
Subject	Addendum to the November 12, 2020 Geochemical Testing and Evaluation Memorandum	Project Name	Saunders Demonstration Mine
Attention	TTL, Inc. Twin Pines Minerals, LLC		
From	Robert ("B.T.") C. Thomas, M.S., Ph.D., Jacobs Engineering Group, Inc. (Jacobs)		
Date	July 12, 2021		
Copies to	Galloway & Lyndall LLP King & Spalding LLP		

Dr. James L. Kennedy, the State Geologist with the Georgia Environmental Protection Division (GA EPD) provided review comments of the Technical Response to Review Comments Provided by State Geologist & Supporting Documents (TTL, Inc., 2020). These comments were received as part of the Twin Pines Permit Coordination Document prepared by GA EPD on April 14, 2021. Comment 5.h. is specifically directed at the Geochemical Testing and Evaluation Memorandum prepared by Jacobs in November 2020. This addendum provides the data requested in that comment and during subsequent discussions between Dr. James L. Kennedy and Twin Pines Minerals, LLC. To address Dr James L. Kennedy's requests, Jacobs coordinated further laboratory analysis of samples from the Twin Pines Minerals, LLC Saunders Demonstration Mine site as detailed below.

Response to comment: *Please include a demonstration of Floridan aquifer groundwater chemistry versus local rainwater chemistry in the report.*

The initial SPLP testing conducted in 2020 used two end-member waters: 1) an aliquot of Floridan Aquifer water taken from a municipal well and 2) shallow groundwater collected from well OWB-2S within the proposed mine area. The initial SPLP testing was a blend of these two waters ranging from all Floridan Aquifer to all local shallow groundwater. A comparison of the analytical chemistry of 2020 samples from the Floridan Aquifer and the local shallow groundwater sampled from well OWB-2S, versus rainwater collected from the site in May 2021 is provided in the table below. In general, the three waters vary only in major cations (i.e., Ca, Mg, K, and Na) and anions (i.e., alkalinity, chloride, nitrate, and sulfate); there is no significant difference for almost all trace metals analyzed between the three waters. The one difference is mercury which is non-detect in the Floridan Aquifer, detected in the shallow groundwater at approximately 0.68 ng/L, but not quantifiable, and detected in the rainwater at approximately 4.2 ng/L, but not quantifiable. The other notable difference between the two groundwater samples and the rainwater sample is the pH with both groundwater samples having a slightly alkaline pH (7.5 and 7.3), while the rainwater sample is slightly acidic (pH 5.6). While a slightly more acidic pH can have an impact on the mobility of certain metals (e.g., aluminum), there is no buffering capacity in the rainwater and given

the high solids:water ratio of infiltrating rainwater relative to the deposited tailings, the impacts of a slightly acidic pH would be minimal.

As a verification, the SPLP extractions conducted in 2020 using end-member blends of Floridan Aquifer with local shallow groundwater were repeated using rainwater collected from the site on 05/06/2021 (as presented in Table 1). Results from the SPLP extraction are presented in Table 2 and in Figure 1. The data presented in Table 1 is repeated in Table 2 as the "blank" analysis for the SPLP. In general, the rainwater extractions yielded similar or lower metal concentrations in the leachate relative to both the shallow groundwater and Floridan Aquifer leach tests. One exception is aluminum which is leached at a slightly higher concentration in the rainwater SPLP relative to the other two waters tested. This is likely due to the pH sensitivity of aluminum; however, any aluminum mobilize in the unsaturated zone of the deposited tailings would reprecipitate in the saturated zone of the local shallow groundwater where the pH is closer to the minimum solubility for aluminum. Mercury is leached from the black humate sands at a level slightly higher with rainwater than the other leach waters, but black humate sands will not be part of the final tailings, which will be either humate isolates or post-processed sand. Moreover, the amount of mercury leached from the black humate sands by the rainwater is within the dynamic range of mercury leached from all samples tested and is within the expected natural variation within the samples.

In conclusion, we find that the chemistry of the local rainwater is comparable to the local shallow groundwater. The Floridan Aquifer water is slightly more mineralized than both waters. There is no major difference in the SPLP extractions when using rainwater versus either the Floridan Aquifer water or the local shallow groundwater. These results of these requested analysis support the conclusion in the original submittal that mobilization of trace metals will not occur following deposition of the mine tailings. Rainwater infiltration through the upper approximately 5 ft of unsaturated tailings will not leach any significant concentration of metals to the shallow groundwater and the tailings deposited in the saturated zone of the local shallow groundwater will not liberate metals from leaching by the shallow groundwater. Migration of trace metals within the local shallow groundwater of this proposed mine area will be within the limits of natural variation in metal concentrations already measured in the shallow groundwater.

Table 1. Comparison of Rainwater Chemistry versus Local Shallow Groundwater and Floridan Aquifer
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Analyte	Units	Floridan Aquifer		Shallow Groundwater		Rain Water	
Alkalinity, Bicarbonate	mg/L	170		12		12	I
Alkalinity, Carbonate	mg/L	5	U	5	U	5	U
Alkalinity, Total	mg/L	170		12		12	I
Aluminum	mg/L	0.02	U	0.08		0.2	U
Ammonia (N)	mg/L	0.2		0.33		0.41	
Antimony	mg/L	0.003	U	0.003	U	0.007	U
Arsenic	mg/L	0.008	U	0.0081	I	0.0005	U
Barium	mg/L	0.04		0.044		0.003	I
Beryllium	mg/L	0.002	U	0.002	U	0.002	U
Boron	mg/L	0.1	U	0.1	U	0.1	U
Bromide	mg/L	0.1	U	0.1	U	0.2	U
Cadmium	mg/L	0.0005	U	0.0005	U	0.001	U
Calcium	mg/L	68		1.7		3.9	
Chloride	mg/L	30		11		2	U
Chromium	mg/L	0.0082	I	0.0083	I	0.005	U
Cobalt	mg/L	0.001	U	0.001	U	0.001	U
Color	PCU	15		40		N/A	
Conductivity	umhos/cm	571		65		151	
Copper	mg/L	0.01	U	0.01	U	0.01	U
Cyanide	mg/L	0.0097	U	0.0097	U	0.004	U
DO Saturation %	%	109.7		103.9		8.92	
Fluoride	mg/L	0.37	I	0.05	U	0.2	U
Iron	mg/L	0.2	U	0.2	U	0.2	U
Lead	mg/L	0.0037	I	0.003	U	0.003	U
Magnesium	mg/L	29		1.2		0.66	
Manganese	mg/L	0.005	U	0.024		0.005	U
Mercury	ng/L	0.5	U	0.68	I	4.2	I
Molybdenum	mg/L	0.004	U	0.004	U	0.004	U
Nickel	mg/L	0.01	U	0.01	U	0.01	U
Nitrate (as N)	mg/L	0.069	I	0.05	U	0.61	I
Nitrite (as N)	mg/L	0.05	U	0.05	U	0.2	U

