TECHNICAL MEMORANDUM

DATE May 26, 2022

TO Barbara Nielsen Cyprus Amax Minerals Company

CC

FROM Jamie Bailey **EMAIL** jamie.bailey@wsp.com

LOWLAND SLAG INVESTIGATION

Dear Mrs. Nielsen,

Golder Associates USA Inc. (Golder) is pleased to provide this technical memorandum to Cyprus Amax Minerals Company (CMAC), for the completion of the Lowland Slag Investigation (LSI) at the Former Satralloy Site located in Mingo Junction, Ohio (the Site) between March 9 and 10, 2022.

INTRODUCTION

The purpose of the LSI was to address data gaps with respect to the vertical extent of buried slag located in the Lowland areas at the Site. This technical memorandum summarizes the work completed and data acquired during the LSI.

BACKGROUND

Soil & slag investigation work historically performed at the Site, including test pits and boreholes, showed varying vertical extent of slag located in the Lowland areas at the Site. Upon review of this historic information, it was noted that data gaps existed in a number of locations located across the Lowland areas. Therefore, CMAC decided to proceed with the work. Outputs form this effort will be shared with Golder design engineers so they may include the findings into their interim action design plan and specifications. The Lowland slag is scheduled for future relocation to the upland mine area as a part of the planned interim actions for the Site.

TEST PIT LOCATIONS

On March 9 and 10, 2022, Jamie Bailey, Sr. Consultant, Geologist with Golder supervised Remedial Construction Services (RECON) while they excavated 11 pre-selected test pits at the Site in the following areas:

- Slag Area 1 – This southern-most Area is located generally adjacent to the north of County Road 74 in the southern portion of the Lowland area of the Site.

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1335 Dublin Road, Suite 126-D, Columbus, Ohio, USA 43215 T: +1 614 486-1700 F: +1 614 486-1701

- Slag Area 2 – Located in the southern portion of the Lowland area, southeast of the South Mill Building and adjacent to the northwest of County Road 74.
- Slag Area 3 – Located generally adjacent to the south of Slag Area 2 in the southern portion of the Lowland area.
- Slag Area 4 – Located southwest of the South Mill Building, adjacent to the new haul road in the southern portion of the Lowland area of the Site.
- Slag Area 5 – This Area is located northeast of Slag Area 1 also adjacent to the north of County Road 74 in the southern portion of the Lowland area of the Site.
- Slag Area 6 – This Area was omitted during the planning stages of the LSI.
- Slag Area 7 – This Area is located adjacent to the west, behind the South Mill Building.
- Slag Area 8 – This Area is located adjacent to the northwest, behind the North Mill Building.
- Sludge Pit 1&2 – This Area is located northeast of Slag Area 5, adjacent to the north of County Road 74 in the southern portion of the Lowland area of the Site.
- Sludge Pit 3&4 – This Area is located adjacent to the northeast of Sludge Pit 1&2. This Area was not originally listed in the LSI; however, because of access issues as discussed below, one test pit was excavated in this area as a replacement for Slag Area 3.

Test pits were excavated utilizing a Caterpillar (CAT) 320 excavator until one of three following situations was met: native soil was encountered, a maximum depth of 20-feet below ground surface (bgs), or maximum reach of the excavator. Test pits were generally a bucket width wide or wide enough to maintain side wall stability. Materials excavated were placed around the transect in such a manner to prevent entrance by field personnel into the excavation while open. Test pits were backfilled immediately with excavated materials and compacted with the excavator bucket. A CAT 953K loader was utilized to regrade and stabilize the test pits. Above referenced Areas are depicted on Figure 1, Slag and Sludge Pit Area Test Pits 2022 – attached to this document.

TEST PIT FIELD OBSERVATIONS

The following is a summary of observations made during the LSI activities performed at the Site between March 9-10, 2022:

- Slag Area 1 – Two test pits, TP-1-West and TP-1-East, identified slag at depths of (1-2') and (1-4.5'), respectively. Native soils were encountered at depths of 2' and 4.5', respectively. Test pits were conducted on the west and east sides of the access road to not disturb the access road and create unsafe travel for other ongoing work in the area. Trees located in Slag Area 1 required the initial desired test pit location to be moved a few feet.
- Slag Area 2 – One test pit, TP-2, was completed in this area. TP-2 did not identify slag; however, a very hard layer from (0.5-3') bgs was encountered and is believed to be similar in composition to materials located in the former Ore Bins. Native soil was encountered at 3' bgs.

