



# Annual Inspection Report Jeffrey Energy Center Fly Ash Landfill

Prepared for:

Westar Energy

Jeffrey Energy Center

St. Marys, Kansas

Prepared by:

APTIM Environmental & Infrastructure, Inc.

January 2018



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## CCR Regulatory Requirements

USEPA CCR Rule Criteria 40 CFR §257.84	Jeffrey Energy Center (JEC) Annual Inspection Report
<p>§257.84(b)(1)(i) stipulates:</p> <p><i>“(b) Annual inspections by a qualified professional engineer. (1) Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:</i></p> <p style="padding-left: 40px;"><i>(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections)”</i></p>	<p>Section 3.0</p>
<p>§257.84(b)(1)(ii) stipulates:</p> <p><i>“(b) Annual inspections by a qualified professional engineer. (1) Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:</i></p> <p style="padding-left: 40px;"><i>(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.”</i></p>	<p>Section 5.0</p>

USEPA CCR Rule Criteria 40 CFR §257.84	Jeffrey Energy Center (JEC) Annual Inspection Report
<p>§257.84(b)(2)(i) stipulates:</p> <p><i>“(2) Inspection report. The qualified professional engineer must prepare a report following each inspection that addresses the following:</i></p> <p style="padding-left: 40px;"><i>(i) Any changes in geometry of the structure since the previous annual inspection;”</i></p>	<p style="text-align: center;">Section 6.1</p>
<p>§257.84(b)(2)(ii) stipulates:</p> <p><i>“(ii) The approximate volume of CCR contained in the unit at the time of the inspection;”</i></p>	<p style="text-align: center;">Section 6.2</p>
<p>§257.84(b)(2)(iii) stipulates:</p> <p><i>“(iii) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit;”</i></p>	<p style="text-align: center;">Section 6.3</p>
<p>§257.84(b)(2)(iv) stipulates:</p> <p><i>“(iv) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.”</i></p>	<p style="text-align: center;">Section 6.4</p>

<p align="center"><b>USEPA CCR Rule Criteria 40 CFR §257.84</b></p>	<p align="center"><b>Jeffrey Energy Center (JEC) Annual Inspection Report</b></p>
<p>§257.84(b)(4) stipulates:</p> <p><i>(4) Frequency of inspections. The owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the initial inspection report is the basis for establishing the deadline to complete the first subsequent inspection. Any required inspection may be conducted prior to the required deadline provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. For purposes of this section, the owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record as required by §257.105(g)(9).</i></p>	<p align="center">Section 1.0</p>
<p>§257.84(b)(5) stipulates:</p> <p><i>"(5) If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken."</i></p>	<p align="center">Section 7.0</p>
<p>§257.84(c) stipulates:</p> <p><i>"(c) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g)."</i></p>	<p align="center">Sections 8.0</p>

## 1.0 INTRODUCTION

APTIM Environmental and Infrastructure, Inc. (Aptim, f/k/a CB&I Environmental & Infrastructure, Inc.) has prepared the following Annual Inspection Report (Report) at the request of Westar Energy (Westar) for the Fly Ash Landfill (Landfill) located at the Jeffrey Energy Center (JEC) in St. Marys, Kansas. JEC is a coal-fired power plant that has been in operation since 1980. The Landfill has been deemed to be a regulated coal combustion residual (CCR) unit by the United States Environmental Protection Agency (USEPA), through the Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (CCR Rule) Title 40 Code of Federal Regulations (CFR) Part §257 and §261.

In support of compliance to the CCR Rule, Mr. Richard Southorn (a qualified professional engineer with Aptim) conducted an on-site inspection of the Landfill on November 6<sup>th</sup> 2017. Prior to inspection, Aptim personnel reviewed the relevant portions of the facility's operating record and first annual inspection report in relation to this Report, under the direct supervision of Mr. Southorn. This Report meets the requirements set forth within 40 CFR §257.84(b)(1) and (b)(2) based the review of available information and visual observation, to evaluate if the design, construction, operation, and maintenance of the Landfill is consistent with good engineering standards. The annual landfill inspection has been conducted and completed in compliance with the frequency of inspection timeframe set forth in §257.84(b)(4).