Analyte	Units	Floridan Aquifer		Shallow Groundwater		Rain Water	
ORP-2580BW	mV	90.7		116.3		N/A	
pH	SU	7.52		7.31		5.63	
Potassium	mg/L	2		0.5	U	0.5	U
Selenium	mg/L	0.04	U	0.04	U	0.0025	U
Silicon	mg/L	18		4.8		0.2	U
Silver	mg/L	0.008	U	0.008	U	0.001	U
Sodium	mg/L	24		8.6		0.96	I
Sulfate	mg/L	130		0.5	U	2	U
Temperature	°C	16.8		14.1		23.2	
Thallium	mg/L	0.01	U	0.01	U	0.01	U
Thorium	ug/L	0.36	U	0.073	U	0.5	U
Tin	mg/L	0.04	U	0.04	U	0.04	U
Titanium	mg/L	0.002	U	0.002	U	0.002	U
Total Dissolved Solids	mg/L	430		73		10	U
Total Hardness (as CaCO3)	mg/L	290		9.3		12	
Total Kjeldahl Nitrogen	mg/L	0.16		0.31		0.572	
Total Organic Carbon	mg/L	3.5	I	8.6		1.4	I
Total Phosphorus (as P)	mg/L	0.055	U	0.061	I	0.15	U
Total Suspended Solids	mg/L	2		6		N/A	
Turbidity	NTU	1.85		6.36		N/A	
Uranium	ug/L	0.35	U	0.07	U	0.4	U
Zinc	mg/L	0.05	U	0.05	U	0.05	U



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Table 2. Comparison of SPLP Test Results Using Rainwater, Local Shallow Groundwater, and Floridan Aquifer Water as Leach Solutions for Samples of Post-Processed Sands, Humate Isolates, and Black Humate Sands
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Analyte	Unit	Shallow Groundwater (SGW)		Floridan Aquifer (FA)		Rain Water (RW)		Post- Processed Sand (SGW)		Post- Processed Sand (FA)		Post- Processed Sand (RW)		Humate Isolates (SGW)		Humate Isolates (FA)		Humate Isolates (RW)		Black Humate Sand (SGW)		Black Humate Sand (FA)		Black Humate Sand (RW)	
Alkalinity, Bicarbonate	mg/L	12		170		12	I	24		160		17	I	160		180		18	I	10		64		38	
Alkalinity, Carbonate	mg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Alkalinity, Total	mg/L	12		170		12	I	24		170		17	I	160		180		18	I	10		64		38	
Aluminum	mg/L	0.08		0.02	U	0.2	U	0.12		0.4		0.66	I	0.26		0.38		0.91		0.18		0.093		1.7	
Ammonia (N)	mg/L	0.33		0.2		0.41		0.29		0.21		0.32		0.14		0.08	I	0.18		0.34		0.2		0.13	
Antimony	mg/L	0.003	U	0.003	U	0.007	U	0.003	U	0.003	U	0.007	U	0.003	U	0.003	U	0.007	U	0.003	U	0.003	U	0.007	U
Arsenic	mg/L	0.0081	I	0.008	U	0.0005	U	0.008	U	0.008	U	0.0005	U	0.008	U	0.008	U	0.0005	U	0.009	I	0.0091	I	0.0009	I
Barium	mg/L	0.044		0.04		0.003	I	0.044		0.034		0.0074		0.0045	I	0.011	I	0.024		0.042		0.027		0.019	
Beryllium	mg/L	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
Boron	mg/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	I	0.1	U	0.1	U	0.1	U	0.23	I
Bromide	mg/L	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.2	U	0.1	U	0.1	U	0.2	U
Cadmium	mg/L	0.0005	U	0.0005	U	0.001	U	0.0005	U	0.0005	U	0.001	U	0.0005	U	0.0005	U	0.001	U	0.0005	U	0.0005	U	0.001	U
Calcium	mg/L	1.7		68		3.9		4.6		64		3.2		78		160		2.1		1.8		38		1.9	
Chloride	mg/L	11		30		2	U	11		29		2	U	11		29		2	U	11		29		2.2	I
Chromium	mg/L	0.0083	I	0.0082	I	0.005	U	0.0095	I	0.0069	I	0.005	U	0.0071	I	0.016	I	0.005	U	0.005	U	0.005	U	0.005	U
Cobalt	mg/L	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Color	PCU	40		15		N/A		150		200		N/A		15000		20000		N/A		150		500		N/A	
Conductivity	umhos/cm	65		571		151		68		477		56		385		453		69		72		379		93	
Copper	mg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Cyanide	mg/L	0.0097	U	0.0097	U	0.004	U	0.0097	U	0.0097	U	0.004	U	0.0097	U	0.0097	U	0.004	J4U	0.0097	U	0.0097	U	0.004	U
DO Saturation %	%	103.9		109.7		8.92		102.5		101.4		7.78		92.2		98.4		8.25		100.7		104.9		7.52	
Fluoride	mg/L	0.05	U	0.37	I	0.2	U	0.05	U	0.29	I	0.2	U	0.05	U	0.05	U	0.2	U	0.05	U	0.05	U	0.2	U
Iron	mg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.23	I	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Lead	mg/L	0.003	U	0.0037	I	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Magnesium	mg/L	1.2		29		0.66		2.6		29		1.3		2.3		20		0.53		1.3		23		0.36	I
Manganese	mg/L	0.024		0.005	U	0.005	U	0.025		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.026		0.005	U	0.005	U
Mercury	ng/L	0.68	I	0.5	U	4.2	I	4.9		8.7		11		140		11		24		16		55		70	
Molybdenum	mg/L	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Nickel	mg/L	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Nitrate (as N)	mg/L	0.05	U	0.069	I	0.61	I	0.052	I	0.057	I	0.59	I	0.12	I	0.17	I	0.62	I	0.059	I	0.052	I	0.64	I
Nitrite (as N)	mg/L	0.05	U	0.05	U	0.2	U	0.05	U	0.05	U	0.2	U	0.05	U	0.05	U	0.2	U	0.05	U	0.05	U	0.2	U



Memorandum Addendum

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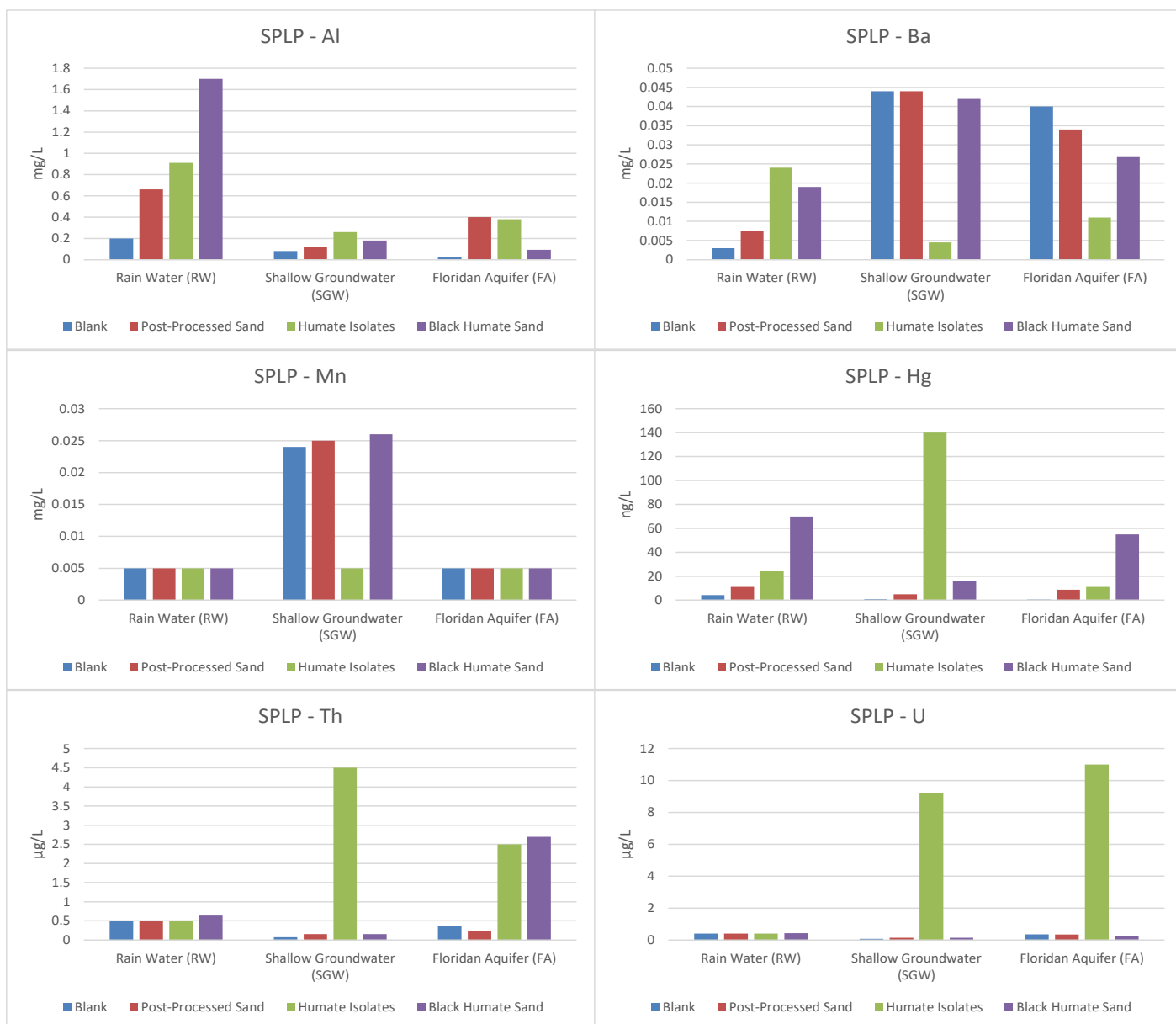


