Workplan

DUST SAMPLING AND ANALYSIS PLAN FOR THE FORMER SATRALLOY SITE JEFFERSON COUNTY, OHIO

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1.0 INTRODUCTION

This document is the sampling and analysis plan for dust placed in the Dust Staging Area as described in the Interim Action Workplan (Golder 2012) at the Former Satralloy Site located in Cross Creek Township, Jefferson County, Ohio (the Site).

1.1 Background

The south and north mill buildings and their respective baghouses are currently being cleaned to remove dust, and the resultant dust is being placed into one and ten cubic yard (CY) bags and stored. Once the dust bags are placed in storage, access for sampling will be difficult. It is therefore proposed that samples will be collected from representative bags as they accumulate, so that the dust bags may be stored in an efficient manner. Composite samples will then be collected from the dust samples to represent the areas to be characterized.

Table 1 gives the approximate areas for specified dust removal areas in the mill buildings and baghouse areas, and the estimated dust volumes for areas where dust has been removed (as of February 19). Dust removal is ongoing. The North Mill Building (NMB) has an estimated two to three times the volume of dust as the South Mill Building (SMB).

There are five flat roofs at the site where dust has accumulated. These are the flat portions of the roofs on the NMB and the SMB, the cooling water pumphouse (CWPH), the wastewater treatment plant (WWTP), and the electrical building (Figure 1). The dust on these flat roofs is saturated due to accumulation on the flat roofs and subsequent exposure to weather. The roofs have not been previously accessed due to safety issues.

Composite samples will be collected from the saturated dust on four roofs. The electrical building roof will not be sampled because it contains only a thin layer of dust, and there is no reason to believe that the dust on this roof differs from the other roof dust. Table 2 gives the approximate areas and dust volumes for the flat roofs to be sampled.

1.2 Scope and Objectives

The scope of this sampling and analysis plan covers the dust to be placed in the Dust Staging Area at the Site. The objective for dust sampling is to provide data to be used in the Remedial Investigation and Feasibility Study (RI/FS) to determine appropriate disposition of the dust as part of the Site remedy.

Table 1: Dust Removal Areas and Volumes

Dust Removal Area	Estimated Area (square feet)	Estimated Dust Volume (CY)
SOUTH MILL BUILDING		
Ground floor furnace foundation area	20,000	
Ground floor casting bay area	21,000	
Ground floor ramp and finishing bay area	19,000	
First floor A area (south third of floor)	6,500	31
First floor B area (center third of floor)	6,500	31
First floor C area (north third of floor)	6,500	18
Second floor A area (south third of floor)	6,500	24
Second floor B area (center third of floor)	6,500	48
Second floor C area (north third of floor)	6,500	27
Third floor A/mezzanine/rafters/crane	1,500	10
Third floor B/mezzanine/rafters/crane	2,500	7
Third floor A/mezzanine/rafters/crane	4,000	25
Outside silos ground area	4,800	
Baghouse #3 structure	2,800	80
Baghouse #3 (dust on ground underneath structure)	3,100	
SOUTH MILL BUILDING TOTALS	**117,700**	**301**
NORTH MILL BUILDING		
Ground floor furnace foundation area	30,000	
Ground floor casting bay area	40,000	
Ground floor ramp and finishing bay work area	40,000	
First floor A area (south half of floor)	15,000	
First Floor B area (north half of floor)	15,000	
Second floor A area (south half of floor)	15,000	
Second Floor B area (north half of floor)	15,000	
Third floor A area (south half of floor)	15,000	
Third Floor B area (north half of floor)	15,000	
Mezzanine area/ rafter	5,000	
Conveyor room	1,000	
Outside silos ground area	5,500	
Baghouse #2 structure	3,000	
Baghouse #2 (dust on ground underneath structure)	3,300	
Baghouse #1 Structure	2,800	
Baghouse #1 (Dust on ground underneath structure)	3,000	
NORTH MILL BUILDING TOTALS	**223,600**	

Note: Dust volumes incomplete because dust removal is ongoing. Volumes as of February 20, 2014.