## 2.0 JEC LANDFILL OVERVIEW

Westar owns and operates an industrial landfill at JEC near St Marys, Pottawatomie County, Kansas. JEC is located approximately 4.5 miles north of Belvue, Kansas and approximately 4.5 miles west of Highway 63 and resides in Sections 1, 2, 11, and 12, Township 9 South, Range 11 East and Sections 6 and 7, Township 9 South, Range 12 East. The location of the Landfill is depicted in **Figure 1**.

The Landfill is located within the JEC boundary in Fly Ash Area 1, which is approximately 98.8 acres. There is also proposed Fly Ash Area 2 which is approximately 59.5 acres and not yet constructed. This Report reflects the complete inspection of Fly Ash Area 1. Existing site topography is depicted in **Figure 2**.

Fly ash is transported to the active portion of the Landfill, where it is placed and graded by dozers and compacted. Periodic dozing of the fly ash material will occur as needed, within the active area to maintain a relatively uniform grade. The fly ash will be wetted prior to the final cover placement and will form a hardened surface as it dries.



### 3.0 REVIEW OF AVAILABLE INFORMATION

Prior to the on-site inspection, Mr. Southorn reviewed the available information for the Landfill as provided by Westar:

- ❑ Kansas Department of Health and Environment – Bureau of Waste Management (KDHE-BWM) Industrial Landfill Permit No. 0359, October 15, 2015.
- ❑ Jeffrey Energy Center Routine Inspection Reports, January through September 2017.
- ❑ Annual Inspection Report Jeffrey Energy Center Fly Ash Landfill, CB&I Environmental & Infrastructure, Inc., January 2017.

Mr. Southorn verified the available information during the on-site inspection on November 6<sup>th</sup> 2017.

### 3.1 Summary of Inspection Reports

All routine inspections at the Landfill were reviewed. The site inspection confirmed the active landfilling area has been maintained to prevent erosion and airborne dust. It was noted in the inspections that:

- ❑ Repairs and stabilization construction were performed on the berm. This included topsoil being stripped and rock being placed;
- ❑ Erosion channels were noted and addressed; and
- ❑ Numerous small trees were growing on the east side of the main berm above Tower Hill Lake. The berm was mowed to control the woody vegetation.

### 3.2 Summary of Previous Annual Inspection Report

Based on a review of the 2016 Annual Inspection Report, it noted that there were two areas of shallow sloughing on the south berm. The sloughing stabilization repairs were completed during the 2016/2017 construction seasons. Repairs included regrading as necessary and the placement of riprap in sloughing areas to prevent future erosion that may result from seepage. This approach is appropriate to address the area of sloughing on the southern berm.

Additionally it was determined that the environmental control systems at the Landfill were functioning as designed. It was noted that gaps in the perimeter berm surrounding the active landfill area have potential to allow stormwater to flow into the active area. Gaps in the perimeter berm were being filled during the 2016 annual inspection to provide adequate protection to ensure stormwater does not flow onto the active area. The contact water management system was believed to be in good operating condition and functioning as intended.

#### **4.0 2017 CONSTRUCTION SUMMARY**

In 2017, the run-on diversion berms were completed around the Landfill to ensure that all water that previously ran into the Landfill from upslope areas is directed around the Landfill to Tower Hill Lake.

## **5.0 INSPECTION SUMMARY**

During the on-site inspection, Mr. Southorn focused on standard geotechnical signs of distress or malfunction such as slumping at the toe of slopes, tensile cracking, abnormal or excessive erosion on the side slopes or stormwater management facilities slope bulging, and groundwater/surface water seepage or ponding. These visual signs are potential indicators of structural weakness of the Landfill.

### **5.1 Visual Signs of Distress or Malfunction**

During the on-site inspection, slope appearance, slope stability, and overall site conditions were assessed. No erosion or sloughing were observed along the perimeter. Closed portions of the Landfill exhibited well-established vegetative cover and do not present concern.

The areas that were repaired in 2016 to mitigate seepage/sloughing near the toe of slope appear to be functioning as intended. No slope movement was observed. The area appeared well maintained.

### **5.2 Review of Environmental Control Systems**

With no evidence to the contrary, the hydraulic structures at the Landfill are believed to be in good operating condition and functioning as intended. At the time of inspection, stormwater conveyance systems, such as the diversion channels, were operating as designed. The contact water management system is believed to be in good operating condition and functioning as intended.