Figure 1. Comparison of SPLP Results Using Rainwater, Local Shallow Groundwater, and Floridan Aquifer Water
 July 2021 Addendum to the November 2020 Geochemical Testing and Evaluation Memorandum



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July 15, 2021

Jim Smith
TTL Inc.
4589 Val North Dr.
Valdosta, GA 31602

RE: Workorder: J2106879 Twin Pines Minerals SPLP 2021

Dear Jim Smith:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 21, 2021. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Jerry Allen'.

Jerry Allen - Project Manager
jallen@aellab.com

Enclosures

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SAMPLE SUMMARY

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID	Sample ID	Matrix	Date Collected	Date Received
J2106879002	SPLP Black Humate	Water	5/21/2021 00:00	5/21/2021 12:00
J2106879004	SPLP Post Process Sand	Water	5/21/2021 00:00	5/21/2021 12:00
J2106879006	SPLP Composite	Water	5/21/2021 00:00	5/21/2021 12:00
J2106879007	Rain Water	Water	5/21/2021 00:00	5/21/2021 12:00

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879002**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Black Humate**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	93		umhos/cm	1			6/8/2021 14:10	J^
Dissolved Oxygen	7.52		mg/L	1			6/8/2021 14:10	J^
Temperature	22.7		°C	1			6/8/2021 14:10	J^
pH	7.58		SU	1			6/8/2021 14:10	J^
METALS								
Analysis Desc: E1631 Analysis,Water			Preparation Method: EPA 1631 E					
			Analytical Method: EPA 1631 E					
Mercury	70		ng/L	10	20	5.0	6/4/2021 15:23	J
Analysis Desc: SW846 6010B Analysis,Water			Preparation Method: SW-846 3010A					
			Analytical Method: SW-846 6010					
Calcium	2.4		mg/L	1	0.80	0.20	6/16/2021 13:01	M
Magnesium	0.47		mg/L	1	0.40	0.10	6/16/2021 13:01	M
Total Hardness (as CaCO3)	8.0		mg/L	1			6/16/2021 13:01	M
Analysis Desc: SW846 6010B Analysis,Dissolved			Preparation Method: SW-846 3005A					
			Analytical Method: SW-846 6010,Dissolved					
Aluminum	1.7		mg/L	1	0.80	0.20	6/16/2021 13:15	M
Boron	0.23	I	mg/L	1	0.40	0.10	6/16/2021 13:15	M
Beryllium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:15	M
Calcium	1.9		mg/L	1	0.80	0.20	6/16/2021 13:15	M
Cadmium	0.0010	U	mg/L	1	0.0040	0.0010	6/16/2021 13:15	M
Cobalt	0.0010	U	mg/L	1	0.040	0.0010	6/16/2021 13:15	M
Chromium	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:15	M
Copper	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:15	M
Iron	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:15	M
Potassium	0.50	U	mg/L	1	2.0	0.50	6/16/2021 13:15	M
Magnesium	0.36	I	mg/L	1	0.40	0.10	6/16/2021 13:15	M
Manganese	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:15	M
Molybdenum	0.0040	U	mg/L	1	0.016	0.0040	6/16/2021 13:15	M
Sodium	15		mg/L	1	3.2	0.80	6/16/2021 13:15	M
Nickel	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:15	M
Lead	0.0030	U	mg/L	1	0.012	0.0030	6/16/2021 13:15	M
Antimony	0.0070	U	mg/L	1	0.28	0.0070	6/16/2021 13:15	M
Silicon	0.72	I	mg/L	1	0.80	0.20	6/16/2021 13:15	M^

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879002**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Black Humate**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Tin	0.040	U	mg/L	1	0.16	0.040	6/16/2021 13:15	M
Titanium	0.043		mg/L	1	0.0080	0.0020	6/16/2021 13:15	M
Thallium	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:15	M
Zinc	0.050	U	mg/L	1	0.20	0.050	6/16/2021 13:15	M

Analysis Desc: SW846 6020B
Analysis, Total

Preparation Method: SW-846 3010A

Analytical Method: SW-846 6020

Arsenic	0.90	I	ug/L	2	2.0	0.50	6/16/2021 14:33	J
Selenium	2.5	U	ug/L	2	10	2.5	6/16/2021 14:33	J
Silver	1.0	U	ug/L	2	4.0	1.0	6/8/2021 20:21	J
Barium	19		ug/L	2	4.0	1.0	6/8/2021 20:21	J
Thorium	0.64	I	ug/L	2	2.0	0.50	6/16/2021 14:33	J^
Uranium	0.42	I	ug/L	2	1.6	0.40	6/8/2021 20:21	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water

Analytical Method: EPA 300.0

Bromide	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:03	J
Chloride	2.2	I	mg/L	1	8.0	2.0	6/1/2021 20:03	J
Fluoride	0.20	U	mg/L	1	0.80	0.20	6/3/2021 15:56	J
Nitrate (as N)	0.64	I	mg/L	1	0.80	0.20	6/1/2021 20:03	J
Nitrite (as N)	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:03	J
Sulfate	5.4	I	mg/L	1	8.0	2.0	6/1/2021 20:03	J

Analysis Desc: Ammonia,E350.1,Water

Analytical Method: EPA 350.1

Ammonia (N)	0.13		mg/L	1	0.030	0.015	6/1/2021 15:03	T
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Analysis Desc: TKN,E351.2,Water

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 351.2

Total Kjeldahl Nitrogen	0.646	J4	mg/L	1	0.20	0.087	6/7/2021 08:20	T
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Analysis Desc: Total
Phosphorus,E365.4,Analysis

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 365.4

Total Phosphorus (as P)	0.20	I,J4	mg/L	1	0.20	0.15	6/7/2021 08:20	T
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Analysis Desc:
Alkalinity,SM2320B,Water