- Slag Area 3 – Located generally adjacent to the south of Slag Area 2 in the southern portion of the Lowland area. Test pits could not be completed in this area due to access limitations.
- Slag Area 4 – Two test pits, TP-4-North and TP-4-South, were completed in this area near the Haul Road. Slag was not encountered in either of the test pits. Native soils were observed to the termination depth, 20', of both test pits.
- Slag Area 5 – One test pit, TP-5, was completed in this area. Slag was observed from just below the topsoil ground surface to 4' bgs. Native soils were encountered at 4' bgs.
- Slag Area 7 – This Area is located behind the South Mill Building. Test pits were not conducted here because of ongoing demolition of the South Mill Building.
- Slag Area 8 – Two test pits, TP-8-North and TP-8-South, were completed behind the North Mill Building terminating at depths of 17' bgs. A mixture of soil with slag fill, different from existing slag on site, was encountered from (3-17') bgs in TP-8-North and from (1-16') bgs in TP-8-South. Native soil was encountered at 16' bgs in TP-8-South. Native soil was not encountered in TP-8-North at the maximum reach of the excavator. Slag percent in fill varied between TP-8-North and TP-8-South with approximately 2% and 25% by volume, respectively.
- Former Sludge Pits 1&2 – Two test pits, TP-SP-1 and TP-SP-2 were conducted in this area to depths of 15' bgs and 13' bgs, respectively. Dark gray, fine-grained, process residuals (previously interpreted as sludge) were identified from the ground surface and graded to light gray fine-grained, process residuals from 8' bgs to 15' bgs in TP-SP-1. Native soil was not encountered in TP-SP-1 at the maximum reach of the excavator. Dark gray, fine-grained, process residuals were identified from the ground surface to 11.5' bgs when native soil was encountered in TP-SP-2.
- Former Sludge Pit 3&4 – One test pit, TP-SP-4 was conducted in this area to a depth of 5' bgs. Dark gray, fine-grained, process residuals were identified from the ground surface to 4' bgs. Native soil was encountered at 4' bgs.

Test pit logs are included as Attachment A to this document.

ENVIRONMENTAL SAMPLING

The slag observed in TP-8-North and TP-8-South visually looked different than the existing slag located at the Site. Compared to Site slag, the material identified at TP-8-South appeared much darker and more conglomerate in composition with significant iron staining. One sample of the slag from TP-8-South was collected and shipped on ice, under chain of custody (COC) to Eurofins Canton, in Barberton, Ohio. The slag sample from TP-8-South was analyzed for COPC Metals by USEPA Method 6010D. Particle reduction was completed on the sample prior to sample analysis. Sample analysis results of the slag sampled at TP-8-South are summarized in Table 1.

Table 1 – TP-8-South Analytical Results

Parameter	TP-8-South (3-16') 3/10/2022 Mg/kg
Aluminum	33000 F2
Antimony	< 120 F1
Arsenic	< 99 F1
Cadmium	< 25
Chromium	27
Cobalt	37
Copper	< 25
Iron	440000 F2
Lead	< 120
Manganese	7400
Nickel	27 J
Selenium	< 120
Silver	< 25 F1
Thallium	< 120
Titanium	870
Vanadium	61 J
Zinc	< 120

Analytical results of the slag sample from TP-8-South are not consistent with the analytical results of existing slag on Site. Metal concentrations of Chromium, Iron, Manganese, and Titanium detected in the TP-8-South sample are significantly different from average concentrations detected in Site slag samples collected during the RI, confirming this slag material was not generated by the same processes used at the Site. TP-8-South total chromium is 27 times lower than the average identified in Site slag (see RI Table 4-1.1C, Slag Analytical Results). TP-8-South Iron is 34 times higher than the average Site slag concentration, and 7 times higher than the Site slag maximum detected in slag. Manganese and Titanium concentrations in TP-8-South are 13-17 times higher than the respective average Site slag concentrations. However, the data do not indicate any problem with consolidating the material with other Site slag.

The analytical report is included as Attachment B to this document.

CLOSING

We appreciate the opportunity to provide continuing support to the CAMC team. If you have any questions or are in need of additional information, please contact John Wise.

Sincerely,

Golder Associates Inc.