## **6.0 CONCLUSIONS**

Based on a review of the available facility information and on-site inspection, the following conclusions were developed:

### **6.1 Changes in Geometry**

As of the date of this inspection, the Landfill is actively accepting CCR material. Changes in geometry were evaluated by comparing topographic information from the April 2016 survey and the latest survey conducted in March 2017. It was determined that no changes have occurred to the landfill with exception of minor grading to promote positive drainage of stormwater and ash placement within the active portion of the Landfill.

### **6.2 CCR Volume**

The total permitted disposal capacity for the Landfill is 3,746,000 cubic yards (cy). Based on the most recent survey, the remaining capacity was estimated at approximately 550,939 cy. The volume of CCR material contained within the Landfill is approximately 3,195,061 cy. The average fill rate for the Landfill is approximately 60,360 tons per year (tons/yr) of CCR material. Based on the fill rate, it is estimated that the Landfill has a remaining operational life of approximately 10 years.

### **6.3 Structural Weakness and Disrupting Conditions**

At the time of this inspection, there were no signs of distress or malfunction that would indicate actual or potential structural weakness at the Landfill.

### **6.4 Changes Affecting Stability and Operations**

There have been no changes to the Landfill that pose a threat or concern to the stability of the landform. The run-on divergence berms that have been installed minimize the potential for landfill stability issues. Previous repairs to the Landfill slope are functioning as intended and appear to have mitigated erosion and stability concerns. Landfill operations and maintenance have not deviated from the original designed plan.

## 7.0 RECOMMENDATIONS

Based on the on-site inspection performed on November 6<sup>th</sup> 2017, Aptim recommend the following actions:

- Continue to monitor erosion controls, animal burrows, and vegetative cover on a routine basis.
- Continue proper management of the active landfill areas.
- Continue to monitor all stormwater conveyance features for signs of erosion or malfunction on a routine basis.

## **8.0 RECORDS RETENTION AND MAINTENANCE**

### **8.1 Incorporation of Plan into Operating Record**

§257.105(g) of 40 CFR Part §257 provides record keeping requirements to ensure that this Plan will be placed in the JEC's operating record. Specifically, §257.105(g) stipulates:

*§257.105(g): "(g) Operating criteria. The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record: (9) The periodic inspection report as required by §257.84(b)(2)."*

This Report will be placed within the Facility Operating Record upon Westar's review and approval.

### **8.2 Notification Requirements**

§257.106(g) of 40 CFR Part §257 provides guidelines for the notification of the availability of the Report. Specifically, §257.106(g) stipulates:

*§257.106(g): (g) Operating criteria. The owner or operator of a CCR unit subject to this subpart must notify the State Director and/or appropriate Tribal authority when information has been placed in the operating record and on the owner or operator's publicly accessible internet site. The owner or operator must: (7) Provide notification of the availability of the periodic inspection reports specified under §257.105(g)(9)."*

The State Director and appropriate Tribal Authority will be notified upon placement of this Report in the Facility Operating Record.

§257.107(g) of 40 CFR Part §257 provides publicly accessible Internet site requirements to ensure that this Report is accessible through the Westar webpage. Specifically, §257.107(g) stipulates:

*§257.107(g): (g) Operating criteria. The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR Web site: (7) The periodic inspection reports specified under §257.105(g)(9)."*

This Report will be uploaded to Westar's CCR Compliance reporting Website upon Westar's review and approval.

## 9.0 PROFESSIONAL ENGINEER CERTIFICATION

The undersigned registered professional engineer is familiar with the requirements of the CCR Rule and has visited and examined JEC or has supervised examination of JEC by appropriately qualified personnel. I hereby certify based on a review of available information within the facility's operating records and observations from my personal on-site inspection (including the photographs contained in **Appendix A**), that the Landfill does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the Landfill. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices. This certification was prepared as required by 40 CFR Part §257.84(b).