Analytical Method: SM 2320B

Alkalinity, Bicarbonate	38		mg/L	1	20	5.0	5/26/2021 12:38	T
Alkalinity, Carbonate	5.0	U	mg/L	1	20	5.0	5/26/2021 12:38	T
Alkalinity, Total	38		mg/L	1	20	5.0	5/26/2021 12:38	T

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879002**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Black Humate**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Tot Dissolved Solids,SM2540C		Analytical Method: SM 2540 C						
Total Dissolved Solids	77		mg/L	1	10	10	5/26/2021 15:45	J
Analysis Desc: Cyanide, SM4500-E, Water		Analytical Method: SM 4500-CN-E						
Cyanide	0.0040	U	mg/L	1	0.010	0.0040	6/1/2021 16:05	T
Analysis Desc: TOC,SM5310B,Water		Analytical Method: SM 5310B						
Total Organic Carbon	14		mg/L	1	2.0	1.0	5/27/2021 12:59	G

Lab ID: **J2106879004**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Post Process Sand**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements		Analytical Method: Field Measurements						
Conductivity	56		umhos/cm	1			6/8/2021 14:12	J^
Dissolved Oxygen	7.78		mg/L	1			6/8/2021 14:12	J^
Temperature	22.6		°C	1			6/8/2021 14:12	J^
pH	7.17		SU	1			6/8/2021 14:12	J^
METALS								
Analysis Desc: E1631 Analysis,Water		Preparation Method: EPA 1631 E						
		Analytical Method: EPA 1631 E						
Mercury	11		ng/L	5	10	2.5	6/4/2021 15:47	J
Analysis Desc: SW846 6010B Analysis,Water		Preparation Method: SW-846 3010A						
		Analytical Method: SW-846 6010						
Calcium	3.2		mg/L	1	0.80	0.20	6/16/2021 13:04	M
Magnesium	1.3		mg/L	1	0.40	0.10	6/16/2021 13:04	M
Total Hardness (as CaCO3)	14		mg/L	1			6/16/2021 13:04	M

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879004**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Post Process Sand**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: SW846 6010B		Preparation Method: SW-846 3005A						
Analysis,Dissolved		Analytical Method: SW-846 6010,Dissolved						
Aluminum	0.66	I	mg/L	1	0.80	0.20	6/16/2021 13:26	M
Antimony	0.0070	U	mg/L	1	0.28	0.0070	6/16/2021 13:26	M
Beryllium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:26	M
Boron	0.10	U	mg/L	1	0.40	0.10	6/16/2021 13:26	M
Cadmium	0.0010	U	mg/L	1	0.0040	0.0010	6/16/2021 13:26	M
Calcium	3.2		mg/L	1	0.80	0.20	6/16/2021 13:26	M
Chromium	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:26	M
Cobalt	0.0010	U	mg/L	1	0.040	0.0010	6/16/2021 13:26	M
Copper	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:26	M
Iron	0.23	I	mg/L	1	0.80	0.20	6/16/2021 13:26	M
Lead	0.0030	U	mg/L	1	0.012	0.0030	6/16/2021 13:26	M
Magnesium	1.3		mg/L	1	0.40	0.10	6/16/2021 13:26	M
Manganese	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:26	M
Molybdenum	0.0040	U	mg/L	1	0.016	0.0040	6/16/2021 13:26	M
Nickel	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:26	M
Potassium	0.50	U	mg/L	1	2.0	0.50	6/16/2021 13:26	M
Silicon	0.58	I	mg/L	1	0.80	0.20	6/16/2021 13:26	M^
Sodium	3.6		mg/L	1	3.2	0.80	6/16/2021 13:26	M
Thallium	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:26	M
Tin	0.040	U	mg/L	1	0.16	0.040	6/16/2021 13:26	M
Titanium	0.010		mg/L	1	0.0080	0.0020	6/16/2021 13:26	M
Zinc	0.050	U	mg/L	1	0.20	0.050	6/16/2021 13:26	M

Analysis Desc: SW846 6020B
Analysis,Total

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Arsenic	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:37	J
Barium	7.4		ug/L	2	4.0	1.0	6/8/2021 20:26	J
Selenium	2.5	U	ug/L	2	10	2.5	6/16/2021 14:37	J
Silver	1.0	U	ug/L	2	4.0	1.0	6/8/2021 20:26	J
Thorium	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:37	J^
Uranium	0.40	U	ug/L	2	1.6	0.40	6/8/2021 20:26	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water

Analytical Method: EPA 300.0

Bromide	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:26	J
Chloride	2.0	U	mg/L	1	8.0	2.0	6/1/2021 20:26	J
Fluoride	0.20	U	mg/L	1	0.80	0.20	6/3/2021 16:19	J

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879004**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **SPLP Post Process Sand**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate (as N)	0.59	I	mg/L	1	0.80	0.20	6/1/2021 20:26	J
Nitrite (as N)	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:26	J
Sulfate	2.3	I	mg/L	1	8.0	2.0	6/1/2021 20:26	J
Analysis Desc: Ammonia,E350.1,Water		Analytical Method: EPA 350.1						
Ammonia (N)	0.32		mg/L	1	0.030	0.015	6/1/2021 15:04	T
Analysis Desc: TKN,E351.2,Water		Preparation Method: Copper Sulfate Digestion						
		Analytical Method: EPA 351.2						
Total Kjeldahl Nitrogen	0.659		mg/L	1	0.20	0.087	6/7/2021 08:20	T
Analysis Desc: Total Phosphorus,E365.4,Analysis		Preparation Method: Copper Sulfate Digestion						
		Analytical Method: EPA 365.4						
Total Phosphorus (as P)	0.15	U	mg/L	1	0.20	0.15	6/7/2021 08:20	T
Analysis Desc: Alkalinity,SM2320B,Water		Analytical Method: SM 2320B						
Alkalinity, Bicarbonate	17	I	mg/L	1	20	5.0	5/26/2021 12:43	T
Alkalinity, Carbonate	5.0	U	mg/L	1	20	5.0	5/26/2021 12:43	T
Alkalinity, Total	17	I	mg/L	1	20	5.0	5/26/2021 12:43	T
Analysis Desc: Tot Dissolved Solids,SM2540C		Analytical Method: SM 2540 C						
Total Dissolved Solids	23		mg/L	1	10	10	5/26/2021 15:45	J
Analysis Desc: Cyanide, SM4500-E, Water		Analytical Method: SM 4500-CN-E						
Cyanide	0.0040	U	mg/L	1	0.010	0.0040	6/1/2021 16:07	T
Analysis Desc: TOC,SM5310B,Water		Analytical Method: SM 5310B						
Total Organic Carbon	5.6		mg/L	1	2.0	1.0	5/27/2021 13:11	G

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879006**
Sample ID: **SPLP Composite**

