the EPA. The EPA did not receive any comments from the public. The results of the review and the report will be made available to the public.

Data Review

Since 2011, nineteen groundwater monitoring wells have been sampled annually, and in 2013, two additional monitoring wells were installed in response to recommendations made in the 2011 FYR. They have been sampled annually since that time. Water level measurements are taken annually in all of the monitoring wells sampled, as well as one additional well, during each sampling event to assess groundwater flow direction. Appendix C contains a table of monitoring well analytical results since 1992. All data are presented annually in Remedial Action Activity Reports.

The A-series monitoring wells are in the unconsolidated Quarternary alluvium of Dry Run Creek, with the flow direction from the disposal area predominantly to the northeast, toward the creek. COCs at concentrations exceeding MCLs the alluvium groundwater (MW-1A and MW-3A) are within the footprint of the fenced disposal area. The 1997 RI Report indicates that groundwater flow direction in the Quaternary alluvium is variable due to interaction with surface water in Dry Run Creek, with flow generally to the northeast in the disposal area south of the creek and radially south in the floodplain peninsula north of the creek. This was confirmed in the 2015 Remedial Action Activity Report. The plume is bounded horizontally by MW-2A (northwest), MW-4A (northeast), and Dry Run Creek (multiple surface water and sediment sampling locations), and vertically by deeper wells in the MW-1 and MW-3 well clusters.

Historically, the well upgradient of the disposal area, MW-1A, and the side gradient well, MW-2A, have shown significant decreases in contaminant concentrations, particularly for TCE and cis-1,2-DCE. TCE slightly exceeded the MCL in MW-1A, at 6.71 µg/L, in May 2015. No other contaminant in MW-1A exceeded an MCL during the past five years and all contaminants were below detection limits in MW-2A during the same time period. MW-3A, which is immediately downgradient of the disposal area, continues to be very heavily contaminated. MW-4A, which is further downgradient of the disposal area, is uncontaminated, with concentrations of all COCs below detection limits.

Previous investigations have demonstrated that discharge from the alluvium to Dry Run Creek at the Ralston site causes negligible impact to the creek. Surface water and sediment samples were collected during 2013, in response to recommendations made in the 2011 Five-Year Review. None of the COCs were detected in surface water or sediment samples above the detection limits during that sampling event. The surface water sampling location are shown in Figure 5. The sediment sampling locations are shown in Figure 6. Figure 5 shows that cadmium, copper and lead in surface water are below both chronic and acute National Ambient Water Quality Criteria. Figure 6 shows that cadmium, copper and lead in sediment are below the probable effect concentration. Further, concentrations of the other chemicals analyzed in the sediment (bromoform, carbon disulfide, chloroform, methylene chloride and naphthalene) are all below the EPA ecological screening levels in sediment. It does not appear that the O&M Plan has been modified to include surface water or sediment sampling, as recommended in the 2011 FYR, to determine whether these media have become impacted at some point in the future. This FYR recommends that surface water sediment sampling be included in the O&M Plan.

Monitoring results from the next deeper B-series monitoring wells in the Devonian bedrock aquifer have shown more variability. During the past five years, the flow direction in the Devonian aquifer was predominantly to the east northeast during 2011 and 2012, changing to the east and southeast in 2013 and then to the southeast in 2014 and 2015. During the 2011 FYR, it was noted that the flow direction in the Devonian aquifer had changed to the east northeast, which was a change in flow direction from the time the remedial investigation was conducted when the flow was primarily to the southeast. No explanation for these changes in flow direction has not been given in the annual reports.

COCs at concentrations exceeding MCLs in Devonian groundwater (MW-1B, MW-2B, MW-3B and MW-9B) are within and downgradient of the disposal area footprint. The plume is bounded horizontally by MW-4B (northeast), MW-10B (east), and MW-1B (southeast), and vertically by deeper wells in the MW-1, MW-3, and MW-9 well clusters.

MW-3B, which is the Devonian aquifer well immediately downgradient of the disposal area, remains heavily contaminated with all of the COCs and no discernable trends have been evident during the past five years. At MW-2B, which is side gradient or upgradient to the disposal area depending flow direction in the Devonian aquifer, the concentrations of all COCs except vinyl chloride have been very low or not detected during the past five years. The concentration of vinyl chloride in MW-2B has remained high, from 375 to 1590 μg/L. Contaminant levels in MW-9B, which is located about 500 feet southeast of the disposal area, have been more variable than the other Devonian wells. The concentrations of TCE, although detectable, have been below the MCL for the past five years. Concentrations of cis-1,2-DCE varied from 37.4 to 258 μg/l. The concentration of vinyl chloride has consistently been above the MCL of 2 μg/l, except in 2013 when is dipped to 1.99 μg/L. Cis-1,2-DCE and vinyl chloride are both daughter products of TCE degradation, indicative of natural attenuation of TCE, and have exhibited decreasing concentration trends. MW-10B and MW-11B were installed in

2013 to address recommendations made in the 2011 FYR and were sampled in 2013 through 2015. None of the COCs were detected in either well during these sampling events.

The C- and D-series monitoring wells are completed in the Upper and Lower Scotch Grove formation of the Silurian bedrock aquifer. Flow direction in the Scotch Grove formation has varied from southeasterly to southwesterly in the past five years with southwesterly flow being most frequently observed. COCs exceeding MCLs in the Silurian groundwater (MW-1C, MW-3C and MW-1D) are within the disposal area footprint. The plume is bounded horizontally by monitoring wells MW-8D (southwest), MW-5D (south), and MW-9D (south-southeast). However, given the separation of nearly 1,200 feet between monitoring wells MW-5D and MW-8D, horizontal delineation could be improved. The plume is bounded vertically by MW-3E (Hopkinton), which is directly upgradient of MW-1D.

In MW-1C, TCE and cis-1,2-DCE are the only COCs exceeding their respective MCLs during the past five years. The concentration of TCE in this well appears to be decreasing. MW-3C has continued to have high levels of cis-1,2-DCE, 1,1-DCE , vinyl chloride and benzene, with the benzene and cis-1,2 DCE concentrations decreasing. The only exceedance of an MCL in the D-series wells occurred in MW-1D. TCE was found in MW-1D at 14.3 μg/L in 2011 and 7.01 μg/L in 2012 but has remained below the MCL of 5 μg/L since that time.

One monitoring well is completed in the underlying Hopkinton formation of the Silurian bedrock aquifer. No contaminants of concern have been detected in this well, MW-3E, which is located near the disposal area. The 1997 RI Report demonstrates a very low horizontal gradient within the Silurian aquifer. Additionally, the RI Report indicates that the Lower Scotch Grove and Hopkinton are characterized by dense cherty and non-cherty dolomites whose capability to transmit groundwater is limited to fractures and secondary porosity. Little to no vertical gradient was demonstrated between the Lower Scotch Grove and Hopkinton, and these units are underlain by Maquoketa Shale.

Mean and trend tests were conducted for monitoring wells in which contaminant concentrations exceeded MCLs during the past five years. Groundwater data from the past eight annual monitoring events (Spring 2008 to Spring 2015) were evaluated using the EPA Groundwater Statistics Tool.

Table 5: Groundwater Mean and Trend Test Results

<table>
<tr><th></th><th></th><th></th><th>May 2015 Ground-water Result (µg/L)</th><th>95% Upper Confidence Limit on the Mean (µg/L)</th><th>Trend</th><th>95% Upper Confidence Band on the Trend Line (µg/L)</th><th>EPA MCL (µg/L)</th></tr>
<tr><td rowspan="6">Quaternary</td><td>MW-1A</td><td>TCE</td><td>6.71</td><td>7.79</td><td>none</td><td>7.5</td><td>5</td></tr>
<tr><td rowspan="5">MW-3A</td><td>TCE</td><td>873</td><td>5,000</td><td>none</td><td>2260</td><td>5</td></tr>
<tr><td>1,1-DCE</td><td>63.7</td><td>211</td><td>decrease</td><td>194</td><td>7</td></tr>
<tr><td>cis-1,2-DCE</td><td>8530</td><td>21,700</td><td>decrease</td><td>12300</td><td>70</td></tr>
<tr><td>trans-1,2-DCE</td><td>93.9</td><td>225</td><td>none</td><td>277</td><td>100</td></tr>
<tr><td>vinyl chloride</td><td>629</td><td>841</td><td>none</td><td>898</td><td>2</td></tr>
<tr><td rowspan="9">Devonian</td><td>MW-1B</td><td>TCE</td><td>21.2</td><td>20.2</td><td>increase</td><td>30.2</td><td>5</td></tr>
<tr><td>MW-2B</td><td>vinyl chloride</td><td>956</td><td>1,339</td><td>increase</td><td>1480</td><td>2</td></tr>
<tr><td rowspan="5">MW-3B</td><td>TCE</td><td>155</td><td>299</td><td>none</td><td>323</td><td>5</td></tr>
<tr><td>cis-1,2-DCE</td><td>6,080</td><td>6,250</td><td>none</td><td>7040</td><td>70</td></tr>
<tr><td>1,1-DCE</td><td>132</td><td>162</td><td>none</td><td>213</td><td>7</td></tr>
<tr><td>vinyl chloride</td><td>2,250</td><td>2,350</td><td>none</td><td>3000</td><td>2</td></tr>
<tr><td>benzene</td><td>14.6</td><td>16.7</td><td>none</td><td>19.6</td><td>5</td></tr>
<tr><td rowspan="2">MW-9B</td><td>cis-1,2-DCE</td><td>151</td><td>300</td><td>decrease</td><td>206</td><td>70</td></tr>
<tr><td>vinyl chloride</td><td>3.02</td><td>18.2</td><td>decrease</td><td>13</td><td>2</td></tr>
<tr><td rowspan="8">Silurian</td><td rowspan="2">MW-1C</td><td>TCE</td><td>36.9</td><td>48.6</td><td>decrease</td><td>41.4</td><td>5</td></tr>
<tr><td>cis-1,2-DCE</td><td>303</td><td>318</td><td>none</td><td>332</td><td>70</td></tr>
<tr><td rowspan="5">MW-3C</td><td>1,1-DCE</td><td>303</td><td>354</td><td>none</td><td>390</td><td>7</td></tr>
<tr><td>cis-1,2-DCE</td><td>27,900</td><td>32,800</td><td>decrease</td><td>29200</td><td>70</td></tr>
<tr><td>trans-1,2-DCE</td><td>180</td><td>240</td><td>increase</td><td>289</td><td>100</td></tr>
<tr><td>vinyl chloride</td><td>6,050</td><td>7,780</td><td>none</td><td>7600</td><td>2</td></tr>
<tr><td>benzene</td><td>78.3</td><td>112</td><td>decrease</td><td>75.6</td><td>5</td></tr>
<tr><td>MW-1D</td><td>TCE</td><td>3.58</td><td>20.5</td><td>decrease</td><td>4.93</td><td>5</td></tr>
</table>

Shaded cells indicate an increasing concentration trend.

Although concentrations at the 95% upper confidence limit exceeded EPA MCLs for all of the wells and contaminants below, concentration trends were generally flat or decreasing with three exceptions:

- Concentrations of TCE in Devonian well MW-1B (range 5.92 to 26.8 µg/L) showed an increasing trend. Well MW-1B is within the disposal area footprint and likely reflects a slight shift in the plume distribution and/or the presence of continued source material in the disposal area. TCE concentration trends are stable or decreasing in neighboring and deeper wells.
- Concentrations of vinyl chloride in Devonian well MW-2B (range 298 to 1,590 µg/L) showed an increasing trend. Well MW-2B is within the northwestern corner of the disposal area footprint. Vinyl chloride is likely a daughter product of TCE degradation in the disposal area.
- Concentrations of trans-1,2-DCE in Silurian well MW-3C (range 54.4 to 219 µg/L) showed an increasing trend. Well MW-3C is within the footprint of the fenced disposal area, on the north side of Dry Run Creek. The trans-1,2-DCE is likely a daughter product of TCE degradation in the disposal area.