Name of Professional Engineer: Richard Southorn

Company: Aptim

Signature: 

Date: JAN 5, 2018

PE Registration State: Kansas

PE Registration Number: PE25201

Professional Engineer Seal:



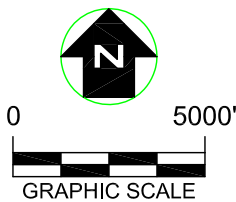
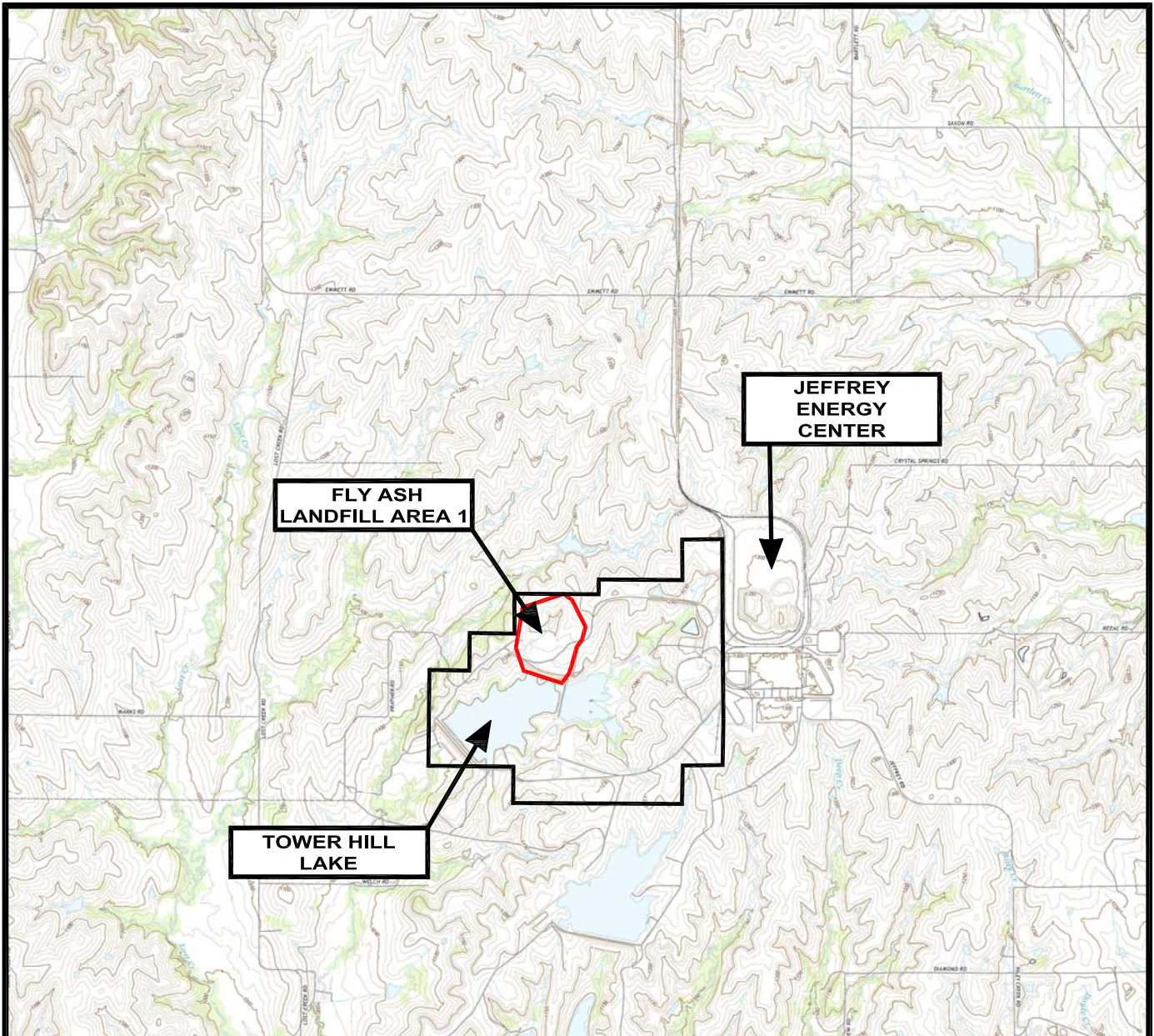
## FIGURES

Figure 1 – Fly Ash Area 1, Site Location Plan

Figure 2 – Fly Ash Area 1, Existing Site Topography

Figure 3 – Fly Ash Area 1, Photo Log Plan View





**LEGEND**

- CCR UNIT BOUNDARY
- KDHE-BWM INDUSTRIAL LANDFILL PERMIT NO. 0359 BOUNDARY

**NOTES**

1. AERIAL TOPO OBTAINED FROM USGS 7.5-MINUTE SERIES, EMMETT AND LACLEDE QUADRANGLE, KANSAS, 2014.
2. ALL BOUNDARIES ARE APPROXIMATE.