Date Received: 05/21/21 12:00 Matrix: Water
Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements			Analytical Method: Field Measurements					
Conductivity	69		umhos/cm	1			6/8/2021 14:15	J^
Dissolved Oxygen	8.25		mg/L	1			6/8/2021 14:15	J^
Temperature	22.9		°C	1			6/8/2021 14:15	J^
pH	7.03		SU	1			6/8/2021 14:15	J^
METALS								
Analysis Desc: E1631 Analysis,Water			Preparation Method: EPA 1631 E					
			Analytical Method: EPA 1631 E					
Mercury	24		ng/L	5	10	2.5	6/4/2021 15:55	J
Analysis Desc: SW846 6010B Analysis,Water			Preparation Method: SW-846 3010A					
			Analytical Method: SW-846 6010					
Calcium	2.1		mg/L	1	0.80	0.20	6/16/2021 13:08	M
Magnesium	0.53		mg/L	1	0.40	0.10	6/16/2021 13:08	M
Total Hardness (as CaCO3)	7.4		mg/L	1			6/16/2021 13:08	M
Analysis Desc: SW846 6010B Analysis,Dissolved			Preparation Method: SW-846 3005A					
			Analytical Method: SW-846 6010,Dissolved					
Aluminum	0.91		mg/L	1	0.80	0.20	6/16/2021 13:30	M
Boron	0.10	U	mg/L	1	0.40	0.10	6/16/2021 13:30	M
Beryllium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:30	M
Calcium	1.7		mg/L	1	0.80	0.20	6/16/2021 13:30	M
Cadmium	0.0010	U	mg/L	1	0.0040	0.0010	6/16/2021 13:30	M
Cobalt	0.0010	U	mg/L	1	0.040	0.0010	6/16/2021 13:30	M
Chromium	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:30	M
Copper	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:30	M
Iron	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:30	M
Potassium	0.50	U	mg/L	1	2.0	0.50	6/16/2021 13:30	M
Magnesium	0.43		mg/L	1	0.40	0.10	6/16/2021 13:30	M
Manganese	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:30	M
Molybdenum	0.0040	U	mg/L	1	0.016	0.0040	6/16/2021 13:30	M
Sodium	8.9		mg/L	1	3.2	0.80	6/16/2021 13:30	M
Nickel	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:30	M
Lead	0.0030	U	mg/L	1	0.012	0.0030	6/16/2021 13:30	M
Antimony	0.0070	U	mg/L	1	0.28	0.0070	6/16/2021 13:30	M
Silicon	0.57	I	mg/L	1	0.80	0.20	6/16/2021 13:30	M^

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879006**
Sample ID: **SPLP Composite**

Date Received: 05/21/21 12:00 Matrix: Water
Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Tin	0.040	U	mg/L	1	0.16	0.040	6/16/2021 13:30	M
Titanium	0.022		mg/L	1	0.0080	0.0020	6/16/2021 13:30	M
Thallium	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:30	M
Zinc	0.050	U	mg/L	1	0.20	0.050	6/16/2021 13:30	M

Analysis Desc: SW846 6020B
Analysis, Total

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Arsenic	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:42	J
Selenium	2.5	U	ug/L	2	10	2.5	6/16/2021 14:42	J
Silver	1.0	U	ug/L	2	4.0	1.0	6/8/2021 20:31	J
Barium	24		ug/L	2	4.0	1.0	6/8/2021 20:31	J
Thorium	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:42	J^
Uranium	0.40	U	ug/L	2	1.6	0.40	6/8/2021 20:31	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water

Analytical Method: EPA 300.0

Bromide	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:49	J
Chloride	2.0	U	mg/L	1	8.0	2.0	6/1/2021 20:49	J
Fluoride	0.20	U	mg/L	1	0.80	0.20	6/3/2021 16:42	J
Nitrate (as N)	0.62	I	mg/L	1	0.80	0.20	6/1/2021 20:49	J
Nitrite (as N)	0.20	U	mg/L	1	0.80	0.20	6/1/2021 20:49	J
Sulfate	5.6	I	mg/L	1	8.0	2.0	6/1/2021 20:49	J

Analysis Desc: Ammonia,E350.1,Water

Analytical Method: EPA 350.1

Ammonia (N)	0.18		mg/L	1	0.030	0.015	6/1/2021 15:12	T
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Analysis Desc: TKN,E351.2,Water

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 351.2

Total Kjeldahl Nitrogen	0.610		mg/L	1	0.20	0.087	6/7/2021 08:20	T
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Analysis Desc: Total
Phosphorus,E365.4,Analysis

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 365.4

Total Phosphorus (as P)	0.15	U	mg/L	1	0.20	0.15	6/7/2021 08:20	T
-------------------------	------	---	------	---	------	------	----------------	---

Analysis Desc:
Alkalinity,SM2320B,Water

Analytical Method: SM 2320B

Alkalinity, Bicarbonate	18	I	mg/L	1	20	5.0	5/26/2021 12:48	T
Alkalinity, Carbonate	5.0	U	mg/L	1	20	5.0	5/26/2021 12:48	T
Alkalinity, Total	18	I	mg/L	1	20	5.0	5/26/2021 12:48	T

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879006**
Sample ID: **SPLP Composite**

Date Received: 05/21/21 12:00 Matrix: Water
Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Tot Dissolved Solids,SM2540C		Analytical Method: SM 2540 C						
Total Dissolved Solids	54		mg/L	1	10	10	5/26/2021 15:45	J
Analysis Desc: Cyanide, SM4500-E, Water		Analytical Method: SM 4500-CN-E						
Cyanide	0.0040	U,J4	mg/L	1	0.010	0.0040	6/1/2021 16:08	T
Analysis Desc: TOC,SM5310B,Water		Analytical Method: SM 5310B						
Total Organic Carbon	10		mg/L	1	2.0	1.0	5/27/2021 13:23	G

Lab ID: **J2106879007**
Sample ID: **Rain Water**

Date Received: 05/21/21 12:00 Matrix: Water
Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
FIELD PARAMETERS								
Analysis Desc: Data entry of field measurements		Analytical Method: Field Measurements						
Conductivity	151		umhos/cm	1			6/8/2021 14:16	J^
Dissolved Oxygen	8.92		mg/L	1			6/8/2021 14:16	J^
Temperature	23.2		°C	1			6/8/2021 14:16	J^
pH	5.63		SU	1			6/8/2021 14:16	J^
METALS								
Analysis Desc: E1631 Analysis,Water		Preparation Method: EPA 1631 E						
		Analytical Method: EPA 1631 E						
Mercury	4.2	I	ng/L	5	10	2.5	6/4/2021 16:03	J
Analysis Desc: SW846 6010B Analysis,Water		Preparation Method: SW-846 3010A						
		Analytical Method: SW-846 6010						
Aluminum	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:12	M
Boron	0.10	U	mg/L	1	0.40	0.10	6/16/2021 13:12	M
Beryllium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:12	M
Calcium	3.9		mg/L	1	0.80	0.20	6/16/2021 13:12	M
Cadmium	0.0010	U	mg/L	1	0.0040	0.0010	6/16/2021 13:12	M

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879007**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **Rain Water**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Cobalt	0.0010	U	mg/L	1	0.040	0.0010	6/16/2021 13:12	M
Chromium	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:12	M
Copper	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:12	M
Iron	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:12	M
Potassium	0.50	U	mg/L	1	2.0	0.50	6/16/2021 13:12	M
Magnesium	0.66		mg/L	1	0.40	0.10	6/16/2021 13:12	M
Manganese	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:12	M
Molybdenum	0.0040	U	mg/L	1	0.016	0.0040	6/16/2021 13:12	M
Sodium	0.96	I	mg/L	1	3.2	0.80	6/16/2021 13:12	M
Nickel	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:12	M
Lead	0.0030	U	mg/L	1	0.012	0.0030	6/16/2021 13:12	M
Antimony	0.0070	U	mg/L	1	0.28	0.0070	6/16/2021 13:12	M
Silicon	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:12	M^
Tin	0.040	U	mg/L	1	0.16	0.040	6/16/2021 13:12	M
Titanium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:12	M
Thallium	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:12	M
Zinc	0.050	U	mg/L	1	0.20	0.050	6/16/2021 13:12	M
Total Hardness (as CaCO3)	12		mg/L	1			6/16/2021 13:12	M