Jamie E. Bailey
Sr. Consultant, Geologist

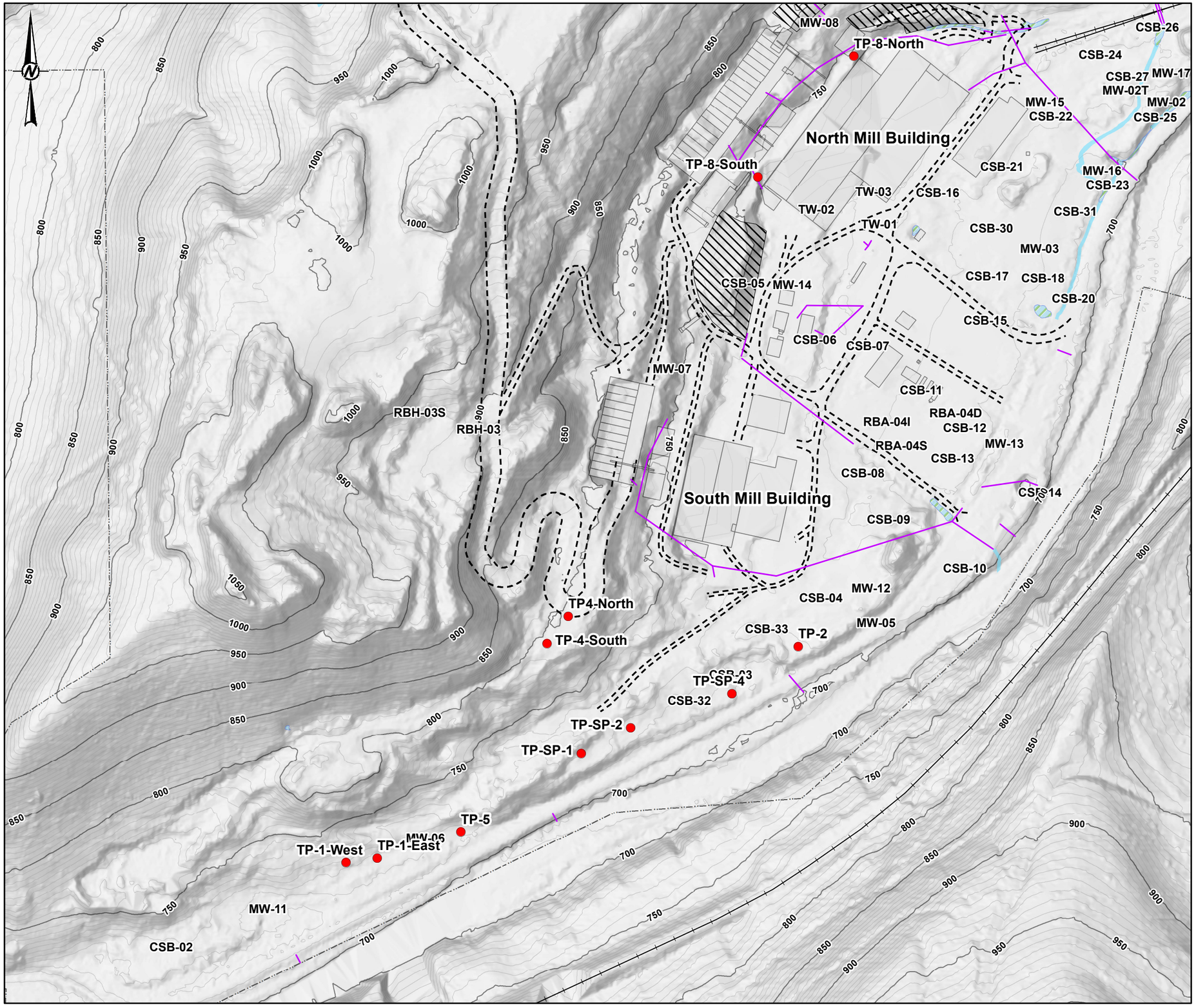
John Wise
Senior Consultant

JEB/JW

Distribution: [Click here and type distribution list]

Attachments Figure 1 – Slag and Sludge Pit Area Test Pits 2022
Attachment A – Test Pit Logs
Attachment B – Analytical Report

FIGURE



LEGEND

- SLAG TEST PITS
- STORM PIPELINE
- CROSS CREEK ROAD
- RAILROAD
- BORROW AREA
- EXISTING FACILITY
- PROPERTY BOUNDARY
- TRIBUTARY
- WETLAND
- ELEVATION CONTOUR (5-FT INTERVAL)
- ELEVATION CONTOUR (50-FT INTERVAL)

0 250 500

1 " = 250 FT FEET

NOTE(S)

1. GOLDER ASSOCIATES USA INC. (MONITORING WELL, SEEP LOCATION, SURFACE WATER LOCATION, SAMPLE LOCATION, CSB LOCATION, PROPOSED TRANSECT, SLAG AREA, SLUDGE POND AREA, FACILITY/PROPERTY BOUNDARY, BORROW AREA, RAILROAD, ROADS, MINE WORKINGS, PROPERTY BOUNDARY, SLURRY TOWER, SLURRY PIPE, STORM PIPE, TRIBUTARY, WETLAND, TOPOGRAPHIC CONTOUR)
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE OHIO NORTH FIPS 3401 FEET

CLIENT
CYPRUS AMAX MINERALS COMPANY

PROJECT
FORMER SATRALLOY SITE

TITLE
SLAG AND SLUDGE AREA TEST PITS 2022

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-04-25
DESIGNED	TL
PREPARED	TL
REVIEWED	BI/JB
APPROVED	JW

PROJECT NO.	PHASE	REV.	FIGURE
1239330906	600	A	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

PATH: G:\Freeport\Former_Satralloy\99_PROJECTS\1239330906_Satralloy\600\02_PRODUCTION\MXD\FIGURES\RevA\1239330906_600_001_F01_RevA_SlagArea_TestPits.mxd PRINTED ON: 2022-04-25 AT 3:24:22 PM