In addition to sampling monitoring wells for the contaminants of concern, the wells are sampled every five years for the following natural attenuation parameters: nitrate as nitrogen, sulfate, total organic carbon, methane, ethene, ethane, dissolved iron and dissolved manganese. These parameters, in addition to the well stabilization parameters measured every time a well is sampled, are indicators that conditions in the subsurface are favorable for intrinsic bioremediation to occur or that it has taken place. This information, as well as contaminant concentrations and other hydrogeologic information, can be used to assess whether intrinsic bioremediation is occurring and, if so, at what rate it might be expected to occur. The 2015 Remedial Annual Action Activity Report includes the most recent analysis of the natural attenuation data. The limited discussion provided in that report concludes that reductive dechlorination is occurring and that the pH and dissolved oxygen measurements, as well as total organic carbon and electron donor data, indicate the environment is conducive to supporting biodegradation processes. There is no information provided regarding whether the natural attenuation flow path in the conceptual site model developed during the FS is still appropriate or natural attenuation is occurring at the rate predicted in the model.

Four private wells have been sampled since April 2001. One well that is sampled semiannually had vinyl chloride detected at 1.22 μg/L in October 2014. No other detectable contamination that might be associated with the Ralston site has been detected in any of these wells during the past five years.

Site Inspection

The inspection of the site was conducted on April 26, 2016. In attendance were Diana Engeman, Remedial Project Manager, EPA; Pamela Houston, Community Engagement Specialist, EPA; Hylton Jackson, Project Manager, IDNR; Tom Gentner, Director, Environmental, Safety and Health, Rockwell Collins; and Steve Varsa, Project Manager, MWH. The purpose of the inspection was to assess the protectiveness of the remedy. Appendix D is the completed Site Inspection Form.

The disposal area cap and creek bank cable-mat were in good condition, with no trees growing in either area. The disposal area fence was in excellent condition with the gate locked. All monitoring wells that were observed were in good condition with locked caps. The use of the property including and surrounding the site that is owned by Rockwell Collins has not changed and they limit access by placing locked gates at each of the entrances where vehicles could enter the property. There is no evidence that people have been circumventing the gates to enter with any type of vehicle.

We observed the location of the off-site well identified as the Findley well, which is under new ownership. It appears that a landscaping business is in operation on the property and could be using the well to fill a water tank. Representatives with IDNR will contact the property owner to ensure they are aware of the requirements of the Protected Water Source Area for the Ralston site.

We also observed the location of Marion City Well 1, which is within the one-mile radius of the Protected Water Source Area.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:
The remedy is functioning as intended by the ROD. The cap covering the disposal area prevents direct contact with waste beneath the cap. The stabilization of the bank of Dry Run Creek is successful at preventing erosion and continued maintenance of the creek bank and the cap ensure that they remain in good condition. Groundwater monitoring ensures that the extent of contaminated groundwater is known both vertically and horizontally. It has been demonstrated that the plume is stable and natural attenuation of the contaminants in groundwater is occurring. The institutional controls described in the ROD have been implemented and are effective.

Remedial Action Performance
Groundwater monitoring indicates that the groundwater contamination plume is vertically and horizontally contained within the established network of 21 monitoring wells and four private wells. As described in previous sections, monitoring parameters and contaminant concentration trends generally indicate that natural attenuation is occurring.

Natural attenuation monitoring parameters coupled with contaminant concentration information generally demonstrate that natural attenuation is occurring and conditions are favorable for it to continue to occur. There is no indication that these data have been used to update the conceptual site model, which was included in the Feasibility Study Report, to predict whether natural attenuation is occurring at the rate predicted in the model. This would provide useful information for determining when groundwater cleanup levels will be achieved

Vigilance is necessary in light of the potential for dense non-aqueous phase liquids to be present at the site, the preferential pathways identified during the RI in the upper carbonate bedrock, and the possibility of outside influences affecting plume distribution, such as increased groundwater extraction within the site Protected Water Source Area. Any permitted increase in groundwater extraction within, or affecting hydraulic conditions within, the site Protected Water Source Area should be calculated and verified not to influence the distribution of the groundwater contamination plume.

The cap covering the disposal area prevents direct contact with waste beneath the cap. The fence and locked gate around the disposal area further prevent contact with waste and damage to the cap. The condition of the cap is monitored and repairs are made as necessary. The stabilization of the bank of Dry Run Creek is successful at preventing erosion and continued maintenance of the area that has been stabilized ensures that the concrete-cabled mat remains in good condition.

Surface water and sediment sampling conducted in 2013 indicated that contamination has not migrated from the groundwater to these media. This sampling was conducted in response to a recommendation in the 2011 FYR. However, that recommendation also stated that the O&M Plan should be amended to include periodic sampling of these media and it does not appear that this has been done.

The institutional controls that were described in the ROD have been implemented and have been effective. They are discussed more thoroughly later in this section. The implementation of the environmental covenant that was recommended in the 2011 FYR has not taken place.

System Operations/O&M

Since this remedy does not involve active remediation, operation and maintenance are minimal and are limited to maintenance of the disposal area cap and creek bank stabilization, and ensuring the integrity of the monitoring wells. During the past five years, inspection and routine maintenance of the cap and creek bank have occurred as specified in the Remedial Action Implementation Work Plan. Monitoring wells have been maintained. There are no changes in the current processes needed in the future.

Implementation of Institutional Controls and Other Measures

The institutional controls listed in the ROD were:

- Continued ownership by Rockwell Collins of the fenced area, including the disposal area.
- Listing of the site on the Registry pursuant to Iowa Administrative Code 455B.426. Pursuant to Subrule 567, Iowa Administrative Code 148.6(5), written approval of the director of the IDNR is required prior to any substantial change in the use of the listed site. In addition, written approval is also required to sell, convey or transfer title of the listed site.
- Designation of a 1-mile area surrounding the site as a protected water source area pursuant to Rule 567 Iowa Administrative Code 53.7(455B). According to the promulgated rule: any new application for a permit to withdraw groundwater or to increase an existing permitted withdrawal of groundwater from within the protected water source area will be restricted or denied, if necessary, to preserve public health and welfare or to minimize movement of groundwater contaminants from the Ralston Site. The IDNR coordinates with the Linn County Health Department, the local well permitting authority, to enforce this institutional control.

Rockwell Collins continues to own the site property and includes a statement in each annual report that they will continue to own the property and there will be no change in use of the property. The site continues to be listed on the Registry of Hazardous Waste or Hazardous Substance Disposal Sites. In the 2011 FYR, one of the recommendations was to implement a Uniform Environmental Covenant on the site property, as this is a more enforceable form of land use control than Rockwell Collins' ownership of the property and listing on the Registry. Rockwell Collins declined to implement the EPA's recommendation in the 2011 FYR to place a covenant on the site; therefore, it was determined that the remedy was protective in the short-term. The EPA continues implementation of the site covenant.

The protected water source area is an important element of the remedy. This rule, commonly referred to as "Chapter 53", allows the state to designate a specific source of water as a protected source to ensure long-term availability in terms of quantity and quality to preserve public health and welfare. The purpose of the rule at section 53.3(2) is "to prevent or minimize the movement of groundwater contamination." It was discovered during this five-year review that the city of Marion, Iowa, is exploring options for expanding drinking water source capcity. One option would be to utilize City Well 1 continously, rather than only using this well during periods of high demand. This well is within the one-mile radius of the protected water source area designated for this site. Figure 4 shows the location of City Well 1. IDNR is currently working with the city of Marion to determine how to resolve the city's needs for increased water capacity consistent with the requirements of Chapter 53. The protected water source area rule is functioning as intended.

It was also discovered during the October 2015 private well sampling event that the property where the well identified as the Finley well is located was under new ownership. That well is also within the protected water source area, less than 1000 feet from the disposal area. The new property owner told Rockwell Collins' consultant that they planned to continue to use the well on the property and would likely increase its usage. During the site inspection for the five-year review, it appeared that the new owner is currently operating their business at that property and are likely using that well. The IDNR project manager is aware of this situation and will be determining whether any actions need to be taken pursuant to Chapter 53. Currently it is unknown what effect increased use of this well may have on the groundwater plume at the site and the protectiveness of the remedy. There has not been any contamination detected in this well during the past five years.

The area the disposal area that was capped is surrounded by a chain-link fence with a locked gate to prevent trespassers from entering the area and disturbing the cap. The fence and gate are well maintained and there is no evidence of trespassing. Areas where vehicles could enter the property surrounding the site are also blocked by locked gates. This prevents trespassers from driving onto the property. There is no evidence that vehicles are entering the property.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

The RAOs in the ROD remain valid. There have not been any changes to the groundwater cleanup levels established in the ROD. There have been numerous changes to toxicity values and human health risk assessment methodology since the ROD but none of these changes have adversely affected the protectiveness of the remedy. The ecological risk assessment methodology has changed in the assessment was conducted for this site but the changes have not adversely affected the protectiveness of the remedy. Vapor intrusion was not considered as a potential exposure pathway prior to selection of the remedy in the ROD but this pathway was assessed following completion of the 2011 FYR and found to be an incomplete exposure pathway. 1,4-Dioxane has been identified as a new, potential contaminant at the site that may affect the protectiveness of the remedy. It will be necessary to determine whether it is present in groundwater at the site to make a protectiveness determination.

Changes in Standards and To Be Considereds (TBCs)

In the ROD, cleanup levels were established for groundwater but not for soil, because contaminated soil from the disposal area was capped with two feet of compacted clay and two feet of soil, eliminating direct contact exposure. The groundwater cleanup levels were based on the Federal MCLs and they have not changed for any of the COCs since the ROD was signed. There are no newly promulgated standards that apply to the site. TBCs were not used in selecting cleanup levels for this site.

Changes in Toxicity and Other Contaminant Characteristics

Numerous toxicity values have changed since the baseline human health risk assessment was completed in October 1994. These changes have no impact on the remedy for soil because direct contact has been eliminated through a clay and soil cap. No one is currently using the contaminated groundwater as a domestic source and the remedy prevents future exposure because a one-mile area surrounding the site has been designated as a protected water source area pursuant to Iowa Administrative Code 567-53.7(455B) and any new wells in the designated area must be approved by state authorities. Toxicity factors have changed for TCE and significantly impact risks due to vapor intrusion exposure when that pathway is complete. That exposure pathway is not complete at this site. Thus, these changes do not impact the protectiveness of the remedy for soil, groundwater and indoor air.

There have not been any changes to the toxicity factors or other contaminant characteristics that affect the protectiveness of the remedy for ecological receptors at the site.

Changes in Risk Assessment Methods

The overall approach that was used for conducting this human health risk assessment was comparable to current risk assessment practices. Current methodology quantifies dermal contact with contaminated water while showering and bathing, which was not done in this human health risk assessment. Also, the EPA has more recent guidance on quantifying exposure for both the dermal and inhalation routes of exposure. Furthermore, some of the exposure parameters utilized in the human health risk assessment for this site are different than values currently used (i.e., skin surface area, inhalation rate). Overall, these changes do not have a significant impact on the conclusions of the risk assessment nor do they affect the protectiveness of the remedy.

The 1994 Ecological Risk Assessment (ERA) for the site was adequate. In 1997, the EPA published Interim Final Ecological Risk Assessment Guidance for Superfund. Although the ERA for the site was referred to as a baseline risk assessment, it was actually a screening level ERA (SLERA). A SLERA was the appropriate action to take at the Ralston site. The ERA is still considered adequate because it contained all three steps in the 1997 guidance. Confirmed ecological risks and potential ecological risks were found at the site via the assessment that was performed. The next step in conducting an ERA, as described in the 1997 ERA guidance, would have been to conduct a baseline ERA, bringing unknown and known COCs forward and performing a more in-depth ERA. Rather than going through this process at the Ralston site, the creek bank was stabilized with a geomembrane underneath, a creek crossing was installed, and the disposal area was capped. Samples collected from surface water and sediment confirm that no unacceptable ecological risks are occurring at the site.

Changes in Exposure Pathways

Land use has not changed at the site. The former railroad tracks to the south of the site is now Lindale Trail, a multi-use recreational trail. There is no known or anticipated exposure to site contaminants associated with use of this trail. The property where the well known as the Finley well is located was sold recently and is being used for commercial purposes. This property is located approximately 900 feet south of the disposal area. The new property owner has indicated their plans to use water from the well on the property for drip irrigation.