Table 2: Flat Roof Areas

Flat Roof	Length (feet)	Width (feet)	Area (square feet)	Estimated Depth of Dust (inches)
South Mill Building	64	16	1024	1-4
North Mill Building	340	80	27200	2-6
Cooling water pump house	72	33	2376	1-4
Wastewater treatment plant	52	25	1300	1-4

2.0 DUST SAMPLING FROM BUILDING INTERIORS AND BAGHOUSES

A series of dust samples will be collected from building interiors and baghouse areas in a systematic manner from the dust bags as they accumulate during the dust removal. Composite samples will be prepared in a tiered manner by collecting grab samples from the dust bags, and then collecting increments from selected grab samples and combining them into composite samples that represent the specified areas to be sampled. The areas of each tier are shown in Table 3.

Environmental conditions could have affected the dust, possibly causing some variability in metals concentrations or leaching potential. These environmental conditions may include exposure to weather (i.e., dust in the baghouse areas), or exposure to surface soil (i.e., dust on the ground floors). Therefore, the Tier 1 dust samples have been placed into 3 categories: dust on the ground floor, dust on other floors, and baghouse dust.

In order to effectively characterize the dust removed and identify variabilities in the dust, it will be necessary to consider: a) the volume of dust removed per area, and b) relatively uniform coverage per area. Upon completion of the dust removal activities, the volumes of dust collected from each area will be known, and any other observations as to variability or uniformity of the materials removed can be evaluated.

2.1.1 Grab Samples

Grab samples will be collected in each Tier 2 area (see Table 3) at a rate of one sample per every 10 bags (each bag representing one CY) in the SMB and associated baghouse, and one sample per every 20 bags in the NMB and associated baghouses (the NMB has an estimated two to three times the volume of dust as the SMB). At least one sample will be collected from each Tier 2 area. A 10 CY bag will be treated as 5 one CY bags (they are not completely filled). Dust samples from each specified bag will be collected into a 16-ounce glass jar, labeled to identify the bag sampled, and stored at the Site under chain-of-custody. This approach will result in approximately the same number of samples per building and respective baghouses or approximately 30 samples per building.

A plastic trowel will be used to collect the dust material from the dust bags and place the material into a 16-ounce jar. The grab samples will be labelled to indicate the Tier 2 area that the sample represents. The dust bags may contain construction debris such as broken concrete or cobbles. In order to access the dust material in the dust bags, it may be necessary to move or remove the non-dust debris. A plastic drop cloth will be placed under the dust bags while accessing them for grab sampling to capture loose material that might escape during the sampling process. Loose material will be replaced back into the bags after sampling.

Table 3: Tier 1 and 2 Areas for Composite Samples

Tier 1 Areas	Tier 2 Areas
South Mill Building Ground Floor	
	Ground floor furnace foundation area
	Ground floor casting bay area
	Ground floor ramp and finishing bay area
South Mill Building Other Floors	
	First floor A area (south third of floor)
	First floor B area (center third of floor)
	First floor C area (north third of floor)
	Second floor A area (south third of floor)
	Second floor B area (center third of floor)
	Second floor C area (north third of floor)
	Third floor A/mezzanine/rafters/crane
	Third floor B/mezzanine/rafters/crane
	Third floor A/mezzanine/rafters/crane
South Mill Building Baghouse Area	
	Outside silos ground area
	Baghouse No.3 structure
	Baghouse No.3 (dust on ground underneath structure)
North Mill Building Ground Floor	
	Ground floor furnace foundation area
	Ground floor casting bay area
	Ground floor ramp and finishing bay work area
North Mill Building Other Floors	
	First floor A area (south half of floor)
	First Floor B area (north half of floor)
	Second floor A area (south half of floor)
	Second Floor B area (north half of floor)
	Third floor A area (south half of floor)
	Mezzanine area/ rafter
	Conveyor room
	Outside silos ground area
North Mill Building Baghouse Area	
	Baghouse No.2 structure
	Baghouse No.2 (dust on ground underneath structure)
	Baghouse No.1 Structure
	Baghouse No.1 (Dust on ground underneath structure)

2.2 Composite Samples

Composite samples will be collected from the dust samples at the completion of the dust removal activity in a tiered approach.