ATTACHMENT A
TEST PIT LOGS

RECORD OF TEST PIT: TP-1-East

CLIENT:	Cyprus Amax Minerals Company	DATE:	March 09, 2022	GROUND ELEV:	717.2 ft
PROJECT:	Former Satralloy Site			COORDINATES:	N: 238203.4 ft E: 2477362.6 ft
PROJECT NO:	1239330906	CONTRACTOR:	RECON	COORD SYS:	SP OH North FIPS 3401 Ft
LOCATION:	Jefferson County OH			HORZ DATUM:	NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0 716.2			
1			SLAG-FILL - (GW) GRAVEL, fine to coarse, well graded, angular, trace coarse sand, trace non plastic fines; very light orange white to pale orangish brown; strong Slag, 20% by volume, subangular to angular, Slag cobbles/boulders; cohesive, moist, hard.	GW		1.0 715.2			
2			(CL) SILTY CLAY, medium plasticity, trace medium to coarse sand; light brown; cohesive, w ~ PL, stiff.	CL		2.0 714.2			
3			End of hole at 3.00 ft.						
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width

LOGGED: Jamie Bailey DATE: Mar 09, 2022

CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-1-West

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 09, 2022
CONTRACTOR: RECON

GROUND ELEV: 724.2 ft
COORDINATES: N: 238191.9 ft E: 2477282.5 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0 / 723.2			
1			SLAG-FILL - (GW) GRAVEL, fine to coarse, well graded, angular, trace coarse sand, trace non plastic fines; very light orange white to pale orangish brown; strong Slag, 20% by volume, subangular to angular, Slag cobbles/boulders; cohesive, moist, hard.	GW		1.0 / 719.7			
4			(CL) SILTY CLAY, medium plasticity, trace medium to coarse sand; light brown; cohesive, w ~ PL, stiff.	CL		4.5 / 719.2			
5			End of hole at 5.00 ft.						

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 09, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-2

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 10, 2022
CONTRACTOR: RECON

GROUND ELEV: 719.0 ft
COORDINATES: N: 238744.7 ft E: 2478439.7 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0			
1			FILL - (SW) gravelly SAND, fine to coarse, well graded, fine to coarse rounded to angular gravel, trace non plastic fines; dark gray with light gray, strong cementation; Ore/byproduct; hard.	SW		718.5 0.5			
2									
3						716.0			
4			(CH) CLAY, high plasticity, some fine to medium sand, trace fine rounded gravel; brownish orange, changes to gray @12'; cohesive, w ~ PL, stiff.	CH		3.0			
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20			End of hole at 20.00 ft.			699.0			

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 10, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-4-North

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 09, 2022
CONTRACTOR: RECON

GROUND ELEV: 798.9 ft
COORDINATES: N: 238822.0 ft E: 2477851.6 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0 797.9			
1			FILL - (GW) sandy GRAVEL, coarse, well graded, rounded, medium to coarse sand, trace non plastic fines; grayish brown, BALLAST; 50% by volume, subangular to angular cobbles/boulders; non-cohesive, moist.	GW		1.0 795.9			
3			(CL) sandy SILTY CLAY, medium plasticity, fine to medium sand; brown; cohesive, w ~ PL, firm.	CL		3.0 792.9			
6			End of hole at 6.00 ft.						

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 09, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-4-South

CLIENT:	Cyprus Amax Minerals Company	START DATE:	March 09, 2022	GROUND ELEV:	799.9 ft
PROJECT:	Former Satralloy Site	END DATE:	March 10, 2022	COORDINATES:	N: 238752.3 ft E: 2477796.9 ft
PROJECT NO:	1239330906	CONTRACTOR:	RECON	COORD SYS:	SP OH North FIPS 3401 Ft
LOCATION:	Jefferson County OH			HORZ DATUM:	NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0 798.9			
1			(CL) sandy SILTY CLAY, medium plasticity, medium to coarse sand; dark brown; 5% by volume, subangular, Sandstone cobbles/boulders; cohesive, moist.	CL		1.0			
17						782.9			
			End of hole at 17.00 ft.						

REV:

GOLDER

DIMENSIONS: 6.0 ft length x 3.0 ft width

LOGGED: Jamie Bailey DATE: Mar 09, 2022

CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-5

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 09, 2022
CONTRACTOR: RECON

GROUND ELEV: 711.0 ft
COORDINATES: N: 238270.2 ft E: 2477576.2 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	TOPSOIL.			0.0			
1–4			SLAG-FILL - (GW) GRAVEL and SAND, fine to coarse, well graded, rounded to angular, and fine to coarse SAND, trace non plastic fines; light gray with banded white; very strong Slag, 40% by volume, subangular to angular, Slag cobbles/boulders; non-cohesive, moist, dense.	GW		710.7 0.2 707.0			
4–5			(CL) SILTY CLAY, medium plasticity, trace medium to coarse sand; w ~ PL, stiff.	CL		4.0 706.0			
5			End of hole at 5.00 ft.						