In the 2011 FYR, subsurface vapor intrusion was identified as a potential exposure pathway which had not been previously evaluated at this site. In the Addendum to the Second Five-Year Review Report, dated December 13, 2013, it was documented that this issue was resolved through a multiple-lines-of-evidence evaluation of the vapor intrusion pathway. It was concluded that outside of the property owned by Rockwell Collins, where future development will not be permitted by the owner, the vapor intrusion pathway was incomplete, and therefore, exposure is unlikely to occur and result in indoor air exceeding a target cancer risk of 1×10^{-6} or a noncancer health index greater than one.

The human health risk assessment did not account for dermal contact with contaminated groundwater by current and future residential receptors. However, inclusion of this pathway would not affect the protectiveness of the remedy because no individuals are using contaminated groundwater and installation of new wells is protected within one mile of the source area.

1,4-Dioxane has been identified as a new, potential contaminant at the site that may affect the protectiveness of the remedy. 1,4-Dioxane was used as a stabilizer in some chlorinated solvents, including TCE, a COC for this site. None of the sampling conducted as the site has included analysis for 1,4-dioxane. 1,4-Dioxane is known to migrate rapidly in groundwater, ahead of other contaminants, and does not volatilize rapidly from surface water. It is relatively resistant to biodegradation in water and soil. Groundwater sampling for 1,4-dioxane is necessary to determine whether the remedy is protective. It is recommended that sampling for 1-4-dioxane at the Ralston site could initially be conducted in the wells that have had the highest concentrations of TCE. If it was not found to be present in these wells, it may not be necessary to sample throughout the groundwater plume. If it is found in these wells, more extensive groundwater sampling would be warranted to determine the extent of contamination and whether the remedy remains protective.

There are no unanticipated toxic by-products or daughter products of the remedy that were not previously addressed in the ROD.

Expected Progress Towards Meeting RAOs

The RAOs for soil are being met and the RAOs for groundwater are either being met or progressing as expected unless 1,4-dioxane is present and has moved beyond the extent of the contaminated groundwater plume that has been identified. Sampling groundwater for 1,4-dioxane will be necessary to determine whether it is present at this site.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?
No.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 00	**Issue Category:** Monitoring			
	Issue: Alluvial groundwater may discharge to Dry Run Creek			
	Recommendation: Develop plan for periodic sampling of Dry Run Creek to determine whether surface water and sediment have been impacted by contaminated groundwater.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	State	6/30/2018

OU(s): 00	**Issue Category:** Institutional Controls			
	Issue: Land use restrictions attached to the deed in the form of an environmental covenant have not been attached to the deed of the site property.			
	Recommendation: Implement an environmental covenant pursuant to the Uniform Environmental Covenants Act.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	State	6/30/2018

OU(s): 00	**Issue Category:** Institutional Controls			
	Issue: Use of well within protected water source area may have changed without evaluation of effect on contaminated plume.			
	Recommendation: Determine whether use of the well triggers the provisions of Chapter 53.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	State	6/30/2017

OU(s): 00	**Issue Category:** Monitoring			
	Issue: Unknown whether 1,4-dioxane is present in groundwater.			
	Recommendation: Sample monitoring wells for 1,4-dioxane.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	State	6/30/2018

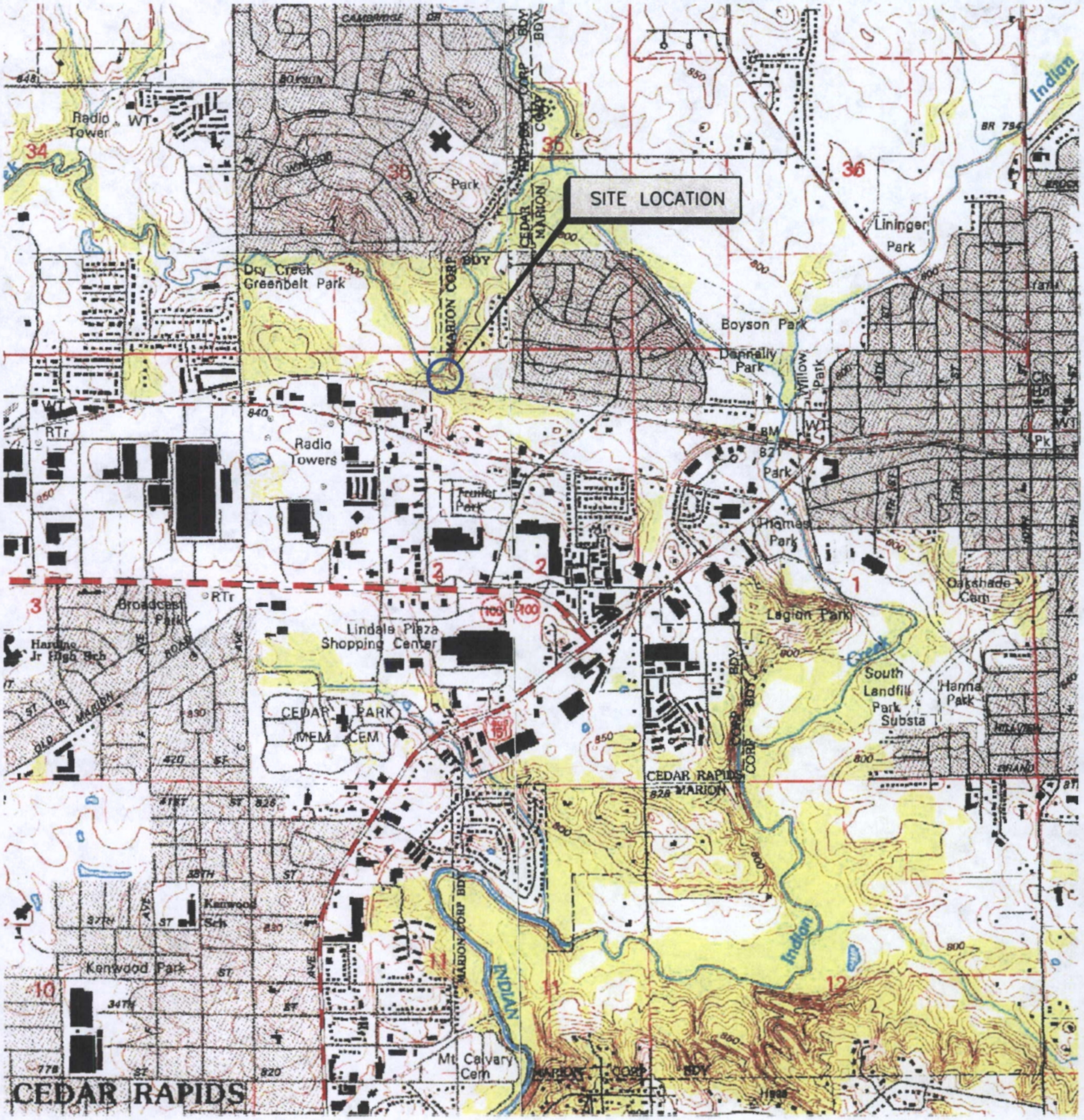
VII. PROTECTIVNESS STATEMENT

Sitewide Protectiveness Statement	
Protectiveness Determination: Protectiveness Deferred	*Planned Addendum Completion Date:* 11/30/2018
Protectiveness Statement: A protectiveness determination of the remedy at the Ralston site cannot be made until further information is obtained. Further information will be obtained by sampling to determine whether 1,4-dioxane is present in groundwater. Additionally, the change in groundwater use at the site will be evaluated to determine if use will affect the contaminated plume stability. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.	

VIII. NEXT REVIEW

The next five-year review report for the Ralston Superfund Site is required five years from the completion date of this review.

Figures



MAP SOURCE:

U.S.G.S. TOPOGRAPHIC QUADRANGEs
CEDAR RAPIDS NORTH, IOWA (1967, REVISED 1982)
MARION, IOWA (1968, REVISED 1982)

DESIGNED BY		MANAGING OFFICE	DES MOINES, IOWA
DRAWN BY	NORA DAY	PROJECT	ROCKWELL COLLINS, INC. CEDAR RAPIDS, IOWA
CHECKED BY			
APPROVED BY			
PROJECT MANAGER	STEVE VARSA	TITLE	SITE LOCATION MAP
CLIENT APPROVAL		FIGURE	1
CLIENT REFERENCE NO.		FILE NAME	

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MWH

REVISION

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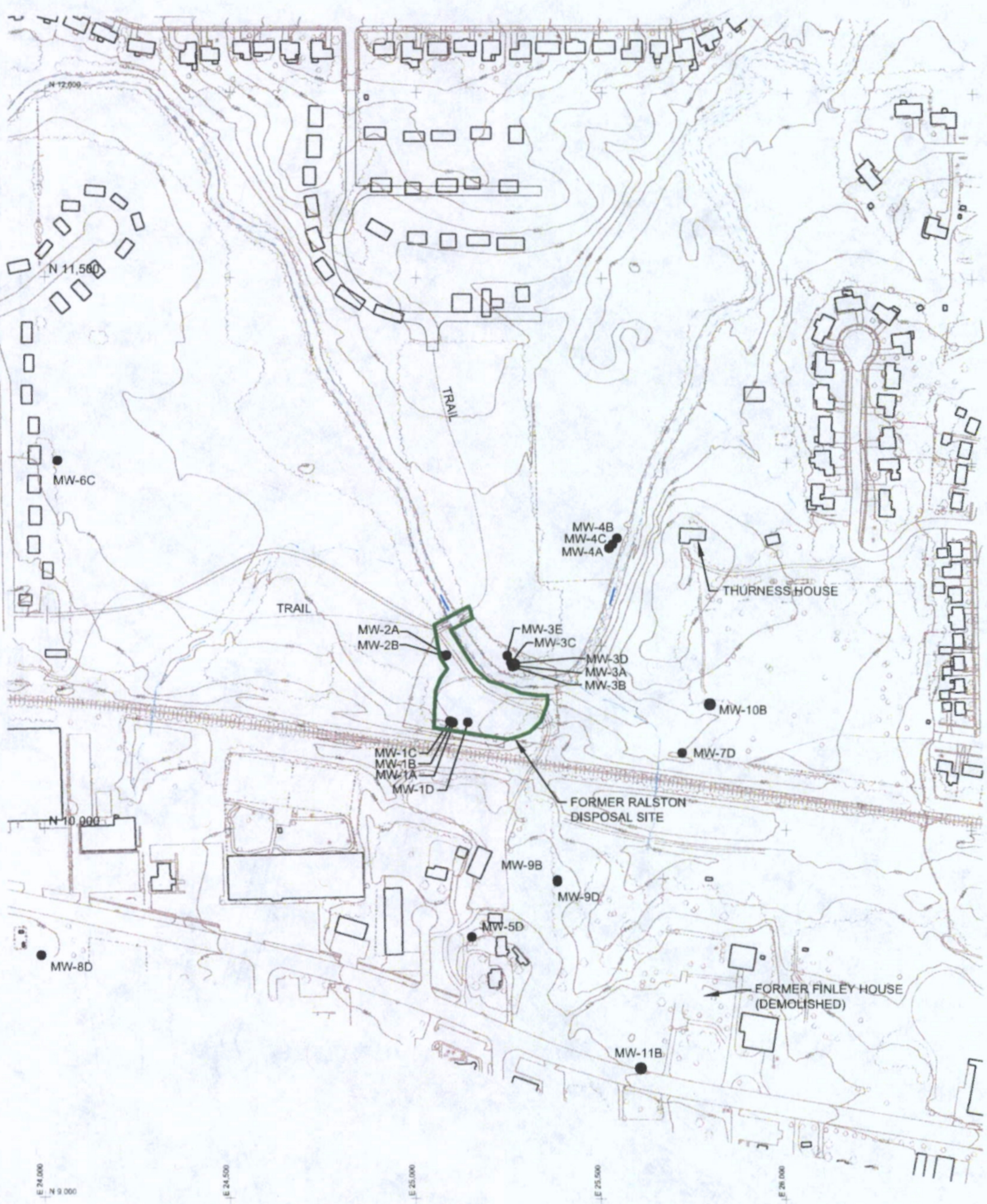


LEGEND:

- MONITORING WELL
- EXTENT OF DISPOSAL CAP
- FENCE

DESIGNED BY		
DRAWN BY	MATT WARNER	
CHECKED BY	ROB MALCOMSON	
APPROVED BY		
PROJECT MANAGER	STEVE VARSA	
CLIENT APPROVAL		
CLIENT REFERENCE NO.		