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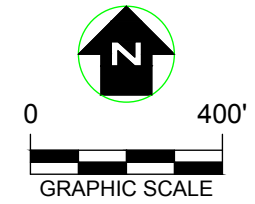
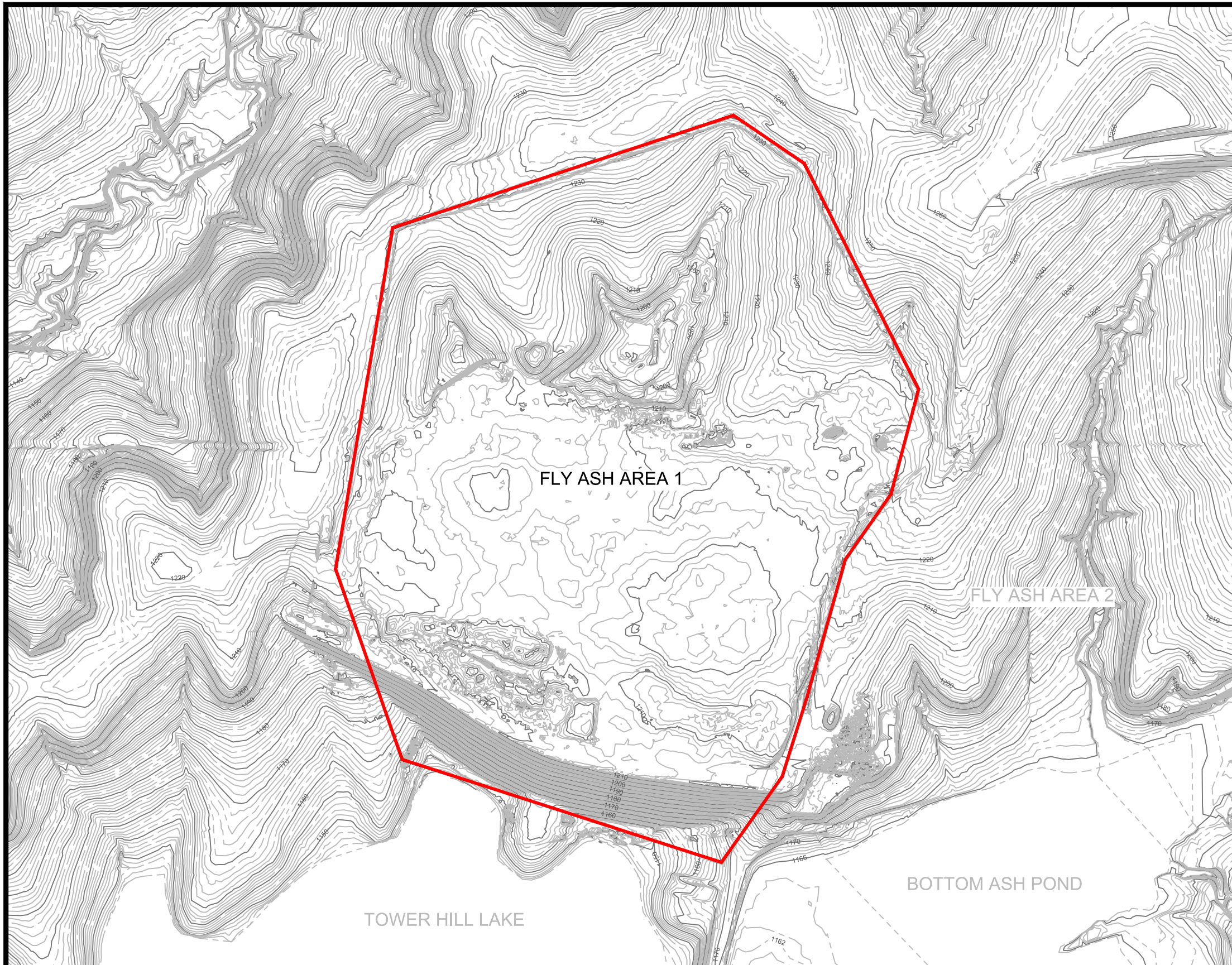
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25905 JEFFREY RD., ST. MARYS, KS**