Analysis Desc: SW846 6010B
Analysis,Dissolved

Preparation Method: SW-846 3005A

Analytical Method: SW-846 6010,Dissolved

Aluminum	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:33	M
Boron	0.10	U	mg/L	1	0.40	0.10	6/16/2021 13:33	M
Beryllium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:33	M
Calcium	3.7		mg/L	1	0.80	0.20	6/16/2021 13:33	M
Cadmium	0.0010	U	mg/L	1	0.0040	0.0010	6/16/2021 13:33	M
Cobalt	0.0010	U	mg/L	1	0.040	0.0010	6/16/2021 13:33	M
Chromium	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:33	M
Copper	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:33	M
Iron	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:33	M
Potassium	0.50	U	mg/L	1	2.0	0.50	6/16/2021 13:33	M
Magnesium	0.62		mg/L	1	0.40	0.10	6/16/2021 13:33	M
Manganese	0.0050	U	mg/L	1	0.020	0.0050	6/16/2021 13:33	M
Molybdenum	0.0040	U	mg/L	1	0.016	0.0040	6/16/2021 13:33	M
Sodium	0.88	I	mg/L	1	3.2	0.80	6/16/2021 13:33	M
Nickel	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:33	M
Lead	0.0030	U	mg/L	1	0.012	0.0030	6/16/2021 13:33	M
Antimony	0.0070	U	mg/L	1	0.28	0.0070	6/16/2021 13:33	M
Silicon	0.20	U	mg/L	1	0.80	0.20	6/16/2021 13:33	M^
Tin	0.040	U	mg/L	1	0.16	0.040	6/16/2021 13:33	M

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879007**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **Rain Water**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Titanium	0.0020	U	mg/L	1	0.0080	0.0020	6/16/2021 13:33	M
Thallium	0.010	U	mg/L	1	0.040	0.010	6/16/2021 13:33	M
Zinc	0.050	U	mg/L	1	0.20	0.050	6/16/2021 13:33	M

Analysis Desc: SW846 6020B
Analysis, Total

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Arsenic	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:47	J
Selenium	2.5	U	ug/L	2	10	2.5	6/16/2021 14:47	J
Silver	1.0	U	ug/L	2	4.0	1.0	6/8/2021 20:36	J
Barium	3.0	I	ug/L	2	4.0	1.0	6/8/2021 20:36	J
Thorium	0.50	U	ug/L	2	2.0	0.50	6/16/2021 14:47	J^
Uranium	0.40	U	ug/L	2	1.6	0.40	6/8/2021 20:36	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water

Analytical Method: EPA 300.0

Bromide	0.20	U	mg/L	1	0.80	0.20	6/1/2021 21:12	J
Chloride	2.0	U	mg/L	1	8.0	2.0	6/1/2021 21:12	J
Fluoride	0.20	U	mg/L	1	0.80	0.20	6/3/2021 17:05	J
Nitrate (as N)	0.61	I	mg/L	1	0.80	0.20	6/1/2021 21:12	J
Nitrite (as N)	0.20	U	mg/L	1	0.80	0.20	6/1/2021 21:12	J
Sulfate	2.0	U	mg/L	1	8.0	2.0	6/1/2021 21:12	J

Analysis Desc: Ammonia,E350.1,Water

Analytical Method: EPA 350.1

Ammonia (N)	0.41		mg/L	1	0.030	0.015	6/1/2021 15:12	T
-------------	-------------	--	-------------	----------	-------	-------	----------------	---

Analysis Desc: TKN,E351.2,Water

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 351.2

Total Kjeldahl Nitrogen	0.572		mg/L	1	0.20	0.087	6/7/2021 08:20	T
-------------------------	--------------	--	-------------	----------	------	-------	----------------	---

Analysis Desc: Total
Phosphorus,E365.4,Analysis

Preparation Method: Copper Sulfate Digestion

Analytical Method: EPA 365.4

Total Phosphorus (as P)	0.15	U	mg/L	1	0.20	0.15	6/7/2021 08:20	T
-------------------------	-------------	----------	-------------	----------	------	------	----------------	---

Analysis Desc:
Alkalinity,SM2320B,Water

Analytical Method: SM 2320B

Alkalinity, Bicarbonate	12	I	mg/L	1	20	5.0	5/26/2021 12:53	T
Alkalinity, Carbonate	5.0	U	mg/L	1	20	5.0	5/26/2021 12:53	T
Alkalinity, Total	12	I	mg/L	1	20	5.0	5/26/2021 12:53	T

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ANALYTICAL RESULTS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID: **J2106879007**

Date Received: 05/21/21 12:00 Matrix: Water

Sample ID: **Rain Water**

Date Collected: 05/21/21 00:00

Sample Description:

Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Tot Dissolved Solids,SM2540C		Analytical Method: SM 2540 C						
Total Dissolved Solids	10	U	mg/L	1	10	10	5/26/2021 15:45	J
Analysis Desc: Cyanide, SM4500-E, Water		Analytical Method: SM 4500-CN-E						
Cyanide	0.0040	U	mg/L	1	0.010	0.0040	6/3/2021 11:21	T
Analysis Desc: TOC,SM5310B,Water		Analytical Method: SM 5310B						
Total Organic Carbon	1.4	I	mg/L	1	2.0	1.0	5/27/2021 13:34	G

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ANALYTICAL RESULTS QUALIFIERS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

PARAMETER QUALIFIERS

- U The compound was analyzed for but not detected.
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J4 Estimated Result

LAB QUALIFIERS

- G DOH Certification #E82001(AEL-G)(FL NELAC Certification)
- J DOH Certification #E82574(AEL-JAX)(FL NELAC Certification)
- J^ Not Certified
- M DOH Certification #E82535(AEL-M)(FL NELAC Certification)
- M^ Not Certified
- T DOH Certification #E84589(AEL-T)(FL NELAC Certification)

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QUALITY CONTROL DATA

Workorder: J2106879 Twin Pines Minerals SPLP 2021

QC Batch: WCAI/4444 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3899685

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Alkalinity, Total	mg/L	5.0	5.0 U

QC Batch: WCAJ/2468 Analysis Method: SM 2540 C
QC Batch Method: SM 2540 C Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3900213

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Total Dissolved Solids	mg/L	10	10 U

QC Batch: WCAg/2675 Analysis Method: SM 5310B
QC Batch Method: SM 5310B Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3904467

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Total Organic Carbon	mg/L	1.0	1.0 U

METHOD BLANK: 3904473

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Total Organic Carbon	mg/L	1.0	1.0 U

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QUALITY CONTROL DATA

Workorder: J2106879 Twin Pines Minerals SPLP 2021

QC Batch: WCAI/4536 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3905409

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Ammonia (N)	mg/L	0.015	0.015 U

QC Batch: WCAj/2513 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3905598

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Fluoride	mg/L	0.20	0.20 U
Chloride	mg/L	2.0	2.0 U
Nitrite (as N)	mg/L	0.20	0.20 U
Bromide	mg/L	0.20	0.20 U
Nitrate (as N)	mg/L	0.20	0.20 U
Sulfate	mg/L	2.0	2.0 U

QC Batch: WCAI/4574 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006

METHOD BLANK: 3906749

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY			
Cyanide	mg/L	0.0040	0.0040 U

QC Batch: WCAj/2546 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Prepared:
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