REV:

GOLDER

DIMENSIONS: 7.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 09, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-8-North

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 10, 2022
CONTRACTOR: RECON

GROUND ELEV: 747.0 ft
COORDINATES: N: 240254.8 ft E: 2478582.1 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	CONCRETE; Crushed concrete from silo demo.			0.0 / 746.0			
1			MIXTURE of SOIL and COBBLES/BOULDERS - FILL - (GC) sandy CLAYEY GRAVEL, coarse, subangular to angular, non plastic fines, coarse sand; gray, no staining, no odor; strong sandstone, 5% by volume, subrounded to angular, Slag cobbles/boulders; wet, loose.	GC		1.0 / 744.0			
3			FILL with SLAG - (CL) sandy SILTY CLAY, low plasticity, coarse sand, trace coarse rounded to angular gravel; dark gray to light bluish gray; Slag, 2% by volume, subangular to angular, Slag cobbles/boulders; cohesive, moist, stiff.	CL		3.0 / 730.0			
17			End of hole at 17.00 ft.						

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 10, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-8-South

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 10, 2022
CONTRACTOR: RECON

GROUND ELEV: 742.9 ft
COORDINATES: N: 239945.3 ft E: 2478336.2 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	CONCRETE; Concrete FILL from demo of silos.			0.0 741.9			
1			SLAG-MIXTURE of SOIL and ROCK - FILL - (GW-GC) GRAVEL and SAND, coarse, well graded, rounded to subrounded, and coarse SAND, some non plastic fines; dark gray and brown; Slag, 25% by volume, subangular to angular, Slag cobbles/boulders; non-cohesive, dry to moist, hard.			1.0	1-17	GS	
16			(CL) SILTY CLAY, medium plasticity, some fine to medium sand; brownish gray; cohesive, w ~ PL, firm.	CL		726.9 16.0 725.9			
17			End of hole at 17.00 ft.						
20									

REV:

GOLDER

DIMENSIONS: 5.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 10, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-SP-1

CLIENT:	Cyprus Amax Minerals Company	DATE:	March 09, 2022	GROUND ELEV:	730.3 ft
PROJECT:	Former Satralloy Site			COORDINATES:	N: 238470.7 ft E: 2477884.5 ft
PROJECT NO:	1239330906	CONTRACTOR:	RECON	COORD SYS:	SP OH North FIPS 3401 Ft
LOCATION:	Jefferson County OH			HORZ DATUM:	NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	SLUDGE FILL - (ML) SILT, non plastic, trace coarse gravel; dark gray, friable, no staining, no odor; non-cohesive, moist, compact, (Process Residuals).	ML		0.0			
						722.3			
8			SLUDGE FILL - (ML) SILT, non plastic, trace coarse gravel; light gray, friable, no staining, no odor; non-cohesive, moist, compact, (Process Residuals).			8.0			
						715.3			
15			End of hole at 15.00 ft. Maximum reach of excavator						

REV:

GOLDER

DIMENSIONS: 10.0 ft length x 3.0 ft width

LOGGED: Jamie Bailey DATE: Mar 09, 2022

CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-SP-2

CLIENT: Cyprus Amax Minerals Company
PROJECT: Former Satralloy Site
PROJECT NO: 1239330906
LOCATION: Jefferson County OH

DATE: March 14, 2022
CONTRACTOR: RECON

GROUND ELEV: 721.1 ft
COORDINATES: N: 238536.6 ft E: 2478010.7 ft
COORD SYS: SP OH North FIPS 3401 Ft
HORZ DATUM: NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	SLUDGE FILL - (ML) SILT, non plastic, trace coarse gravel; dark gray, friable, no staining, no odor; non-cohesive, moist, compact, (Process Residuals).	ML		0.0			
11						709.6			
11			(CH) CLAY, high plasticity, trace fine rounded gravel; orangish brown; cohesive, moist, firm.	CH		11.5			
13						708.1			
13			End of hole at 13.00 ft.						

REV:

GOLDER

DIMENSIONS: 10.0 ft length x 3.0 ft width
LOGGED: Jamie Bailey DATE: Mar 14, 2022
CHECKED: Bob Ireson DATE: Apr 19, 2022

RECORD OF TEST PIT: TP-SP-4

CLIENT:	Cyprus Amax Minerals Company	DATE:	March 09, 2022	GROUND ELEV:	712.3 ft
PROJECT:	Former Satralloy Site			COORDINATES:	N: 238624.1 ft E: 2478270.1 ft
PROJECT NO:	1239330906	CONTRACTOR:	RECON	COORD SYS:	SP OH North FIPS 3401 Ft
LOCATION:	Jefferson County OH			HORZ DATUM:	NAD83 VERT DATUM: NAVD88

DEPTH (ft)	EQUIPMENT	METHOD	MATERIAL PROFILE: DESCRIPTION	USCS	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	ADDITIONAL OBSERVATIONS
0	CAT 320	Excavation	SLUDGE FILL - (ML) SILT, non plastic, trace fine to coarse gravel; dark gray, friable; non-cohesive, moist, compact, (Process Residuals).	ML		0.0			
						708.3			
4			(CH) CLAY, high plasticity, trace fine to medium sand; orangish brown; cohesive, w ~ PL, stiff.	CH		4.0			
5			End of hole at 5.00 ft.			707.3			

REV:

GOLDER

DIMENSIONS: 10.0 ft length x 3.0 ft width

LOGGED: Jamie Bailey DATE: Mar 09, 2022

CHECKED: Bob Ireson DATE: Apr 19, 2022

ATTACHMENT B

ANALYTICAL REPORT

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-163712-1
Client Project/Site: Former Satralloy Lowland Slag Investigation

For:
Golder Associates Inc.
1335 Dublin Road
Suite 126-D
Columbus, Ohio 43215

Attn: Mr. Bob Ireson

Kris Brooks

Authorized for release by:
3/29/2022 2:13:14 PM

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Table of Contents

Definitions/Glossary

Client: Golder Associates Inc. Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Golder Associates Inc. Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Job ID: 240-163712-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-163712-1

Comments
The SW846 Method 6010D Metals (ICP) and ASTM Method D2216-80 Percent Solids analyses were performed at the Eurofins Sacramento laboratory.

Receipt
The sample was received on 3/15/2022 5:30 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2º C.

Metals
Methods 200.7 Rev 4.4, 6010C, 6010D: The following sample was diluted due to the presence of an interferent. TP-8-SOUTH (3-16") (240-163712-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: Golder Associates Inc.
Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	TAL CF
Moisture	Percent Moisture	EPA	TAL CF
Part Size Red	Particle Size Reduction Preparation	None	TAL CAN
3050B	Preparation, Metals	SW846	TAL CF

Protocol References:

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Sample Summary

Client: Golder Associates Inc.
Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-163712-1	TP-8-SOUTH (3-16")	Solid	03/10/22 10:30	03/15/22 17:30

Detection Summary

Client: Golder Associates Inc.
Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Client Sample ID: TP-8-SOUTH (3-16")
Lab Sample ID: 240-163712-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	33000	F2	620	180	mg/Kg	25	☼	6010D	Total/NA
Cobalt	37		25	7.4	mg/Kg	25	☼	6010D	Total/NA
Chromium	27		25	8.1	mg/Kg	25	☼	6010D	Total/NA
Iron	440000	F2	1200	320	mg/Kg	25	☼	6010D	Total/NA
Manganese	7400		62	15	mg/Kg	25	☼	6010D	Total/NA
Nickel	27	J	62	21	mg/Kg	25	☼	6010D	Total/NA
Titanium	870		62	18	mg/Kg	25	☼	6010D	Total/NA
Vanadium	61	J	62	20	mg/Kg	25	☼	6010D	Total/NA
PSR sample generated	Done				NONE	1		Part Size Red	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-8-SOUTH (3-16")

Lab Sample ID: 240-163712-1
Date Collected: 03/10/22 10:30
Matrix: Solid
Date Received: 03/15/22 17:30
Percent Solids: 91.3

Method: 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<11	F1	25	11	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Aluminum	**33000**	**F2**	620	180	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Arsenic	<54	F1	99	54	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Cadmium	<9.6		25	9.6	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Cobalt	**37**		25	7.4	mg/Kg	☼	03/19/22 09:30	03/24/22 12:57	25
Chromium	**27**		25	8.1	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Copper	<15		25	15	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Iron	**440000**	**F2**	1200	320	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Manganese	**7400**		62	15	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Nickel	**27**	**J**	62	21	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Lead	<47		120	47	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Antimony	<47	F1	120	47	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Selenium	<72		120	72	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Titanium	**870**		62	18	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Thallium	<59		120	59	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Vanadium	**61**	**J**	62	20	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25
Zinc	<52		120	52	mg/Kg	☼	03/19/22 09:30	03/23/22 11:29	25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.7**		0.1	0.1	%			03/21/22 13:11	1
Percent Solids	**91.3**		0.1	0.1	%			03/21/22 13:11	1

Method: Part Size Red - Particle Size Reduction Preparation

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PSR sample generated	**Done**				NONE			03/17/22 13:15	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 310-347064/1-A
Matrix: Solid
Analysis Batch: 347753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 347064

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.27		0.89	0.27	mg/Kg		03/19/22 09:30	03/24/22 12:49	1

Lab Sample ID: LCS 310-347064/2-A
Matrix: Solid
Analysis Batch: 347753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 347064

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	96.7	91.6		mg/Kg		95	80 - 120

Lab Sample ID: 240-163712-1 MS
Matrix: Solid
Analysis Batch: 347503

Client Sample ID: TP-8-SOUTH (3-16")
Prep Type: Total/NA
Prep Batch: 347064

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	<11	F1	98.0	110		mg/Kg	☼	112	75 - 125
Aluminum	33000	F2	196	26100	4	mg/Kg	☼	-3624	75 - 125
Arsenic	<54	F1	196	250	F1	mg/Kg	☼	128	75 - 125
Cadmium	<9.6		98.0	102		mg/Kg	☼	104	75 - 125
Chromium	27		98.0	130		mg/Kg	☼	105	75 - 125
Copper	<15		196	222		mg/Kg	☼	113	75 - 125
Iron	440000	F2	196	467000	4	mg/Kg	☼	13480	75 - 125
Manganese	7400		98.0	6940	4	mg/Kg	☼	-454	75 - 125
Nickel	27	J	196	230		mg/Kg	☼	103	75 - 125
Lead	<47		196	189		mg/Kg	☼	96	75 - 125
Antimony	<47	F1	196	<47	F1	mg/Kg	☼	0	75 - 125
Selenium	<72		392	387		mg/Kg	☼	99	75 - 125
Titanium	870		196	1030	4	mg/Kg	☼	81	75 - 125
Thallium	<59		196	220		mg/Kg	☼	112	75 - 125
Vanadium	61	J	98.0	168		mg/Kg	☼	109	75 - 125
Zinc	<52		196	197		mg/Kg	☼	101	75 - 125