0 150 300
SCALE IN FEET

PROJECT LOCATION	DES MOINES, IOWA
PROJECT	ROCKWELL COLLINS, INC CEDAR RAPIDS, IOWA
TITLE	SITE MAP

MWH

FIGURE	2	REVISION	
FILE NAME			

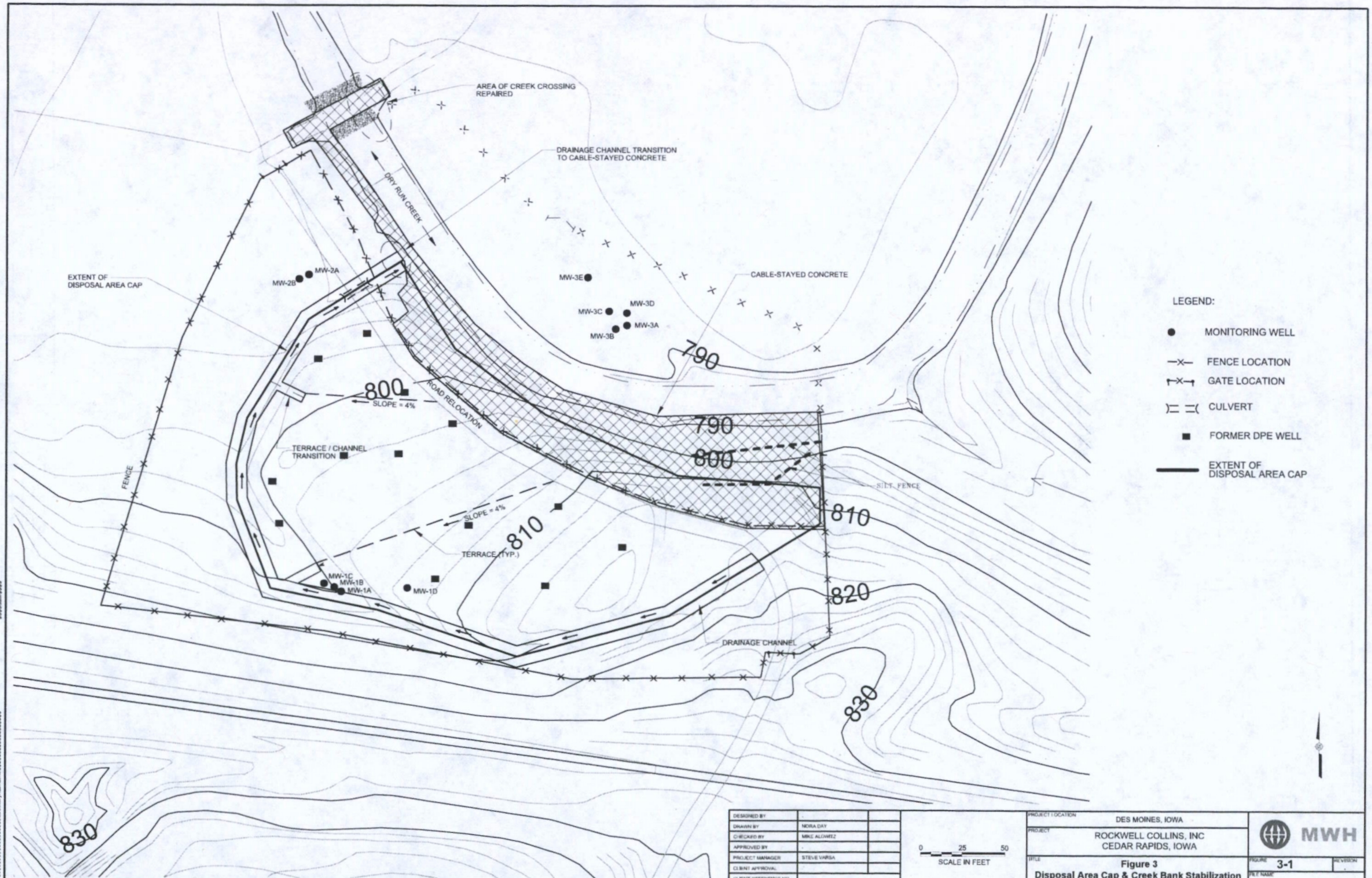
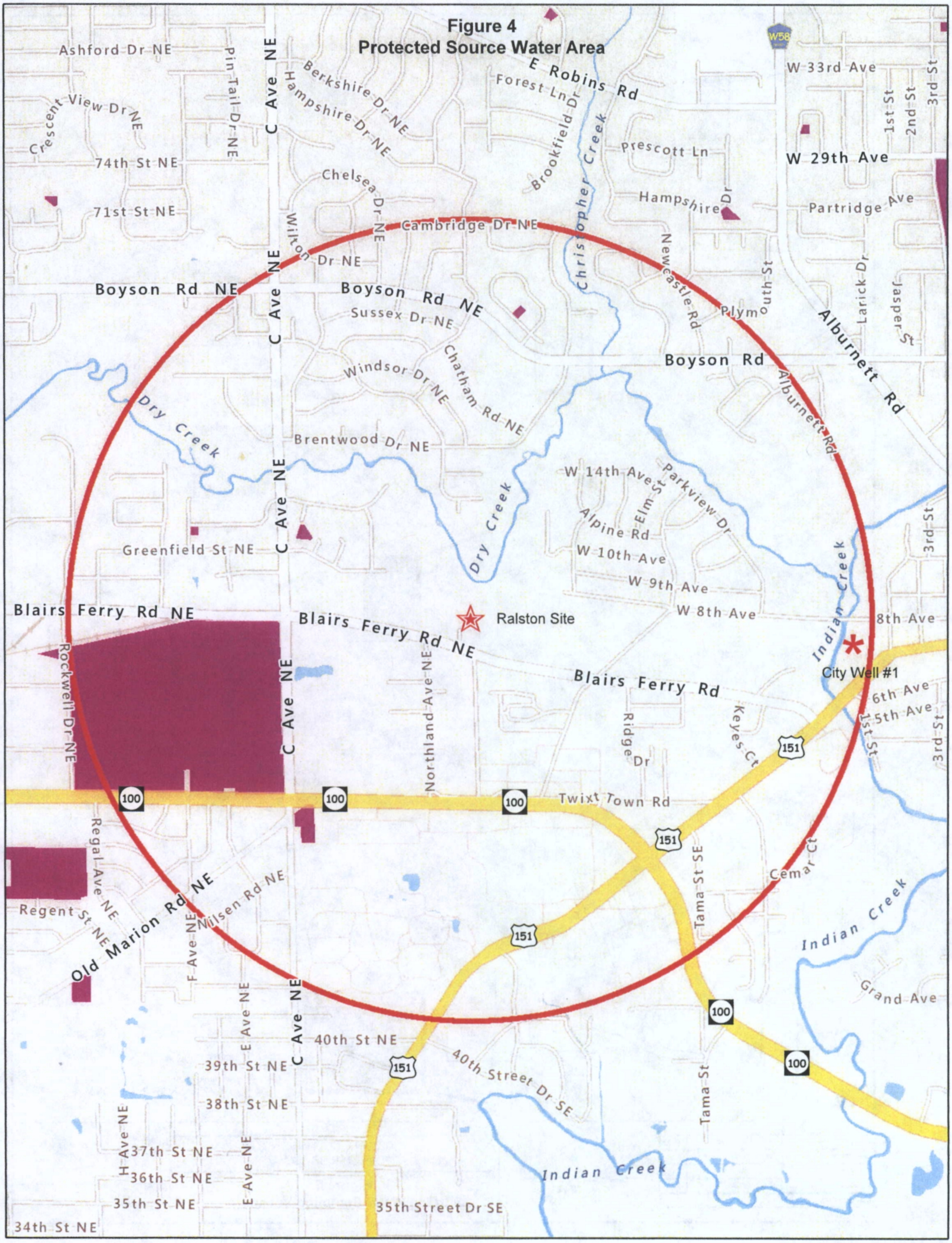
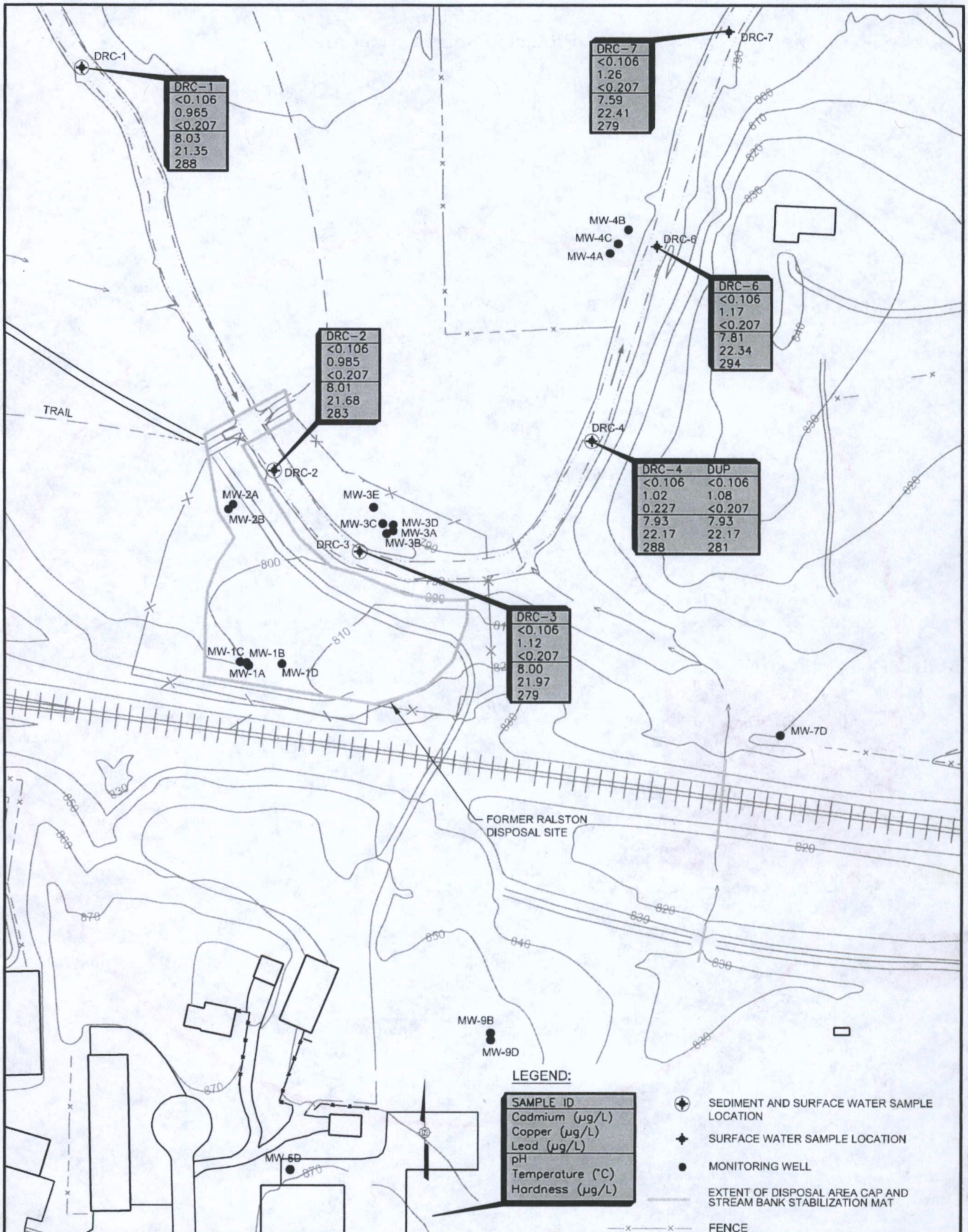


Figure 3
Disposal Area Cap & Creek Bank Stabilization

Figure 4
Protected Source Water Area





DESIGNED BY	.	
	NORA DAY	
CHECKED BY	MIKE ALOWITZ	
APPROVED BY		
PROJECT MANAGER	STEVE VARSA	
CLIENT APPROVAL		
CLIENT REFERENCE NO.	.	