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QUALITY CONTROL DATA

Workorder: J2106879 Twin Pines Minerals SPLP 2021

METHOD BLANK: 3910432

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Fluoride	mg/L	0.20	0.20 U

QC Batch: WCAI/4640 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Prepared:
Associated Lab Samples: J2106879007

METHOD BLANK: 3910498

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Cyanide	mg/L	0.0040	0.0040 U

QC Batch: DGMj/1644 Analysis Method: EPA 1631 E
QC Batch Method: EPA 1631 E Prepared: 06/04/2021 09:15
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3911530

Parameter	Units	Blank Result	Reporting Limit Qualifiers
METALS Mercury	ng/L	0.50	0.50 U

QC Batch: DGMj/1650 Analysis Method: SW-846 6020
QC Batch Method: SW-846 3010A Prepared: 06/08/2021 04:48
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3912764

Parameter	Units	Blank Result	Reporting Limit Qualifiers
METALS Arsenic	ug/L	0.25	0.25 U
Selenium	ug/L	1.2	1.2 U
Silver	ug/L	0.50	0.50 U
Barium	ug/L	0.50	0.50 U
Uranium	ug/L	0.20	0.20 U

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QUALITY CONTROL DATA

Workorder: J2106879 Twin Pines Minerals SPLP 2021

METHOD BLANK: 3912764

QC Batch: WCAI/4748 Analysis Method: EPA 351.2
QC Batch Method: Copper Sulfate Digestion Prepared: 06/06/2021 08:00
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3915046

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Total Kjeldahl Nitrogen	mg/L	0.087	0.087 U

METHOD BLANK: 3915047

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Total Phosphorus (as P)	mg/L	0.15	0.15 U

QC Batch: WCAI/4748 Analysis Method: EPA 365.4
QC Batch Method: Copper Sulfate Digestion Prepared: 06/06/2021 08:00
Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3915046

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Total Kjeldahl Nitrogen	mg/L	0.087	0.087 U

METHOD BLANK: 3915047

Parameter	Units	Blank Result	Reporting Limit Qualifiers
WET CHEMISTRY Total Phosphorus (as P)	mg/L	0.15	0.15 U

QC Batch: DGMm/1459 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 06/15/2021 03:00

Report ID: 1058795 - 959568

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QUALITY CONTROL DATA

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Associated Lab Samples: J2106879002, J2106879004, J2106879006, J2106879007

METHOD BLANK: 3922493

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Aluminum	mg/L	0.20	0.20	U
Boron	mg/L	0.10	0.10	U
Beryllium	mg/L	0.0020	0.0020	U
Calcium	mg/L	0.20	0.20	U
Cadmium	mg/L	0.0010	0.0010	U
Cobalt	mg/L	0.0010	0.0010	U
Chromium	mg/L	0.0050	0.0050	U
Copper	mg/L	0.010	0.010	U
Iron	mg/L	0.20	0.20	U
Potassium	mg/L	0.50	0.50	U
Magnesium	mg/L	0.10	0.10	U
Manganese	mg/L	0.0050	0.0050	U
Molybdenum	mg/L	0.0040	0.0040	U
Sodium	mg/L	0.80	0.80	U
Nickel	mg/L	0.010	0.010	U
Lead	mg/L	0.0030	0.0030	U
Antimony	mg/L	0.0070	0.0070	U
Silicon	mg/L	0.20	0.20	U
Tin	mg/L	0.040	0.040	U
Titanium	mg/L	0.0020	0.0020	U
Thallium	mg/L	0.010	0.010	U
Zinc	mg/L	0.050	0.050	U

QUALITY CONTROL DATA QUALIFIERS

Workorder: J2106879 Twin Pines Minerals SPLP 2021

QUALITY CONTROL PARAMETER QUALIFIERS

- U The compound was analyzed for but not detected.
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J4 Estimated Result

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
J2106879002	SPLP Black Humate			SM 2320B	WCA _t /4444
J2106879004	SPLP Post Process Sand			SM 2320B	WCA _t /4444
J2106879006	SPLP Composite			SM 2320B	WCA _t /4444
J2106879007	Rain Water			SM 2320B	WCA _t /4444
J2106879002	SPLP Black Humate			SM 2540 C	WCA _j /2468
J2106879004	SPLP Post Process Sand			SM 2540 C	WCA _j /2468
J2106879006	SPLP Composite			SM 2540 C	WCA _j /2468
J2106879007	Rain Water			SM 2540 C	WCA _j /2468
J2106879002	SPLP Black Humate			SM 5310B	WCA _g /2675
J2106879004	SPLP Post Process Sand			SM 5310B	WCA _g /2675
J2106879006	SPLP Composite			SM 5310B	WCA _g /2675
J2106879007	Rain Water			SM 5310B	WCA _g /2675
J2106879002	SPLP Black Humate			EPA 350.1	WCA _t /4536
J2106879004	SPLP Post Process Sand			EPA 350.1	WCA _t /4536
J2106879006	SPLP Composite			EPA 350.1	WCA _t /4536
J2106879007	Rain Water			EPA 350.1	WCA _t /4536
J2106879002	SPLP Black Humate			EPA 300.0	WCA _j /2513
J2106879004	SPLP Post Process Sand			EPA 300.0	WCA _j /2513
J2106879006	SPLP Composite			EPA 300.0	WCA _j /2513
J2106879007	Rain Water			EPA 300.0	WCA _j /2513
J2106879002	SPLP Black Humate			SM 4500-CN-E	WCA _t /4574
J2106879004	SPLP Post Process Sand			SM 4500-CN-E	WCA _t /4574
J2106879006	SPLP Composite			SM 4500-CN-E	WCA _t /4574
J2106879002	SPLP Black Humate			EPA 300.0	WCA _j /2546
J2106879004	SPLP Post Process Sand			EPA 300.0	WCA _j /2546
J2106879006	SPLP Composite			EPA 300.0	WCA _j /2546
J2106879007	Rain Water			EPA 300.0	WCA _j /2546