Lab Sample ID: 240-163712-1 MS
Matrix: Solid
Analysis Batch: 347753

Client Sample ID: TP-8-SOUTH (3-16")
Prep Type: Total/NA
Prep Batch: 347064

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	37		98.0	145		mg/Kg	☼	110	75 - 125

Lab Sample ID: 240-163712-1 MSD
Matrix: Solid
Analysis Batch: 347503

Client Sample ID: TP-8-SOUTH (3-16")
Prep Type: Total/NA
Prep Batch: 347064

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	<11	F1	96.2	128	F1	mg/Kg	☼	133	75 - 125	15	20
Aluminum	33000	F2	192	35700	4 F2	mg/Kg	☼	1300	75 - 125	31	20
Arsenic	<54	F1	192	266	F1	mg/Kg	☼	138	75 - 125	6	20
Cadmium	<9.6		96.2	112		mg/Kg	☼	117	75 - 125	10	20
Chromium	27		96.2	133		mg/Kg	☼	111	75 - 125	3	20
Copper	<15		192	240		mg/Kg	☼	125	75 - 125	8	20

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 240-163712-1 MSD **Client Sample ID: TP-8-SOUTH (3-16")**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 347503 **Prep Batch: 347064**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	440000	F2	192	325000	4 F2	mg/Kg	☼	-6026 1	75 - 125	36	20
Manganese	7400		96.2	6440	4	mg/Kg	☼	-979	75 - 125	7	20
Nickel	27	J	192	243		mg/Kg	☼	112	75 - 125	5	20
Lead	<47		192	226		mg/Kg	☼	117	75 - 125	18	20
Antimony	<47	F1	192	<46	F1	mg/Kg	☼	0	75 - 125	NC	20
Selenium	<72		385	457		mg/Kg	☼	119	75 - 125	17	20
Titanium	870		192	1180	4	mg/Kg	☼	161	75 - 125	14	20
Thallium	<59		192	240		mg/Kg	☼	125	75 - 125	9	20
Vanadium	61	J	96.2	160		mg/Kg	☼	103	75 - 125	5	20
Zinc	<52		192	221		mg/Kg	☼	115	75 - 125	11	20

Lab Sample ID: 240-163712-1 MSD **Client Sample ID: TP-8-SOUTH (3-16")**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 347753 **Prep Batch: 347064**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cobalt	37		96.2	135		mg/Kg	☼	102	75 - 125	7	20

Method: Moisture - Percent Moisture

Lab Sample ID: 240-163712-1 DU **Client Sample ID: TP-8-SOUTH (3-16")**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 347221

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	8.7			7.7		%				13	39
Percent Solids	91.3			92.3		%				1	10

QC Association Summary

Client: Golder Associates Inc.
Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Metals

Prep Batch: 347064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-163712-1	TP-8-SOUTH (3-16")	Total/NA	Solid	3050B	
MB 310-347064/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 310-347064/2-A	Lab Control Sample	Total/NA	Solid	3050B	
240-163712-1 MS	TP-8-SOUTH (3-16")	Total/NA	Solid	3050B	
240-163712-1 MSD	TP-8-SOUTH (3-16")	Total/NA	Solid	3050B	

Analysis Batch: 347503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-163712-1	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064
240-163712-1 MS	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064
240-163712-1 MSD	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064

Analysis Batch: 347753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-163712-1	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064
MB 310-347064/1-A	Method Blank	Total/NA	Solid	6010D	347064
LCS 310-347064/2-A	Lab Control Sample	Total/NA	Solid	6010D	347064
240-163712-1 MS	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064
240-163712-1 MSD	TP-8-SOUTH (3-16")	Total/NA	Solid	6010D	347064

General Chemistry

Analysis Batch: 347221

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-163712-1	TP-8-SOUTH (3-16")	Total/NA	Solid	Moisture	
240-163712-1 DU	TP-8-SOUTH (3-16")	Total/NA	Solid	Moisture	

Organic Prep

Analysis Batch: 520249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-163712-1	TP-8-SOUTH (3-16")	Total/NA	Solid	Part Size Red	

Lab Chronicle

Client: Golder Associates Inc. Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Client Sample ID: TP-8-SOUTH (3-16") Lab Sample ID: 240-163712-1