Tier 1 composite samples will be prepared by taking increments from the corresponding Tier 2 grab dust samples and combining them into composite samples to represent each Tier 1 area. Tier 1 composite samples will be assembled by taking one-half cup increment of material (using a gauged sampling trowel) from each corresponding Tier 2 grab sample within the Tier 1 area. The increment will be placed into a mixing bowl and thoroughly mixed. The mixed material will be placed into sample containers and labelled to indicate the Tier 1 area the sample represents. For example, the Tier 1 Ground Floor SMB sample will be a composite of the grab dust samples collected from the three associated Tier 2 regions (ground floor furnace foundation area, the ground floor casting bay area, and the ground floor ramp and finishing bay area).

The composite samples will be analyzed as specified in Section 3. After reviewing the results, additional composite samples representing Tier 2 areas may be prepared and analyzed, as needed.

3.0 DUST SAMPLING FROM FLAT ROOFS

A series of dust samples will be collected from four flat roofs in a systematic manner prior to dust removal. A manlift will be employed to gain access to the roofs, and samples will be collected with a long-handled sampling device. It is estimated that all selected roof areas can be reached except for the area extending approximately 15 feet from the western edge of the NMB flat roof.

A systematic grid (five-foot intervals) was established for each flat roof, and three randomly selected subsample locations were selected for each flat roof, with the exception of the NMB. For the NMB, a total of five grid nodes were selected from the flat roof area, omitting the 15-foot portion of the roof along the western edge that is inaccessible for sampling. The subsample locations are given in Table 4.

Dust grab samples will be collected from the flat roofs at each selected grid node using the long-handled sampling device. The samplers will endeavor to collect dust from the entire thickness of dust accumulated at the grid node. A cup of material will be pulled from the sampling device (using a gauged trowel or spoon) and placed into a mixing container. Upon completion of grab sample collection, the sampled material will be thoroughly mixed, and placed into sample containers. A duplicate sample will be collected from the NMB roof.

Table 4: Flat Roof Dimensions and Subsample Coordinates

	NMB		SMB		CWPH		WWTP	
Length	340		64		72		52	
Width	80		16		33		25	
POI	**SSW**		**SW**		**SW**		**SW**	
Increments	X	Y	X	Y	X	Y	X	Y
1	196.1	1.7	50.7	13.4	19.9	23.1	29.6	20.4
2	111.1	28.4	10.7	4.5	55.9	4.8	16.6	6.5
3	281.1	55.0	42.7	9.8	10.9	15.8	42.6	14.9
4	4.8	10.6	NA	NA	NA	NA	NA	NA
5	174.8	37.3	NA	NA	NA	NA	NA	NA

Notes:
All distances are in feet
NA = Not applicable
POI = Point of origin for grid (corner of roof)
X = distance from point of origin along length
Y = distance from point of origin along width

3.1 Quality Control Samples

For quality control purposes, duplicate composite samples will be prepared and analyzed for two of the Tier 1 areas and from the NMB flat roof. Duplicate samples will be collected by preparing two sets of composite samples from the grab samples for the selected duplicate samples. The duplicate samples will be from the SMB ground floor, the NMB baghouse area, and the NMB flat roof.