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SCALE IN FEET

MANAGING OFFICE: DES MOINES, IOWA

PROJECT: ROCKWELL COLLINS, INC
CEDAR RAPIDS, IOWA

TITLE:
Figure 5
Surface Water Sampling Locations

MWH

FIGURE: 3-1
REVISION: .
FILE NAME: .

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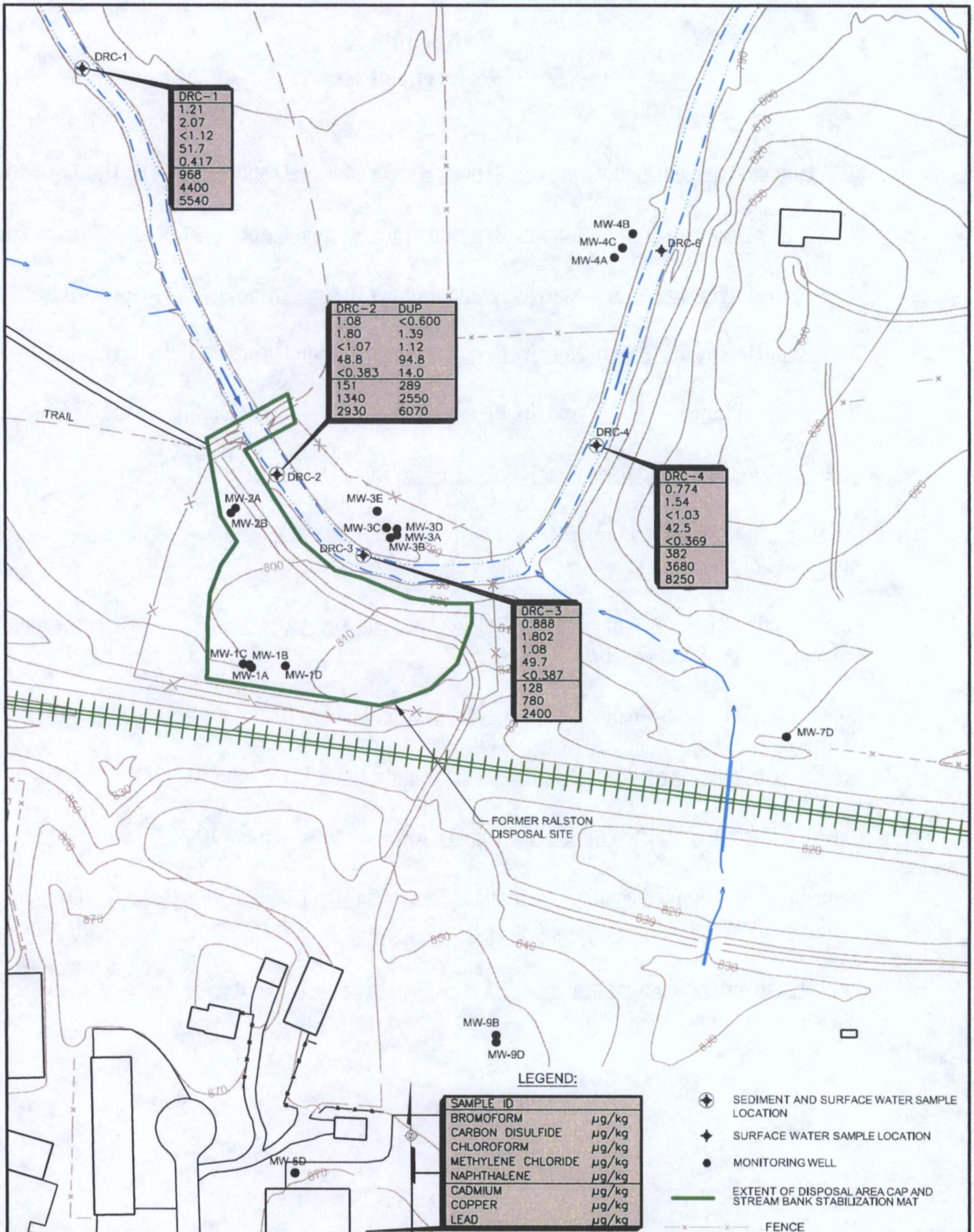

DESIGNED BY		MANAGING OFFICE	DES MOINES, IOWA
	NORA DAY	PROJECT	ROCKWELL COLLINS, INC CEDAR RAPIDS, IOWA
CHECKED BY	MIKE ALOWITZ		
APPROVED BY		TITLE	**Figure 6 Sediment Sampling Locations**
PROJECT MANAGER	STEVE VARSA	FIGURE	3-2
CLIENT APPROVAL		REVISION	
CLIENT REFERENCE NO.		FILE NAME	

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SCALE IN FEET

MWH

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Appendix A
Reference List

2011 Annual Remedial Action Activity Report, Former Ralston Disposal Site, MWH, March 2012.

2012 Annual Remedial Action Activity Report, Former Ralston Disposal Site, MWH, March 2013.

2013 Annual Remedial Action Activity Report, Former Ralston Disposal Site, MWH, April 2014.

2014 Annual Remedial Action Activity Report, Former Ralston Disposal Site, MWH, April 2015.

2015 Annual Remedial Action Activity Report, Former Ralston Disposal Site, MWH, March 2016.

Addendum to the Second Five-Year Review Report, EPA, December 2013.

Feasibility Study Report, Former Ralston Disposal Site, Cedar Rapids, Iowa, Montgomery Watson, August 1998.

Final Baseline Risk Assessment for the Ralston Disposal Site, Cedar Rapids, Iowa, CDM Federal Programs Corporation, October 21, 1994.

Love, Orlon, Marion Searches for Water, The Gazette, January 10, 2016.

Second Five-Year Review, Ralston Site, Cedar Rapids, Iowa, EPA, June 30, 2011.

Record of Decision, Ralston Site, Cedar Rapids, Iowa, EPA, September 1999.

Remedial Action Implementation Work Plan, Former Ralston Disposal Site, Cedar Rapids, Iowa, Montgomery Watson, September 2000.

Remedial Investigation Report, Former Ralston Disposal Site, Cedar Rapids, Iowa, Montgomery Watson, September 1997.

Appendix B
Chronology of Site Events

EVENT	DATE
103(c) Notification	6/1/1981
Preliminary Assessment	10/2/1985
Preliminary Assessment 2	11/8/1988
Site Inspection	12/15/1989
Site listing on the Registry of Hazardous Substance or Hazardous Waste Disposal Sites filed with the Linn County Recorder	6/14/1990
EPA Administrative Order on Consent for RI/FS	11/27/1991
EPA Administrative Order on Consent for Removal	2/16/1993
Removal Assessment completed	8/12/1993
Engineering Evaluation/Cost Analysis completed	12/2/1993
Protective water source area designation effective	11/13/1996
Removal actions completed	6/1997
RI/FS Reports completed	8/1998
Record of Decision signed	9/30/1999
EPA/IDNR Response Action Oversight and NPL Deferral Agreement	7/20/2000
IDNR Consent Order with Rockwell Collins	7/24/2000
Remedial Action Implementation Work Plan approved	10/10/2000
Remedial actions initiated with first semi-annual monitoring event	4/26/2001
Five-Year Review completed	5/18/2006
Second Five-Year Review completed	6/30/2011
Second Five-Year Review Addendum completed	12/13/2013