**FIGURE 1  
FLY ASH AREA 1  
SITE LOCATION PLAN**

APPROVED BY: RDS | PROJ. NO.: - | DATE: JANUARY 2018

T:\AutoCAD\Projects\Westar Energy\CCR\Annual-Inspections\2017\Jeffrey\Annual-Inspection Photo Log Plan.dwg, 1/5/2018 11:10:12 AM, AutoCAD PDF (High Quality Print).pc3



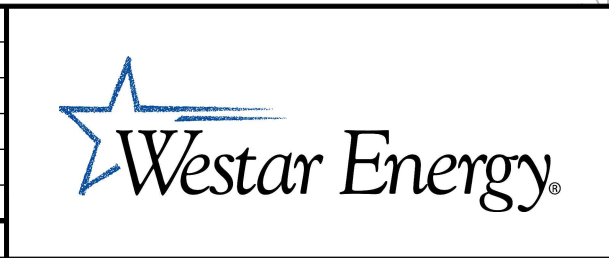

**LEGEND**

— CCR UNIT BOUNDARY

**NOTES**

1. EXISTING CONTOURS DEVELOPED BY PROFESSIONAL ENGINEERING CONSULTANTS IN MARCH 2017.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. FLY ASH AREA 1 BOUNDARY IS APPROX. 98.8 ACRES.
4. ALL BOUNDARIES ARE APPROXIMATE.
5. REFER TO APPENDIX A FOR PHOTOGRAPHIC DOCUMENTATION.

REV. NO.	DATE	DESCRIPTION

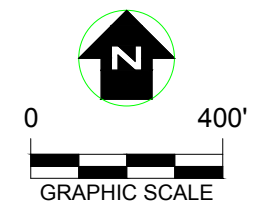
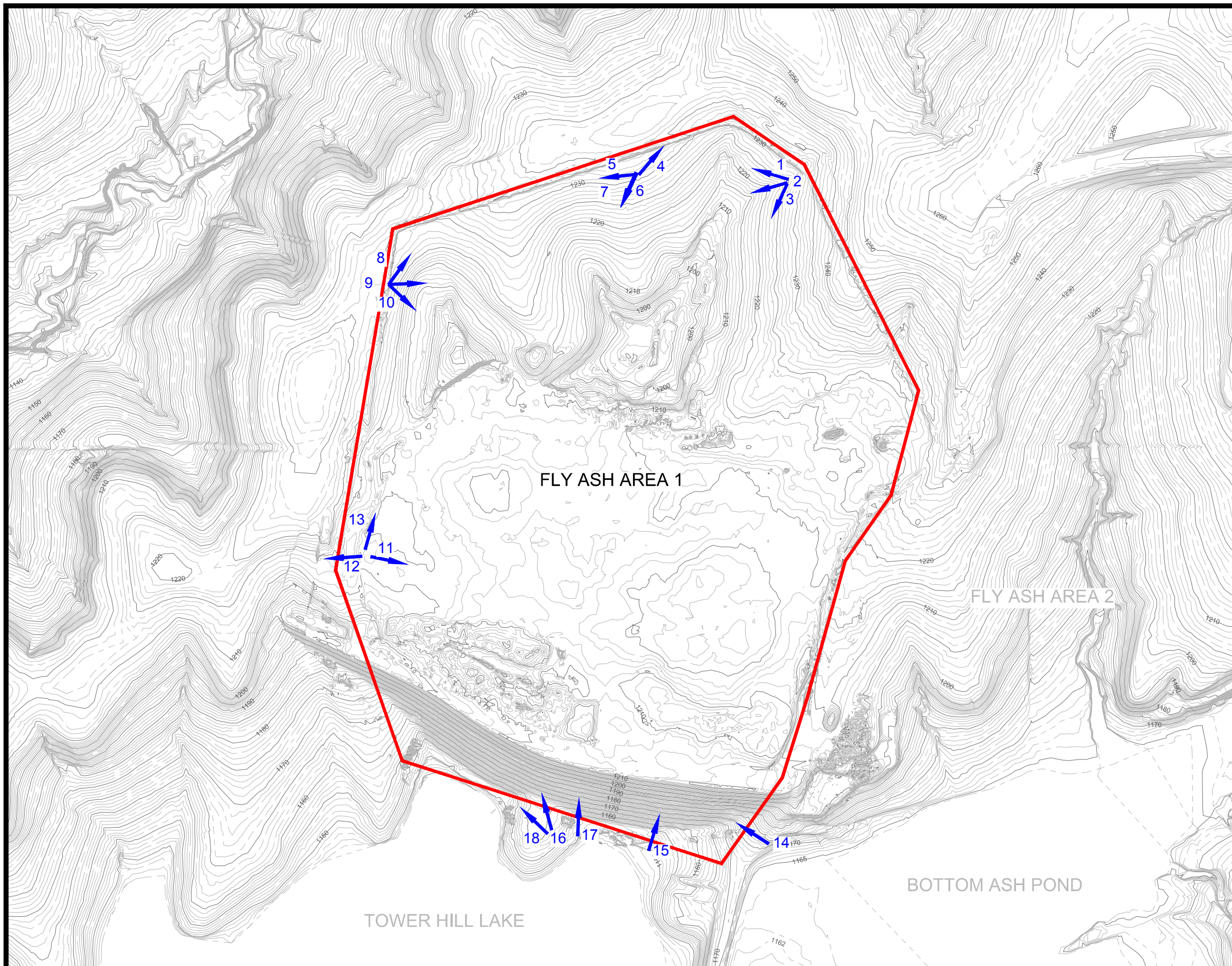
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**FIGURE 2**  
**FLY ASH AREA 1**  
**EXISTING SITE TOPOGRAPHY**