The relative percent difference (RPD) of the duplicate results will be calculated to evaluate the precision of the sample collection techniques. If the RPD exceeds 15% for Tier 1 areas, then Tier 2 samples for that Tier 1 area will be analyzed. If the RPD exceeds 15% for the roof sample, then the need for additional sampling will be discussed with Ohio Environmental Protection Agency (OEPA).

4.0 ANALYSIS

The samples will be shipped under chain-of-custody to a qualified laboratory for the analyses listed in Table 5. Dust analytical parameters are consistent with those for slag samples in the Remedial Investigation (RI) (see Table 6-1 in Golder 2013).

Laboratory preparation of the dust samples will include thorough mixing of the material from each composite sample in a bowl or laying the material out in a slab cake if the volume is too large for a bowl (i.e., the NMB flat roof sample is expected to be six cups in volume). Analytical aliquots will be pulled from the mixed sample.

Table 5: Analytical Methods and Requirements

Analysis	Extraction Method	Digestion Method	Hold Time	Sample Size for Analysis
TAL metals	EPA 3050B	EPA 6010C	180 days	10 gm
Hexavalent Cr [1]	EPA 3060A [2]	EPA 7196A/7199A	28 days	10 gm
SPLP Cr	EPA 1312	EPA 6020	180 days	100 gm
Paste pH	NA	EPA 9045D	NA	25 gm
Particle size distribution	NA	ASTM D6913	NA	100 gm
Mineralogy by XRD	NA	EPA 6300	NA	< 1 gm

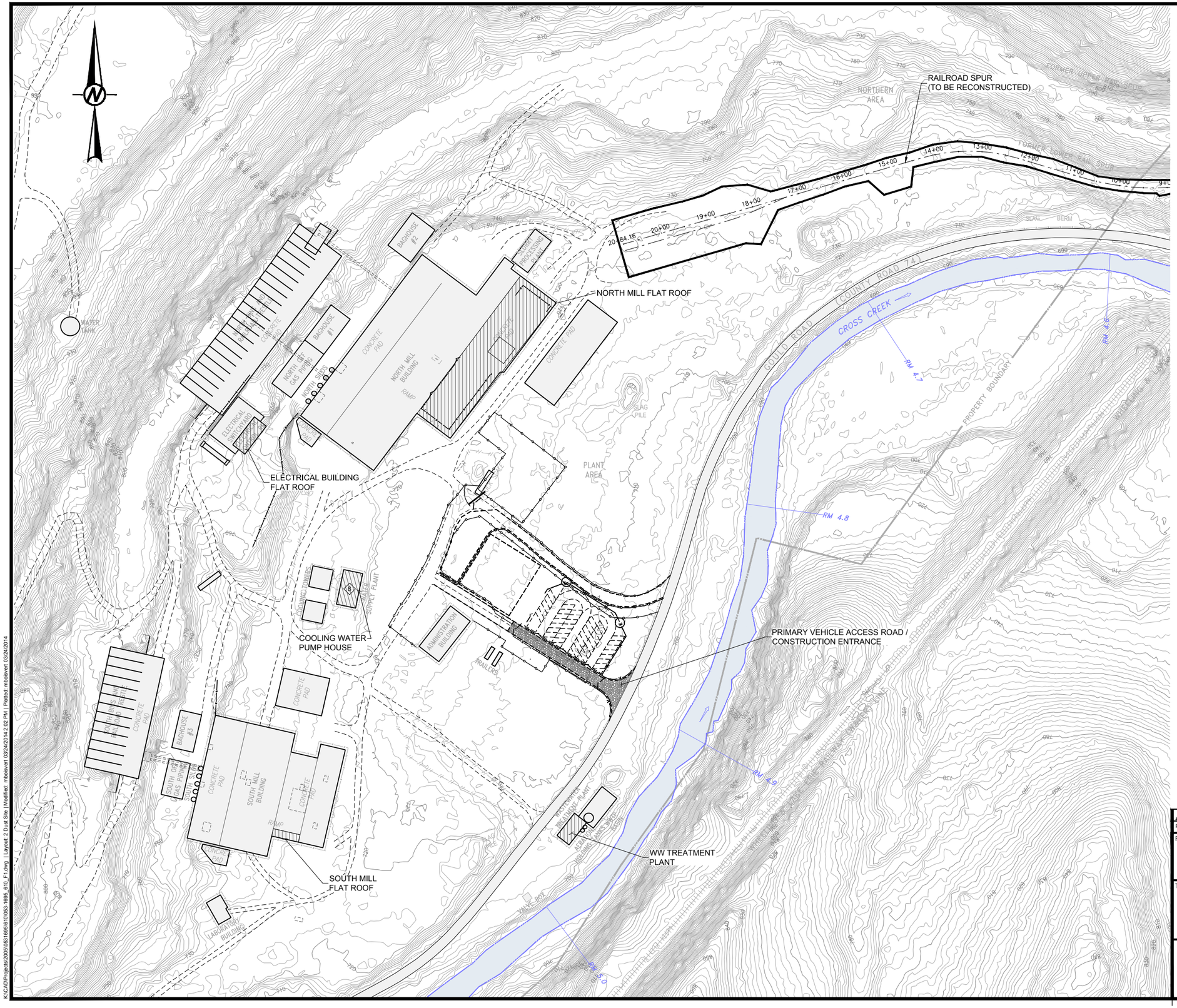
Notes:
NA = Not applicable
[1] Hexavalent chromium will be prepared using EPA 3060A, which will include the measurement of oxidation-reduction potential (ORP) as well as pH. The samples will be maintained on ice or chilled in the laboratory to stay within the acceptable total holding time for hexavalent chromium of 28 days. The laboratory has a technical holding time requirement of analyzing the sample within 24 hours after preparation.
[2] The 7199A method relies on appropriate digestion of the solid into a liquid matrix that retains the hexavalent chromium and the trivalent chromium. The 7199A method allows subsequent quantification of hexavalent chromium by colorimetric technique after separation on an ion chromatograph.