Appendix C

Groundwater Analytical Results

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-1A	07-92	5	180	170	2	1 J	<2.0	<2.0	
	02-93	2 J	120	190	2 J	<10	<10	<10	
	12-93	-	-	-	-	-	-	-	
	08-94	-	-	-	-	-	-	-	
	12-94	1.9	87.5	144	1.8	<1.0	<2.0	<1.0	
	06-95	1.3	16.8	11	<1.0	<1.0	<2.0	<1.0	
	09-95	2.0	34.7	42.6	<1.0	<1.0	<2.0	<1.0	
	12-95	2.3	56.7	84.4	1.7	<1.0	<2.0	<1.0	
	03-96	1.8	70.8	128	2.7	<1.0	<2.0	<1.0	
	06-96	2.3	28.4	15.1	<1.0	<1.0	<2.0	<1.0	
	09-96	2.6	33.9	20.4	<1.0	<1.0	<2.0	<1.0	
	04-01	1.0	7.4	2.1	<1.0	<2.0	<1.0	<0.5	
	10-01	1.3	12.1	4.3	<1.0	<2.0	<1.0	<0.5	
	05-02	1.1	10.1	5.1	<1.0	<2.0	<1.0	<0.5	
	10-02	1.2	9.3	5.4	<1.0	<2.0	<1.0	<0.5	
	04-03	2.3	29.3	10.3	<1.0	<2.0	<1.0	<0.5	
	10-03	2.13	20.3	7.13	<1.0	<2.0	<1.0	<0.5	
	04-04	1.06	9.11	3.13	<1.0	<2.0	<1.0	<0.5	
	10-04	1.07	11.2	3.87	<1.0	<2.0	<1.0	<0.5	
	04-05	1.10	10.0	2.80	<1.0	<2.0	<1.0	<0.5	
	10-05	2.13	19.6	6.06	<1.0	<2.0	<1.0	<0.5	
	04-06	1.20	11.0	4.71	<1.0	<2.0	<1.0	<0.5	
	04-07	1.59	17.2	20.5	<1.0	<2.0	1.75	<0.5	
	04-08	1.33	8.20	3.71	<1.0	<2.0	<1.0	<0.5	
	04-09	1.17	4.54	1.08	<1.0	<2.0	<1.0	<0.5	
	05-10*	<1.0/<1.0	2.34/2.15	<1.0/<1.0	<1.0 C/<1.0	<2.0/<10	<1.0<1.0	<0.5/<0.5	
	04-11	<1.0	1.36	1.04	<1.0	<2.0	<1.0	<0.5	
	04-12*	<1.0/<1.0	<4.0/<4.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<2.0/<2.0	<0.5/<0.5	
	06-13	<1.0	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	3.12	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	1.15	6.71	1.31	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-1B	07-92	7	250	860	9	2	7	1	
	02-93	<100	230	1,400	12 J	<100	<100	<100	
	12-93	-	-	-	-	-	-	-	
	08-94	2	60	380	3	3	<20	<2.0	
	12-94	5.5	115	703	5.2	1.4	<2.0	<1.0	
	06-95	3.0	27.7	35.1	<1.0	<1.0	<2.0	<1.0	
	09-95	5.1	55.4	110	1.0	<1.0	<2.0	<1.0	
	12-95	6.5	81.4	175	2.4	<1.0	<2.0	<1.0	
	03-96	4.0	47.4	46.5	<2.0	<2.0	<2.0	<2.0	
	03-96	4.0	47.4	46.5	<2.0	<2.0	<2.0	<2.0	
	06-96	4.3	41.1	23.4	<1.0	<1.0	<2.0	<1.0	
	09-96	5.8	56.8	40.9	<1.0	<1.0	<2.0	<1.0	
	04-01	1.7	11.9	6.2	<1.0	<2.0	<1.0	<0.5	
	10-01	2.0	20.3	25.7	<1.0	<2.0	<1.0	<0.5	
	05-02	3.7	35.4	53.9	<1.0	<2.0	<1.0	<0.5	
	10-02	2.6	21.6	21.4	<1.0	<2.0	<1.0	<0.5	
	04-03	5.2	67.2	56.7	<1.0	<2.0	<1.0	<0.5	
	10-03	4.98	49.0	46.7	<1.0	<2.0	<1.0	<0.5	
	04-04	1.93	15.8	12.0	<1.0	<2.0	<1.0	<0.5	
	10-04	3.71	34.7	34.2	<1.0	<2.0	<1.0	<0.5	
	04-05	3.45	34.1	47.9	<1.0	<2.0	<1.0	<0.5	
	10-05	5.25	48.4	56.9	<1.0	<2.0	<1.0	<0.5	
	04-06*	5.22/5.46	47.8/51.5	74.4/78.8	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-07	3.30	26.2	72.0 M1	<1.0	<2.0	<1.0	<0.5	
	04-08*	2.10/2.27	12.4/12.1	32.1/32.2	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-09	3.08	15.2	18.3	<1.0	<2.0	<1.0	<0.5	
	05-10	1.10	5.92	1.70	<1.0 C	<2.0	<1.0	<0.5	
	04-11	1.89	12.7	8.44	<1.0	<2.0	<1.0	<0.5	
	04-12	2.60	15.8	6.21	<1.0	<2.0	<2.0	<0.5	
	06-13	2.84	17.8	3.68	<1.00	<2.00	<1.00	<3.00	
	05-14	2.58	26.8	36.9	<1.00	<2.00	<1.00	<0.500	
	05-15	3.18	21.2	25	<1.00	<1.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-1C	07-92	0.6 J	65	43	0.5	2	<4.0	<4.0	
	02-93	<10	45	120	1	2	4 J	140	
	12-93	-	-	-	-	-	-	-	
	08-94	0.4 J	74	160	1	2	<10	16	
	12-94	-	66.9	181	1.2	2.3	<2.0	10.7	
	06-95	<1.0	58.1	157	<1.0	2.5	<2.0	47.1	
	09-95	≤1.0	85.4	229	<1.0	4.0	<2.0	1	
	12-95	<1.0	85.4	223	2.4	4.6	<2.0	1.1	
	03-96	<2.0	63.9	174	<2.0	2.6	<2.0	<2.0	
	06-96	<1.0	55.5	150	1.3	2.5	<2.0	<1.0	
	09-96	<1.0	59	160	1.6	2.7	<2.0	1.8	
	04-01	<1.0	67.5	248	9.4	3.5	<1.0	1.4	
	10-01	<1.0	62.7	261	1.7	3.2	<1.0	0.7	
	05-02	<1.0	65.6	249	1.9	3.7	<1.0	<0.5	
	10-02	<1.0	62.7	230	1.7	3.2	<1.0	0.7	
	04-03*	<1.0/<1.0	74.7/74.1	320/327	2.8/2.7	4.1/4.1	<1.0/<1.0	<0.5/<0.5	
	10-03	<1.0	66.0	267	2.19	4.05	<1.0	<0.5	
	04-04*	<1.0/<1.0	62.5/63.2	292/280	2.45/2.19	3.85/3.57	<1.0/<1.0	1.07/1.09	
	10-04	<1.0	65.2	307	2.33	4.30	<1.0	<0.5	
	04-05	<1.0	59.4	269	1.75	3.60	<1.0	<0.5	
	10-05*	<1.0/<2.0	62.2/63	332/290**	3.03/290**	4.38/5	1.24/<2.0	<0.5/<2.0	
	04-06	<1.0	59.4	271	2.18	3.62	<1.0	<0.5	
	04-07	<1.0	53.2	299	3.32	3.48	<1.0	<0.5	
	04-08	<1.0	50.5	299	2.35	3.84	<1.0	<0.5	
	04-09	<1.0	49.4	232	1.54	3.19	<1.0	<0.5	
	05-10	<1.0	52.4	295	3.04	3.19	<1.0	<0.5	
	04-11	<1.0	47.0	286	1.77	3.51	<1.0	<0.5	
	04-12	<1.0	40.8	251	2.96	2.93	<2.0	<0.5	
	06-13	<1.00	41.4	250	1.77	3.22	<1.00	<3.00	
	05-14	<1.00	40.0	293	1.73	3.48	<1.00	<0.500	
	05-15	<1.00	36.9	303	2.30	3.64	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-1D	07-92	-	-	-	-	-	-	-	
	02-93	<4.0	29	61	0.7 J	0.9 J	2 J	<4.0	
	12-93	0.5 J	35	130	2	1 J	<2	0.3 J	
	08-94	0.2 J	31	90	1	0.8 J	0.4	<2.0	
	12-94	<1.0	13.2	28.1	<1.0	<1.0	<1.0	<1.0	
	06-95	<1.0	21.9	47.9	<1.0	<1.0	<2.0	<1.0	
	09-95	<1.0	14.8	36.9	<1.0	<1.0	<2.0	<1.0	
	12-95	<1.0	8.3	18.4	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	5.7	8.3	<1.0	<1.0	<2.0	<1.0	
	06-96	<1.0	3.6	7.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	7.2	14.5	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	9.4	30.6	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	10.0	42.5	<1.0	<2.0	<1.0	<0.5	
	05-02	<1.0	3.6	9.2	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	10.9	41.32	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	2.6	7.2	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	3.60	11.7	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	11.1	63.4	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	11.7	52.3	<1.0	<2.0	<1.0	<0.5	
	04-05*	<1.0/<1.0	3.83/3.72	13.0/13.2	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	10-05*	<1.0/<2.0	1.78/<2.0	4.94/6**	<1.0/6**	<2.0/<2.0	<1.0/<2.0	<0.5/<2.0	
	04-06	<1.0	<1.0	1.80	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	3.76	21.2	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	17.3	108 M1	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	17.4	64.9	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	15.3	55.4	<1.0 C	<2.0	<2.0	<0.5	
	04-11	<1.0	14.3	49.6	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	7.01	28.8	<1.0	<2.0	<2.0	<0.5	
	06-13	<10.0	3.26	19.7	<1.00	<2.0	<1.0	<0.500	
	05-14	<1.00	<1.00	2.47	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	3.58	26.7	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-2A	07-92	<10	37	110	2 J	1 J	7 J	<10	
	02-93	2 J	36	88	1 J	<10	5 J	<10	
	12-93	-	-	-	-	-	-	-	
	08-94	-	-	-	-	-	-	-	
	12-94	<1.0	15.2	41.1	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	14.8	52.7	<1.0	<1.0	3.0	<1.0	
	09-95	<1.0	29.8	132	<1.0	<1.0	4.9	<1.0	
	12-95	<1.0	24.2	65.5	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	19.6	40.8	<1.0	<1.0	<2.0	<1.0	
	06-96	<1.0	17.4	33.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	31.9	109	1.4	<1.0	2.9	<1.0	
	04-01	<1.0	1.5	1.8	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	6	18	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	5.8	3.7	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	2.52	7.25	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	1.26	2.88	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	3.41	12.4	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	1.29	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	5.35	28.6	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-07*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0 C/<1.0 C	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-11	<1.0	<1.0	1.35	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<4.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<2.00	<1.00/<1.00	<0.500/<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-2B	07-92	<1.0	<1.0	<1.0	<1.0	<1.0	420	<1.0	
	02-93	<1.0	<1.0	<1.0	<1.0	<1.0	620	<1.0	
	12-93	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	
	08-94	<1.0	<1.0	<1.0	<1.0	<1.0	200	<1.0	
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	362	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	179	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	290	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	769	<1.0	
	03-96	<1.0	<1.0	1.2	<1.0	<1.0	939	<1.0	
	06-96	<1.0	<1.0	1.1	<1.0	<1.0	786	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	572	<1.0	
	04-01	<1.0	<1.0	2.0	<1.0	<2.0	625	<0.5	
	10-01	<1.0	12.1	3.0	<1.0	<2.0	559	<0.5	1.2[a]
	05-02	<1.0	<1.0	5.0	<1.0	<2.0	1,480	<0.5	
	10-02	<1.0	<1.0	2	<1.0	<2.0	461	<0.5	
	04-03*	<1.0/<1.0	<1.0/<1.0	7.7/7.8	<1.0/<1.0	<2.0/<2.0	1,000/991	<0.5/<0.5	6.3[b]
	10-03	<1.0	<1.0	6.46	<1.0	<2.0	886	<0.5	4.87[b]
	04-04	<1.0	<1.0	5.00	<1.0	<2.0	601	<0.5	0.31[c]
	10-04*	<1.0/<1.0	<1.0/<1.0	5.53/5.32	<1.0/<1.0	<2.0/<2.0	633/523	<0.5/<0.5	
	04-05	<1.0	<1.0	5.24	<1.0	<2.0	971	<0.5	
	10-05*	<1.0/<1.0	<1.0/<1.0	8.58/1.05	<1.0/<1.0	<2.0/<2.0	1,010/1,030	<0.5/<0.5	
	04-06	<1.0	<1.0	9.36	<1.0	<2.0	906	<0.5	
	04-08	<1.0	<1.0	3.49	<1.0	<2.0	474	<0.5	
	04-09	<10	<10	<10	<10	<20	298	<5.0	
	05-10	<5.0	<5.0	<5.0	<5.0	<50	413	<2.5	
	04-11*	<5.0/<10.0	<5.0/<10	<5.0/<10	<5.0/<10	<10/<20	375/446	<2.5/<5.0	
	04-12	<1.0	<4.0	2.81	<1.0	<2.0	448	<0.5	
	06-13	<1.00	<10.0	<10.0	<1.00	<2.00	797	<0.500	
	05-14*	<1.00/<1.00	<1.00/<1.00	20.7/18.8	<1.00/<1.00	<2.00/<2.00	1590/1300	<0.500/<0.500	
	05-15	<1.0	<1.0	11.7	<1.0	<2.0	956	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-3A	07-92	6 J	3,900	11,000	32 J	260	1,500	7 J	
	02-93	<2,500	4,300	33,000	<2,500	440 J	8,900	<2,500	
	12-93	-	-	-	-	-	-	-	
	08-94	-	-	-	-	-	-	-	
	12-94	1.2	1,670	15,000	69.2	22.5	2,420	5.8	
	06-95	-	-	-	-	-	-	-	
	09-95	-	-	-	-	-	-	-	
	12-95	<5	883	7,760	41.2	95.2	1,330	<5.0	
	03-96	<50	1,180	6,190	<50	87.0	872	<50	
	07-96	<10	5,000	32,300	60.3	400.0	2,320	<10	
	09-96	<10	302	7,100	42.7	83.6	814	2	
	04-01	2.0	4,460	28,300	1,780	390	1,160	4.5	3.3[d]
	10-01	<1.0	561	15,100	<1.0	<2.0	<1.0	3.0	
	05-02*	<1.0/<500	1,690/2,200	23,500/21,000	75.0	167/<500	969/1,400	3.2/<500	7.4[d], 2.6[e]
	10-02	<1.0	475	18,500	88.3	211	1,230	3.6	3.9[d], 8.8[e]
	04-03	<1.0	70.6	14,600	168	<100	927	<0.5	5.3[d], 1.8[e], 1.1[f]
	10-03	<1.0	173	7,080	64.7	52.2	472	1.79	3.96[d]
	04-04	1.30	3,580	22,800	246	298	966	4.42	3.62[d], 8.33[e]
	10-04	<1.0	198	8,120	58.6	78.5	640	1.78	1.08[e]
	04-05	<1.0	125	6,720	44.0	44.2	518	0.96	2.81[d]
	10-05*	<1.0/<100	264/220	5,910/6,700**	65.3/6,700**	42.9/<100	472/420	1.21/<100	3.20[d]
	04-06	<1.0	19.2	3,860	15.1	26.0	296	<0.5	2.44[d]
	04-07	<1.0	1,520	20,400	261	164	898	2.48	4.04[d]
	04-08	<1.0	2,390	23,200	59.1	222	739	3.01	4.19[d]
	04-09*	<5.0/<1.0	3,090/2,990	22,600/20,400	28.7/111	118/228	856/807	14.9/3.23	
	05-10	<100	6,140	30,800	<100	321	1,100	<50	
	04-11	<10	714	11,000	27.3	66.6	530	<5.0	
	04-12	<1.00	1,900	14,600	201	126	658	2.9	3.29[d]
	06-13	<1.00	2,140	12,600	110	164	555	2.04	2.44[d], 2.71[e]
	05-14	<1.00	854	8,970	238	74.1	710	1.31	2.00[d]
	05-15	<1.00	873	8,530	93.9	63.7	629	0.915	1.36[d]