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
J2106879007	Rain Water			SM 4500-CN-E	WCAI/4640
J2106879002	SPLP Black Humate	EPA 1631 E	DGMj/1644	EPA 1631 E	CVAj/1144
J2106879004	SPLP Post Process Sand	EPA 1631 E	DGMj/1644	EPA 1631 E	CVAj/1144
J2106879006	SPLP Composite	EPA 1631 E	DGMj/1644	EPA 1631 E	CVAj/1144
J2106879007	Rain Water	EPA 1631 E	DGMj/1644	EPA 1631 E	CVAj/1144
J2106879002	SPLP Black Humate	SW-846 3010A	DGMj/1650	SW-846 6020	ICMj/1250
J2106879004	SPLP Post Process Sand	SW-846 3010A	DGMj/1650	SW-846 6020	ICMj/1250
J2106879006	SPLP Composite	SW-846 3010A	DGMj/1650	SW-846 6020	ICMj/1250
J2106879007	Rain Water	SW-846 3010A	DGMj/1650	SW-846 6020	ICMj/1250
J2106879002	SPLP Black Humate	Copper Sulfate Digestion	WCAI/4748	EPA 351.2	WCAI/4777
J2106879004	SPLP Post Process Sand	Copper Sulfate Digestion	WCAI/4748	EPA 351.2	WCAI/4777
J2106879006	SPLP Composite	Copper Sulfate Digestion	WCAI/4748	EPA 351.2	WCAI/4777
J2106879007	Rain Water	Copper Sulfate Digestion	WCAI/4748	EPA 351.2	WCAI/4777
J2106879002	SPLP Black Humate	Copper Sulfate Digestion	WCAI/4748	EPA 365.4	WCAI/4778
J2106879004	SPLP Post Process Sand	Copper Sulfate Digestion	WCAI/4748	EPA 365.4	WCAI/4778
J2106879006	SPLP Composite	Copper Sulfate Digestion	WCAI/4748	EPA 365.4	WCAI/4778
J2106879007	Rain Water	Copper Sulfate Digestion	WCAI/4748	EPA 365.4	WCAI/4778
J2106879002	SPLP Black Humate	SW-846 3005A	DGMm/1459	SW-846 6010,Dissolved	ICPm/1453
J2106879002	SPLP Black Humate	SW-846 3010A	DGMm/1459	SW-846 6010	ICPm/1453
J2106879004	SPLP Post Process Sand	SW-846 3005A	DGMm/1459	SW-846 6010,Dissolved	ICPm/1453
J2106879004	SPLP Post Process Sand	SW-846 3010A	DGMm/1459	SW-846 6010	ICPm/1453
J2106879006	SPLP Composite	SW-846 3005A	DGMm/1459	SW-846 6010,Dissolved	ICPm/1453
J2106879006	SPLP Composite	SW-846 3010A	DGMm/1459	SW-846 6010	ICPm/1453
J2106879007	Rain Water	SW-846 3005A	DGMm/1459	SW-846 6010,Dissolved	ICPm/1453
J2106879007	Rain Water	SW-846 3010A	DGMm/1459	SW-846 6010	ICPm/1453
J2106879002	SPLP Black Humate	Field Measurements	FLDj/	Field Measurements	FLDj/
J2106879004	SPLP Post Process Sand	Field Measurements	FLDj/	Field Measurements	FLDj/

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: J2106879 Twin Pines Minerals SPLP 2021

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
J2106879006	SPLP Composite	Field Measurements	FLDj/	Field Measurements	FLDj/
J2106879007	Rain Water	Field Measurements	FLDj/	Field Measurements	FLDj/

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☐ Miramar: 10200 USA Today Way, Miramar, FL 33025 • 954.889.2200 • Fax 954.889.2201
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☐ Tampa: 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327



Client Name: <u>Jacobs Eng / Twin Pines Mine</u>		Project Name: <u>Twin Pines Mine SPLP 2021</u>		BOTTLE SIZE & TYPE	ANALYSIS REQUIRED	Analysis per Twin Pines Mine SPLP 2021 Proposal from Todd Romero	LABORATORY I.D. NUMBER
Address: <u>10 10th Street NW</u>		P.O. Number/Project Number:					
Suite <u>1400</u>		Project Location:					
Phone: <u>678-550-4415</u>		FDEP Facility No:					
FAX:		Project Name and Address:					
Contact: <u>BT Thomas</u>		Profile <u>67169</u>					
Sampled By: <u>TRM / TRL</u>		Special Instructions:					
Turn Around Time: ☐ STANDARD ☐ RUSH		☐ ADAPT ☐ EQUIS ☐ Other					
Page <u> </u> of <u> </u>							

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING		MATRIX	NO. COUNT	Preservation	Field-Filtered?										
			DATE	TIME														
SA-HES-18-100	10-20'				SO	1												001
SA-HES-19-470	15-20'				SO	1												002
SA-HES-18-338	15-20'				SO	1												003
SA-HES-19-486	15-20'				SO	1												004
SA-HES-18-343	25-30'				SO	1												005
SA-HES-18-336	15-20'				SO	1												006
PT 414 POLYMER FOR SOLIDS SETTLING																		

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge Preservation Code: I = ice H = (HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☐ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked Temperature when received _____ (in degrees Celsius)

DCN: AD-051 Form last revised 10/15/2015

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V

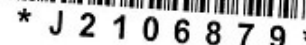
	Relinquished by:	Date	Time	Received by:	Date	Time
1		5/14/21	9:43		5/14/21	9:43
2						
3						
4						

FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____
Contact Person: _____ Phone: _____
Supplier of Water: _____
Site Address: _____



- ☐ **Altamonte Springs:** 380 Northlake Blvd., Ste. 1048 • Altamonte Springs, FL 32714 • 407.351.1111 • Fax 407.351.1112
- ☐ **Gainesville:** 4965 SW 41st Blvd. • Gainesville, FL 32608 • 352.371.1111 • Fax 352.371.1112
- ☐ **Jacksonville:** 6681 Southpoint Pkwy. • Jacksonville, FL 32216 • 904.371.1111 • Fax 904.371.1112
- ☐ **Miramar:** 10200 USA Today Way, Miramar, FL 33025 • 954.889.2111 • Fax 954.889.2112
- ☐ **Tallahassee:** 1288 Cedar Center Drive, Tallahassee, FL 32301 • 904.630.4327 • Fax 904.630.4327
- ☐ **Tampa:** 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

[illegible]

Received on Ice ☒ Yes ☒ No ☒ Temp taken from sample ☐ Temp from blank

☐ Where required, pH checked ☒ Temperature when received 41.0 (in degrees celcius)

DCN: AD-051 Form last revised 10/15/2015

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V

	Relinquished by:	Date	Time	Received by:	Date	Time
1		5/14/21	9:43	jt batario	5/14/21	9:43
2						
3						
4						

FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone : _____

Supplier of Water: _____

Site-Address:



Work Order: J2106879
Client: Twin Pines Minerals, LLC
Project ID: Twin Pines Minerals SPLP 2021

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.
Analysis: All holding times were met.

III. Method

Analysis: SM 4500-CN-E
Preparation:

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

Calibration: All acceptance criteria were met.
Blanks: All acceptance criteria were met.
Surrogates: All acceptance criteria were met.
Spikes: The matrix spike recovery of Cyanide for J2106879006 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) is acceptable, which indicates the analytical batch was in control. No further corrective action was required.
Internal Standard: All acceptance criteria were met.
Samples: All acceptance criteria were met.
Other: All acceptance criteria were met.
Serial Dilution: All acceptance criteria were met.
Duplicates: All acceptance criteria were met.



Work Order: J2106879
Client: Twin Pines Minerals, LLC
Project ID: Twin Pines Minerals SPLP 2021

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.
Analysis: All holding times were met.

III. Method

Analysis: EPA 351.2
Preparation: Copper Sulfate Digestion

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

Calibration: All acceptance criteria were met.
Blanks: All acceptance criteria were met.
Surrogates: All acceptance criteria were met.
Spikes: The matrix spike recovery of TKN for J2106511001 and J2106879001 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and %RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in these matrixes. No further corrective action was required.
Internal Standard: All acceptance criteria were met.
Samples: All acceptance criteria were met.
Other: All acceptance criteria were met.
Serial Dilution: All acceptance criteria were met.
Duplicates: All acceptance criteria were met.



Work Order: J2106879
Client: Twin Pines Minerals, LLC
Project ID: Twin Pines Minerals SPLP 2021

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.
Analysis: All holding times were met.

III. Method

Analysis: EPA 365.4
Preparation: Copper Sulfate Digestion

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

Calibration: All acceptance criteria were met.
Blanks: All acceptance criteria were met.
Surrogates: All acceptance criteria were met.
Spikes: The matrix spike recovery of TP for J2106511001 and J2106879001 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and %RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in these matrixes. No further corrective action was required.
Internal Standard: All acceptance criteria were met.
Samples: All acceptance criteria were met.
Other: All acceptance criteria were met.
Serial Dilution: All acceptance criteria were met.
Duplicates: All acceptance criteria were met.