5.0 REFERENCES

Golder Associates Inc. (Golder). 2012. Interim Action Workplan. Former Satralloy Site, Jefferson County, Ohio. November 15.

Golder. 2013. Preliminary Evaluation Report and Remedial Investigation/Feasibility Study Workplan. Former Satralloy Site, Jefferson County, Ohio. May 8.

FIGURE



LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- EXISTING FENCE
- EXISTING SHEET PILE WALL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- FENCE (TEMPORARY)
- FENCE (PERMANENT)
- FLAT ROOF WITH SATURATED DUST

NOTES

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET
   VERTICAL DATUM: NAVD 88 (EST. 1991)
   CONTOUR INTERVAL: 2 FT
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS. ADDITIONAL SITE FEATURES APPROXIMATED, BASED ON HISTORIC DRAWINGS FOUND IN FILES AT THE SITE.
2. BUILDINGS, ROADS AND RAILROADS ARE APPROXIMATE AND WERE DIGITIZED FROM AERIAL PHOTOGRAPHS, DATED 2003, PROVIDED BY JEFFERSON COUNTY ENGINEERS OFFICE.
3. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006. MODIFIED TO REMOVE FORMER RAIL SPUR CORRIDORS.
4. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
5. THE RIVER MILE MARKERS SHOWN FOR CROSS CREEK HEREON WERE VIA A GEODATABASE AVAILABLE ON THE OHIO STATE DNR WEBSITE, JUNE 2012.

0 100 200
SCALE FEET

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
1	01/24/14	ISSUED FOR REVIEW	FSS	SES	FSS	LH

PROJECT
FORMER SATRALLOY SITE

TITLE
FLAT ROOFS WITH SATURATED DUST

Golder Associates

PROJECT No.	053-1695610	FILE No.	053-1695_610_F1
		SCALE	AS SHOWN
		FIGURE	2

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