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-3B	07-92	0.8 J	2,200	4,600	14	240	2,100	25	
	02-93	<500	1,200	4,800	<500	200 J	1,600	62 J	
	12-93	-	-	-	-	-	-	-	
	08-94	<2.0	580	2,400	12	140	1,800	13	
	12-94	<1.0	493	3,200	17.3	134	1,480	12.1	
	06-95	<1.0	410	2,630	21.9	117	1,560	9.6	
	09-95	<1.0	331	3,040	28.2	121	1,850	9.1	
	12-95	<1.0	337	3,100	26.9	141	1,890	10.6	
	03-96	<20	422	2,930	<20	102	1,480	<20	
	07-96	<1.0	562	3,340	9.0	117	1,300	9.8	
	04-01	<1.0	442	4,320	45.0	143	1,450	9.9	
	10-01	1.3	269	3,900	<1.0	<2.0	<1.0	10.2	
	05-02*	<1.0/<100	257/350	3,060/3,900	24.8	110/150	1,270/1,900	9.9/<100	
	10-02	<1.0	375	4,910	17.6	158	1,700	16.8	
	04-03	<1.0	348	5,880	75.1	157	2,490	16.8	
	10-03	<1.0	247	5,790	91.4	153	2,180	16.9	
	04-04	<1.0	332	5,050	46.1	142	1,830	14.1	
	04-04	<1.0	332	5,050	46.1	142	1,830	14.1	
	10-04	<1.0	224	4,760	22.8	124	1,990	15.8	0.41[e]
	04-05	<1.0	223	4,700	18.7	109	2,070	12.3	
	10-05	<1.0	145	6,100	103	133	2,820	14.9	
	04-06	<1.0	344	6,100	26.0	193	1,980	19.0	
	04-07	<1.0	324	6,410	142	132	1,810	14.7	
	04-08	<1.0	320	5,490	14.7	142	1,770	15.0	
	04-09	<10	256	5,380	28.7	118	1,850	14.9	
	05-10	<20	275	6,640	<20	<200	2,510	17.2	
	04-11	<10	714	5,830	16.3	103	1,850	12.0	
	04-12	<1.0	140	5,300	21.7	111	1,580	14.2	
	06-13	<1.00	315	6,220	46.3	159	2,100	17.1	
	05-14*	<1.00/<1.00	260/257	6120/6660	87.4/57.9	149/147	2590/2930	17.9/18.3	
	05-15	<1.0	155	6,080	32.2	132	2,250	14.6	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-3C	07-92	-	-	-	-	-	-	-	
	02-93	<2.0	0.7 J	8	<2.0	6 J	3	<2.0	
	12-93	-	-	-	-	-	-	-	
	08-94	<2.0	0.2 J	38,000	5	200 J	9,000	<2.0	
	12-94	<1.0	1.0	73,200	76.5	328	8,290	246	
	06-95	-	-	-	-	-	-	-	
	09-95	<1.0	1.2	204	2.1	2.6	202	<1.0	
	12-95	-	-	-	-	-	-	-	
	03-96	-	-	-	-	-	-	-	
	07-96	-	-	-	-	-	-	-	
	09-96	-	-	-	-	-	-	-	
	05-01	<1.0	<1.0	15,000	286	108	9,730	54.4	22.6[f], 3.4[e], 23.0[a], 3.4[g]
	10-01	<1.0	<1.0	37,200	119	242	6,950	79	
	05-02	<1.0	1.1	38,300	303	314	7,620	100	3.4[e], 66.4[f]
	10-02	<1.0	2.4	36,000	164	366	6,200	103	3[a], 3[g], 55.3[f]
	04-03	<1.0	1.0	40,100	429	430	7,360	113	1.5[a], 2.9[e], 54.4[f]
	04-04	<1.0	2.40	45,100	427	407	8,160	117	2.83[e], 1.92[g], 55.7[f]
	04-05	<1.0	1.00	46,700	201	352	9,430	119	2.52[e]
	10-05	<1.0	1.35	40,500	<100	347	7,100	120	2.89[e], 2.64[g]
	04-06	<1.0	1.12	41,800	396	451	7,610	137	1.63[a], 5.17[e], 73.8[f], ,3.34[g]
	04-07	<1.0	1.26	49,300	878	346	8,000	121	75.0[f], 1.94[g]
	04-08	<1.0	<20	40,200	111	381	8,050	121	1.07[h], 76.7[f]
	04-09	<100	<100	28,400	<100	236	6,520	91.0	
	05-10	<200	<200	35,600	<200	<2,000	9,640	<100	
	04-11	<10	<10	27,100	109	216	7,520	73.4	
	04-12	<20	<20	26,300	54.4	220	5,200	62.8	
	06-13	<1.00	<1.00	16,100	219	194	4,700	55.4	1.45[e], 3.17[f]
	05-14	<1.00	<1.00	16,600	197	146	5,830	50.7	2.83a,1.04e, 2.46[f], 4.16[g]
	05-15	<1.00	<1.00	27,900	180	303	6,050	78.3	1.88[e], 12.5[f]

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-3D	07-92	-	-	-	-	-	-	-	
	02-93	<50	58	500	<50	6 J	110	5 J	
	12-93	<2.0	7	33	0.4 J	0.4 J	2	<2.0	
	08-94	<2.0	3	15	0.4 J	0.4 J	7	<2.0	
	12-94	<1.0	2.2	11	<1.0	<1.0	2.6	<1.0	
	06-95	<1.0	2.1	6.4	<1.0	<1.0	<2.0	<1.0	
	09-95	<1.0	1.2	8.1	<1.0	<1.0	3.2	<1.0	
	12-95	<1.0	1.2	4.9	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	1.1	3.2	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	2.3	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	2.0	<1.0	<2.0	1.2	<0.5	
	05-02	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	<1.0	1.13	<1.0	<2.0	<1.00	<0.5	
	10-03*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-04*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	10-04	<1.0	<1.0	1.20	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	1.20	<1.0	<2.0	<1.0	<0.5	
	04-05*	<1.0/<1.0	<1.0/<1.0	1.31/1.59	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	10-05*	<1.0/<1.0	<1.0/<1.0	<1.0/1.05	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-06*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	1.64	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	1.02	5.05	<1.0	<10 M1a	1.95	<0.5	
	04-11	<1.0	<1.0	2.39	<1.0	<2.0	1.31	<0.5	
	04-12	<1.0	<2.0	1.56	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<2.00/<2.00	<1.00/<1.00	<0.500/<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-3E	12-93	<2.0	0.2 J	1 J	<2.0	<2.0	<2.0	<2.0	
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	1.9	<1.0	<2.0	<1.0	<0.5	
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-04*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<5.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<2.00/	<1.00/<1.00	<0.500/<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-4A	07-92	-	-	-	-	-	-	-	
	07-92	-	-	-	-	-	-	-	
	02-93	<2.0	<2.0	2	<2.0	<2.0	1 J	<2.0	
	12-93	-	-	-	-	-	-	-	
	08-94	-	-	-	-	-	-	-	
	12-94	<1.0	<1.0	1.4	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-95	<1.0	<1.0	3.2	<1.0	<1.0	<2.0	<1.0	
	12-95	<1.0	<1.0	3.7	<1.0	<1.0	2.2	<1.0	
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	1.2	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	2.4	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	3.0	<1.0	<2.0	2.4	<0.5	
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	2.8	<1.0	<2.0	2.2	<0.5	
	04-03	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	<1.0	3.27	<1.0	<2.0	1.93	<0.5	
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	3.43	<1.0	<2.0	1.64	<0.5	
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	2.35	<1.0	<2.0	1.63	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<0.5	
		<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-4B	07-92	-	-	-	-	-	-	-	
	02-93	<2.0	<2.0	0.3 J	<2.0	<2.0	0.7 J	<2.0	
	12-93	-	-	-	-	-	-	-	
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	2.5	<0.5	
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	1.21	<0.5	
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	1.50	<0.5	
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	1.46	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-4C	07-92	-	-	-	-	-	-	-	
	02-93	<2.0	0.6 J	1 J	<2.0	<2.0	<2.0	<2.0	
	12-93	<2.0	0.4 J	1 J	<2.0	<2.0	<2.0	<2.0	
	08-94	<2.0	0.4 J	1 J	<2.0	<2.0	<2.0	<2.0	
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	2[a]
	04-03	<1.0	<1.0	1.1	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	<1.0	1.02	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	<1.0	1.48	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	1.85	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	<1.0	1.36	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	1.28	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	1.70	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.0	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-5D	12-93	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	06-12	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	5.69[b]
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-7D	12-93	<2.0	1 J	1 J	<2.0	<2.0	<2.0	<2.0	
	08-94	<2.0	4	5	<2.0	0.2 J	<2.0	<2.0	
	12-94	<1.0	3.2	5.3	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	3.5	6.3	<1.0	<1.0	<1.0	<1.0	
	09-95	<1.0	3.0	6.6	<1.0	<1.0	<1.0	<1.0	
	12-95	<1.0	2.6	5.4	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	2.4	3.6	<1.0	<1.0	<2.0	<1.0	
	06-96	<1.0	1.6	3.2	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	1.9	3.4	<1.0	<1.0	<2.0	<1.0	
	04-01	<1.0	2.4	6.7	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	1.8	5.4	<1.0	<2.0	<1.0	<0.5	
	04-02	<1.0	1.3	3.8	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	1.8	3.9	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	1.2	3.1	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	<1.0	2.35	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	1.22	3.44	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	1.04	3.13	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	<1.0	1.34	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	1.40	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	1.76	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	1.51	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
MW-8D	12-93	0.4 J	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
	08-94	0.6 J	<2.0	0.6 J	<2.0	<2.0	<2.0	<2.0	
	12-94	<1.0	<1.0	1.0	<1.0	<1.0	<2.0	<1.0	
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-8D (continued)	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	
	06-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-03*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
MW-9B	08-94	<20	110	330	3 J	95	4, J	110	
	12-94	<1.0	3.6	153	<1.0	1.3	<2.0	<1.0	
	06-95	<1.0	5.5	371	2.7	4.8	3.2	<1.0	
	09-95	<1.0	1.6	52.6	<1.0	<1.0	<2.0	<1.0	
	12-95	<1.0	<1.0	31.9	<1.0	<1.0	<2.0	<1.0	
	03-96	<1.0	1.3	22.1	<1.0	<1.0	<2.0	<1.0	
	06-96	<1.0	4.2	39.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	6.5	99.3	<1.0	1.1	<2.0	<1.0	
	06-96	<1.0	4.2	39.0	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	6.5	99.3	<1.0	1.1	<2.0	<1.0	
	04-01	<1.0	5.6	500	5.8	4.8	4.6	<0.5	
	10-01	<1.0	3.4	381	1.3	2.8	<1.0	<0.5	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-9B	04-02	<1.0	1.6	73.0	<1.0	<2.0	2.5	<0.5	
(continued)	10-02	<1.0	4.3	366	3.3	<2.0	2.4	<0.5	
	04-03	<1.0	<1.0	13.5	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	3.17	229	2.00	3.21	17.0	<0.5	
	04-04	<1.0	4.90	646	4.08	6.23	8.26	<0.5	
	10-04	<1.0	1.89	225	1.69	2.35	<1.0	<0.5	
	04-05	<1.0	2.09	82.7	<1.0	<2.0	5.43	<0.5	
	10-05	<1.0	2.09	36.6	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	1.21	19.1	<1.00	<2.0	3.88	<0.5	
	04-07*	<1.0/<1.0	4.84/4.83	981/874	7.97/9.96	9.14/8.29	10.4/10.0	<0.5/<0.5	
	04-08*	<1.0/<1.0	2.44/2.48	498/499	2.83/23.46	5.12/5.41	19.5/19.2	<0.5/<0.5	
	04-09*	<1.0/<1.0	1.59/1.58	233/241	1.02/<1.0	2.36/2.30	13.5/15.0	<0.5/<0.5	
	05-10	<5.0	<5.0	205	<5.0	<50	17.8	<2.5	
	04-11*	<1.0/<1.0	1.58/1.45	193 /211	<1.0/<1.0	2.25/2.45	24.2/23.5	<0.5/<0.5	
	04-12*	<1.0/<1.0	<2.0/2.0	258 B B1/230	1.72/1.47	2.32/2.1	17.7/15.4	<0.5/<0.5	
	06-13	<1.00	2.26	91.5 B	2.40	<2.00	1.99	<0.500	
	05-14	<1.00	<1.00	37.4	<1.00	<2.00	3.48	<0.500	
	05-15*	<1.00/<1.00	2.01/1.55	161 B/141 B	10.7/12.8	<2.00/<2.00	3.58/2.45	<0.500/<0.500	
MW-9D	08-94	<2.0	5	12	<2.0	0.2 J	<2.0	<2.0	
	12-94	<1.0	4.2	11.1	<1.0	<1.0	<1.0	<1.0	
	06-95	<1.0	6.0	16.3	<1.0	<1.0	<1.0	<1.0	
	09-95	<1.0	5.2	17.8	<1.0	<1.0	<1.0	<1.0	
	12-95	<1.0	5.5	18.7	<1.0	<1.0	<1.0	<1.0	
	06-96	<1.0	5.9	14.8	<1.0	<1.0	<2.0	<1.0	
	09-96	<1.0	<1.0	13.2	<1.0	<1.0	<2.0	5.2	
	04-01	<1.0	4.3	14.2	<1.0	<2.0	<1.0	<0.5	
	10-01	<1.0	3.6	17.0	<1.0	<2.0	<1.0	<0.5	
	04-02	<1.0	5.3	19.5	<1.0	<2.0	<1.0	<0.5	
	10-02	<1.0	5.3	21	<1.0	<2.0	<1.0	<0.5	
	04-03	<1.0	5.0	20.3	<1.0	<2.0	<1.0	<0.5	
	10-03	<1.0	3.99	21.2	<1.0	<2.0	<1.0	<0.5	
	04-04	<1.0	5.09	32.3	<1.0	<2.0	<1.0	<0.5	
	10-04	<1.0	5.60	34.4	<1.0	<2.0	<1.0	<0.5	