DRAWN BY:	ORC	APPROVED BY:	RDS	PROJ. NO.:	-	DATE:	JANUARY 2018
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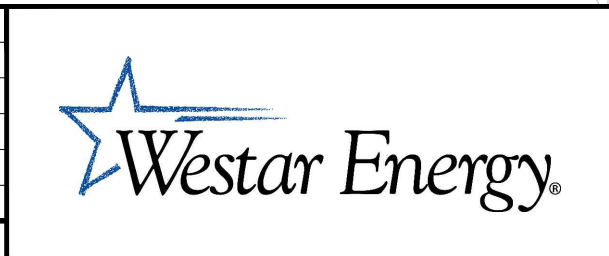
**LEGEND**

- CCR UNIT BOUNDARY
- ← 2017 ANNUAL INSPECTION PHOTOGRAPH (ARROW DENOTES DIRECTION OF VIEW)

**NOTES**

1. EXISTING CONTOURS DEVELOPED BY PROFESSIONAL ENGINEERING CONSULTANTS IN MARCH 2017.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. FLY ASH AREA 1 BOUNDARY IS APPROX. 98.8 ACRES.
4. ALL BOUNDARIES ARE APPROXIMATE.
5. REFER TO APPENDIX A FOR PHOTOGRAPHIC DOCUMENTATION.

REV. NO.	DATE	DESCRIPTION



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**FIGURE 3**  
**FLY ASH AREA 1**  
**PHOTO LOG PLAN VIEW**

DRAWN BY:	ORC	APPROVED BY:	RDS	PROJ. NO.:	631214397	DATE:	JANUARY 2018
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# APPENDIX A

## Annual Inspection Photo Log

**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 1**

**Date:**

November 6, 2017

**Direction:**

287° W

**Description:**

Fly ash berms have been completed from last year. Vegetation has been established.



**Photograph No. 2**

**Date:**

November 6, 2017

**Direction:**

254° W

**Description:**

Observing active fly ash area operations and maintenance. No evidence of ponding or airborne dust.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 3**

**Date:**

November 6, 2017

**Direction:**

205° SW

**Description:**

Observing active fly ash area operations and maintenance.  
No evidence of ponding or airborne dust.



**Photograph No. 4**

**Date:**

November 6, 2017

**Direction:**

41° NE

**Description:**

Observing the stormwater diversion berm section.  
Vegetation is well established and maintained.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 5**

**Date:**

November 6, 2017

**Direction:**

264° W

**Description:**

Observing the stormwater diversion berm section. Vegetation is well established and maintained.



**Photograph No. 6**

**Date:**

November 6, 2017

**Direction:**

205° SW

**Description:**

Observing active fly ash area operations and maintenance. No evidence of ponding or airborne dust.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 7**

**Date:**

November 6, 2017

**Direction:**

204° SW

**Description:**

Observing active fly ash area operations and maintenance. No evidence of ponding or airborne dust.