Date Collected: 03/10/22 10:30 **Matrix: Solid**
Date Received: 03/15/22 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	347221	03/21/22 13:11	SJN	TAL CF
Total/NA	Analysis	Part Size Red		1	520249	03/17/22 13:15	DRJ	TAL CAN

Client Sample ID: TP-8-SOUTH (3-16") Lab Sample ID: 240-163712-1

Date Collected: 03/10/22 10:30 **Matrix: Solid**
Date Received: 03/15/22 17:30 **Percent Solids: 91.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			347064	03/19/22 09:30	ACM2	TAL CF
Total/NA	Analysis	6010D		25	347503	03/23/22 11:29	CTB	TAL CF
Total/NA	Prep	3050B			347064	03/19/22 09:30	ACM2	TAL CF
Total/NA	Analysis	6010D		25	347753	03/24/22 12:57	CTB	TAL CF

Laboratory References:

TAL CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 240-163712-1
Project/Site: Former Satralloy Lowland Slag Investigation

Laboratory: Eurofins Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22 *
Connecticut	State	PH-0590	12-31-21 *
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22 *
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22 *
Kentucky (WW)	State	KY98016	12-31-22
Minnesota	NELAP	039-999-348	12-31-22
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	11-06-22
New York	NELAP	10975	03-31-22
Ohio	State	8303	02-23-23
Ohio VAP	State	CL0024	02-27-23
Oregon	NELAP	4062	02-27-23
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-21-14	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-23
West Virginia DEP	State	210	12-31-22

Laboratory: Eurofins Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-22
Georgia	State	IA100001 (OR)	09-29-22
Illinois	NELAP	200024	11-29-22
Iowa	State	007	12-01-21 *
Kansas	NELAP	E-10341	01-31-23
Minnesota	NELAP	019-999-319	12-31-22
Minnesota (Petrofund)	State	3349	04-06-23
North Dakota	State	R-186	09-29-22
Oregon	NELAP	IA100001	09-29-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

1-4/12

eurofins | Environment Testing America

Client Information	Sampler: J. Bailey	Lab PM: Brooks, Kris M	Carrier Tracking No(s): Courier	COC No: 240-92246-34349.1
Client Contact: Mr. Bob Ireson	Phone: (614) 486-1700	E-Mail: Kris.Brooks@Eurofinset.com	State of Origin: Ohio	Page: 1 of 1
Company: Golder Associates Inc.	PWSID:			Job #:

Address: 1335 Dublin Road Suite 126-D	Due Date Requested:
City: Columbus	TAT Requested (days): Standard
State, Zip: OH, 43215	Compliance Project: Δ Yes Δ No
Phone:	PO #: 123-9330906
Email: Bob_Ireson@golder.com	WO #:
Project Name: Satralloy Lowland Slag Investigation	Project #: 24009044
Site: Former Satralloy Site	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	COPC Metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:				I		
TP-8-South (3-16')	3/10/22	1030	G	S	N	N	X		

240-163712 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by:	3/15/22 1500	Golder		3.15.22 1500	
Relinquished by:	3.15.22 17:30			3-15-22 1730	EEINC
Relinquished by:					

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 163717
Canton Facility

Client Golder Site Name

Cooler Received on 3-15-22 Opened on 3-16-22

Cooler unpacked by: Mat

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF **-0.2** °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.2 °C
   IR GUN #IR-15 (CF **-0.7**°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

eurofins | Environment Testing America

240-163712 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Clinton

City/State: CITY Burlington | STATE IA | Project:

Receipt Information

Date/Time Received: DATE 3/18/22 | TIME 915 | Received By: PK

Delivery Type: ☐ UPS ☑ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☑ Yes	☐ No	*If yes* Cocler ID
Multiple Coolers?	☐ Yes	☑ No	*If yes* Cooler # _____ of _____
Cooler Custody Seals Present?	☐ Yes	☑ No	*If yes* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☑ No	*If yes* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☑ No	*If yes* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other._____ ☐ NONE

Thermometer ID: N | Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): – | Corrected Temp (°C): –

Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used	PL 500mL	
Uncorrected Temp (°C)	-0.3	
Corrected Temp (°C)	-0.3	

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e g , bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE. If yes, contact PM before proceeding If no, proceed with login

Additional Comments

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins Environment Testing Amer ca

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-149917 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@Eurofinset.com	State of Origin: Ohio	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note):		Job #: 240-163712-1
Address: 3019 Venture Way	Due Date Requested: 3/28/2022			
City: Cedar Falls	TAT Requested (days):			
State, Zip: IA, 50613				
Phone: 319-277-2401(Tel) 319-277-2425(Fax)	PO #:			
Email:	WO #:			
Project Name: Former Satralloy Site	Project #: 24009044			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010D/3050B COPC Metals List	Moisture/ Percent Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
TP-8-SOUTH (3-16") (240-163712-1)	3/10/22	10:30 Eastern		Solid			X	X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested. I, II III IV Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3-17-22 1528	ETA		3/18/22 0745	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Golder Associates Inc.

Job Number: 240-163712-1

Login Number: 163712
List Number: 2
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls
List Creation: 03/18/22 11:06 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	