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections
MW-9D	04-05	<1.0	4.50	23.2	<1.0	<2.0	<1.0	<0.5	
(continued)	10-05	<1.0	5.20	23.2	<1.0	<2.0	<1.0	<0.5	
	04-06	<1.0	3.04	11.4	<1.0	<2.0	<1.0	<0.5	
	04-07	<1.0	3.56	20.7	<1.0	<2.0	<1.0	<0.5	
	04-08	<1.0	4.17	29.1	<1.0	<2.0	<1.0	<0.5	
	04-09	<1.0	3.78	24.1	<1.0	<2.0	<1.0	<0.5	
	05-10	<1.0	4.40	33.1	<1.0	<10	<1.0	<0.5	
	04-11	<1.0	3.75	20.5	<1.0	<2.0	<1.0	<0.5	
	04-12	<1.0	3.28	18.8 B B1	<1.0	<2.0	<2.0	<0.5	
	06-13	<1.00	1.77	10.3	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	1.69	9.23	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	2.36	23.6 B	<1.00	<2.00	<1.00	<0.500	
MW-10B	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
MW-11B	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	
Groundwater Action Level		5	5	70	NE	7	2	5	

Notes:

Concentrations are presented in microgram(s) per liter (µg/L).
< = Less than.
B = Analyte was detected in the associated method blank.
B1 = Analyte was detected in the associated method blank. Analyte concentration in the sample is greater than 10x the concentration found in the method blank.
C = Calibration verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
J = Analyte reported below detection limit and is an estimated value.
M1 (2007, 2008 data) = The MS (matrix spike) and/or MSD (matrix spike duplicate) were outside control limits.
M1a (2010 data) = The MS and/or MSD were outside control limits.
- Indicates sample was not collected.
* Duplicate sample collection designations are as follows:
MW-1A; 05-10; blind duplicate sample collected from MW-1A; labeled as MW-1E (duplicate sample indicated second).
MW-1A; 04-12; blind duplicate sample collected from MW-1A; labeled as MW-1E (duplicate sample indicated second).
MW-2A; 06-13; blind duplicate sample collected from MW-2A labeled as MW-2C (duplicate sample indicated second).

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections

Notes (continued):

* Duplicate sample collection designations are as follows (continued):

MW-1B, 04-06; blind duplicate sample collected from MW-1B, labeled as MW-1E (duplicate sample indicated second).
MW-1B, 04-08, blind duplicate sample collected from MW-1B, labeled as MW-2C (duplicate sample indicated second).
MW-1C, 04-03; blind duplicate sample collected from MW-1C, labeled as MW-1E (duplicate sample indicated second).
MW-1C, 04-04; blind duplicate sample collected from MW-1C, labeled as MW-2C (duplicate sample indicated second).
MW-1C, 10-05; Iowa Department of Natural Resources (IDNR) split result.
MW-1D, 04-05; blind duplicate sample collected from MW-1D, labeled as MW-1E (duplicate sample indicated second).
MW-1D, 10-05; IDNR split sample result.
MW-2A, 04-07; blind duplicate sample collected from MW-2A, labeled as MW-2C (duplicate sample indicated second)
MW-2A; 05-10; blind duplicate sample collected from MW-2A; labeled as MW-2C (duplicate sample indicated second)
MW-2B, 04-03; blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).
MW-2B, 10-04; blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).
MW-2B, 10-05; blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).
MW-2B, 04-11; blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).
MW-2B, 05-14; blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).

MW-3A, 05-02; IDNR split sample result.
MW-3A, 10-05; IDNR split sample result.
MW-3A, 04-09, blind duplicate sample collected from MW-3A, labeled as MW-2C (duplicate sample indicated second).
MW-3B, 05-02; IDNR split sample result.
MW-3B, 05-14; blind duplicate sample collected from MW-3B, labeled as MW-1E (duplicate sample indicated second).

MW-3D, 10-03; blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).
MW-3D, 04-04; blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).
MW-3D, 04-05; blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).
MW-3D, 10-05; blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).
MW-3D, 04-06; blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).
MW-3D, 06-13; blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).
MW-3D, 05-15; blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second)

MW-3E, 10-04; blind duplicate sample collected from MW-3E, labeled as MW-1E (duplicate sample indicated second).

MW-8D, 10-03; blind duplicate sample collected from MW-8D, labeled as MW-1E (duplicate sample indicated second).

MW-9B, 04-07; blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).
MW-9B, 04-08, blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).
MW-9B, 04-09, blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).
MW-9B, 04-11; blind duplicate sample collected from MW-9B, labeled as MW-2C (duplicate sample indicated second).
MW-9B. 05-15; blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	Other VOC Detections

Notes (continued):

** Result is total 1,2-Dichloroethene (DCE).
[a] Carbon disulfide.
[b] Chloroethane.
[c] Carbon tetrachloride.
[d] 1,2-Dichlorobenzene.
[e] 1,1-Dichloroethane
[f] Toluene.
[g] 1,2-Dichloroethane.
[h] Ethylbenzene
[i] Bromomethane

NE = Groundwater Action Level not established (Record of Decision – September 1999).

Appendix D
Site Inspection Form

I. SITE INFORMATION	
Site name: Ralston	**Date of inspection: April 26, 2016**
Location: Cedar Rapids, IA	**EPA ID: IAD980632491**
Agency leading the five-year review: EPA Region 7	**Weather/temperature: Mid 50s, cloudy, light wind**

Remedy Includes: (Check all that apply)

☒ Landfill cover/containment
☒ Access controls
☒ Institutional controls
☐ Groundwater pump and treatment
☐ Surface water collection and treatment
☐ Other ______

☒ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Tom Gentner — Director, Environment, Safety & Health Operations — 4/26/16
   Name — Title — Date

   Interviewed ☒ at site ☒ at office ☐ by phone Phone no. ______

   Problems, suggestions; ☐ Report attached ______

2. **O&M staff** Steve Varsa — MWH, Project Mgr. — 4/26/16
   Name — Title — Date

   Interviewed ☒ at site ☒ at office ☐ by phone Phone no. ______

   Problems, suggestions; ☐ Report attached ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency IDNR
Contact Hylton Jackson | Project Manager | 4/26/16 | ____

Name	Title	Date	Phone no.
Hylton Jackson	Project Manager	4/26/16	

Problems; suggestions; ☐ Report attached

Agency Marion, IA Water Department

Name	Title	Date	Phone no.
Todd Steigerwaldt	General Manager	4/25/16	

Problems; suggestions; ☐ Report attached He is working with IDNR to resolve issues related to compliance with Protected Water Source Rule and city's need to meet increased demand for water. He was made aware that issue of use of City Well #1 would be discussed in the FYR report and that continued compliance with state rule was essential to protectiveness of the remedy at the Ralston site.

4. **Other interviews** (optional) ☐ Report attached.

We visited the downtown Cedar Rapids Public Library and the Ladd branch of the library checking on the availability of the Administrative Record. We spoke with several library staff members who were unable to locate the ARs or previous Five-Year Review Reports at either location.

III. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☒ Location shown on site map ☒ Gates secured ☐ N/A
Remarks

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs properly implemented ☒ Yes ☐ No ☐ N/A
Site conditions imply ICs being fully enforced ☒ Yes ☐ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting
Frequency annually
Responsible party/agency Rockwell Collins

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A
Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☒ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks Site of former Findley well is now a landscaping business.

IV. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☒ N/A
Remarks

B. Other Site Conditions

Remarks Creek crossing appears to be in good condition.

V. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent Depth
Remarks

2.	**Cracks** Lengths________ Widths________ Depths________ Remarks________	☐ Location shown on site map	☒ Cracking not evident
3.	**Erosion** Areal extent________ Depth________ Remarks________	☐ Location shown on site map	☒ Erosion not evident
4.	**Holes** Areal extent________ Depth________ Remarks________	☐ Location shown on site map	☒ Holes not evident
5.	**Vegetative Cover** ☒ Grass ☒ Cover properly established ☒ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram) Remarks________		
6.	**Alternative Cover (armored rock, concrete, etc.)** ☐ N/A Remarks <u>Creek bank is cable-matted and appears to be in excellent conditions. No trees growing through stabilized area.</u>		
7.	**Bulges** Areal extent________ Height________ Remarks________	☒ Location shown on site map	☒ Bulges not evident
8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks________	☒ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	 Areal extent________ Areal extent________ Areal extent________ Areal extent________
9.	**Slope Instability** ☐ Slides Areal extent________ Remarks________	☐ Location shown on site map	☒ No evidence of slope instability
B. Benches	☐ Applicable ☒ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
C. Letdown Channels	☐ Applicable ☒ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
D. Cover Penetrations	☒ Applicable ☐ N/A		

1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A Remarks
3.	**Monitoring Wells** (within surface area of landfill) ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A Remarks
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A Remarks

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

F. Cover Drainage Layer ☐ Applicable ☒ N/A

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

H. Retaining Walls ☐ Applicable ☒ N/A

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

VI. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

C. Treatment System ☐ Applicable ☒ N/A

D. Monitoring Data

1.	Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
2.	Monitoring data suggests: ☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1.	**Monitoring Wells** (natural attenuation remedy) ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks

VII. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). The inspection confirms that maintenance of the disposal area cap and creek bank stabilization are effective and functioning as intended. The engineering and institutional controls aimed at limiting access to the site and controlling the use of the property are effective.
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. O&M activities primarily relate to maintenance of the disposal area cap, creek bank stabilization and maintenance of monitoring wells. All of these areas appear to have been well maintained, supporting long-term protectiveness of these elements of the remedy.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. Nothing was observed.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The opportunities for optimization are limited to reductions in sampling frequency and analytes. The IDNR has responded to requests from Rockwell Collins regarding these issues.

Site Inspection Attendees

Name	Representing
Diana Engeman	EPA-Region 7
Pamela Houston	EPA-Region 7
Hylton Jackson	IDNR
Shelly Nellesen	IDNR
Tom Gentner	Rockwell Collins
Steve Varsa	MWH-consultant to Rockwell Collins