**Photograph No. 8**

**Date:**

November 6, 2017

**Direction:**

36° NE

**Description:**

Observing the stormwater diversion berm section. Vegetation is well established and maintained.





**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 9**

**Date:**

November 6, 2017

**Direction:**

88° E

**Description:**

Observing active fly ash area operations and maintenance. Slight evidence of airborne dust, however no dust appears to be leaving the Landfill area



**Photograph No. 10**

**Date:**

November 6, 2017

**Direction:**

134° SE

**Description:**

Observing the fly ash area vegetative pile.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 11**

**Date:**

November 6, 2017

**Direction:**

102° E

**Description:**

Observing active fly ash area operations and maintenance.  
No evidence of ponding or airborne dust.



**Photograph No. 12**

**Date:**

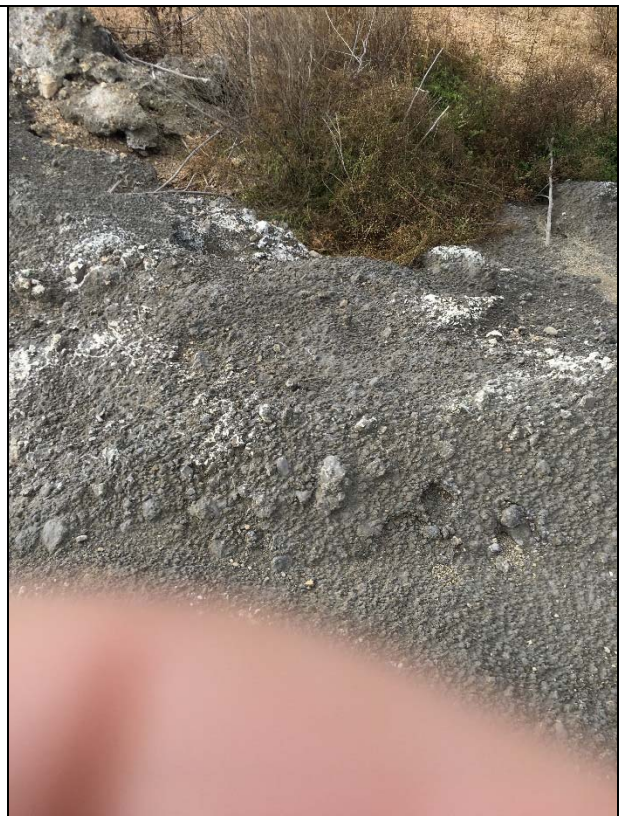
November 6, 2017

**Direction:**

266° W

**Description:**

Observing active fly ash area operations and maintenance.  
No evidence of ponding or airborne dust.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 13**

**Date:**

November 6, 2017

**Direction:**

16° N

**Description:**

Observing active fly ash area operations and maintenance. No evidence of ponding or airborne dust.



**Photograph No. 14**

**Date:**

November 6, 2017

**Direction:**

303° NW

**Description:**

Observing landfill sideslope. Vegetation is well established and maintained. No evidence of erosion or malfunction. Previous sloughing described in 2016 Annual Inspection Report was repaired.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 15**

**Date:**

November 6, 2017

**Direction:**

17° N

**Description:**

Observing landfill side slope. Vegetation is well established and maintained. No evidence of erosion or malfunction at this location.



**Photograph No. 16**

**Date:**

November 6, 2017

**Direction:**

345° N

**Description:**

Observing landfill side slope. It was noted to have area of sloughing erosion in 2016 Annual Inspection Report. Riprap was added where sloughing seep was fixed. No evidence of erosion or malfunction at this location currently.



**Project:** Fly Ash Area 1 Landfill Inspection

**Photographer:** Richard Southorn

**Photograph No. 17**

**Date:**

November 6, 2017

**Direction:**

2° N

**Description:**

Observing limits of slope repair. Riprap was added where sloughing seep was fixed, as noted in the 2016 Annual Inspection Report. No evidence of erosion or malfunction at this location currently.



**Photograph No. 18**

**Date:**

November 6, 2017

**Direction:**

314° NW

**Description:**

Observing limits of slope repair. Riprap was added where sloughing seep was fixed, as noted in the 2016 Annual Inspection Report. No evidence of erosion or malfunction at this location currently.

