CEDAR LAKE MINING, INC.
LITTLE SPRING CREEK EAST MINE, P-3968

ALABAMA SURFACE MINING COMMISSION
SURFACE COAL MINING PERMIT APPLICATION

ATTACHMENT IV-C-2
TOPSOIL VARIANCE APPLICATION

Prepared by;

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STATE OF ALABAMA
SURFACE MINING COMMISSION
P.O. BOX 2390 - JASPER, ALABAMA 35502-2390
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August 6, 2013

Jerry W. Williams, P.E.
TASK Engineering Management, Inc.
P.O. Box 660548
Birmingham, AL 35266

RE: Findings on Application for Topsoil Variance
Cedar lake Mining, Inc.
Little Spring Creek East Mine
ASMC P-3968

Dear Mr. Williams:

I have reviewed the application for a Topsoil Variance as well as the additional information submitted. Based on the conditions of the area presented, a Topsoil Variance is approved for this permit as presented at time of issuance. Any revisions adding additional acreage will be subject to review for an extension of the Topsoil Variance.

Prior to a Phase I Bond Release, sampling and testing of the spoil substitute material for textural analysis of the coarse and fine fractions, past pH, total sulfur an acid-base account and the results submitted to the ASMC. The following textural analysis standards apply to all areas of the variance:

1. The topsoil substitute material, constituting the top six inches of growth medium, shall contain no durable rock greater than 24 inches in any dimension.

2. The topsoil substitute material shall not contain more than 10% by weight of rocks 10 inches or greater in size.

3. The topsoil substitute material shall not contain more than 15% by weight of rocks between 3 inches and 10 inches in size.

4. The subsitute material shall not contain more than 50% by weight of materials between 3 inches and 0.75 inches in size.

5. The substitute material **shall contain** at least 30% by weight of soil sized (<2mm) material.

Sincerely,

Christa Marks

Christa Marks
Hydrogeologist

INTRODUCTION

As per Section 880-X-10C.08(5) of the Administrative Code of the Alabama Surface Mining Commission, selected overburden materials may be substituted for or used as a supplement to topsoil materials if it can be demonstrated to the State Regulatory Authority by the person and/or entity who conducts surface mining activities that the resulting soil medium is equal to or more suitable for sustaining revegetation than existing topsoil and the substitute material is the best available within the permit area to support revegetation. The following study will endeavor to prove that the previously stated criteria is met for Cedar Lake Mining, Inc. at the proposed Little Spring Creek - East Mine - ASMC Permit P-3968 and to request a Topsoil Variance on the entire permit area and on all soil types with the exception of 1.35 acres of prime soil (Wynnville Fine Sandy Loam 0-4% Slopes) located in the SE¼ of NE¼ of Section 35, Township12 South, Range 7 West, Walker County, Alabama and as listed by the Soil Survey of Walker County, Alabama, U.S. Department of Agriculture Soil Conservation Service. The total acreage of the Little Spring Creek - East mine area is approximately 589.0 acres. This proposed topsoil waiver will address 217.0 acres of Increment No. 1, 102.0 acres of Increment No. 2, 98.0 acres of Increment No. 3, 166.0 acres of Increment No. 4, and 6.0 acres of Increment No. 5

MINE SITE INFORMATION

Little Spring Creek - East Mine occupies 589.0 acres of which 583.0 acres are mining acres and 6.0 acres are set aside for the mine office, road, ponds and other incidentals. The mine site is located in Sections 34 and 35, Township 12 South, Range 7 West and in Sections 2 and 3, Township 13 South, Range 7 West, Walker County, Alabama as found on the Manchester and Sunlight U.S.G.S. Quadrangle maps. See the attached Soils Map showing the mine site location, soil types within the permit area, drill hole locations, topsoil and overburden collection sites. The coal seam to mined at this site is the Black Creek Coal Seam.

The proposed mine site is situated between Little Spring Creek to the west and Bird Farm Road to the east. Generally, the entire proposed mine site has been previously impacted by timber harvesting activities as recently as 2009. At this time there are several access roads, timber loading decks and clear cut sections, all suffering subsequent erosion, as well as, secondary growth and immature pines. Due to timber harvesting and erosion associated with its activities, the majority of the soils within the proposed mine area have been disturbed and several areas lack topsoil altogether. Four (4) first order drainage courses occur within the proposed mine area and sloped terrain is present throughout the proposed mine boundary.

SOILS PRESENT BEFORE MINING

Soils present within the permit area are as follows:

Bankhead-Rock Complex	BaE,	15 - 60% Slopes
Mooreville Silt Loam	MoA,	0 - 1% Slopes*
Nauvoo-Townley Complex	NaE,	4 - 20% Slopes
Nauvoo and Sipsey Soils	NSC,	6 - 12% Slopes
Pruitton Loam	PrA,	0 - 2% Slopes
Sipsey Loamy Sand	SeE,	4 - 18% Slopes
Sipsey-Bankhead Complex	ShE,	15 - 45% Slopes
Wynnville Fine Sandy Loam**	WyB,	0 - 4% Slopes

** Frequently Flooded*

*** Prime Farmland Soil*

LANDUSE

The pre-mining land use of the proposed permitted area consists of undeveloped/no current use with trees. The proposed post mining land use of the proposed permit areas will be undeveloped/no current use with grasses as the primary vegetative cover. All proposed sediment basins will be temporary water impoundments.

SOIL DESCRIPTIONS

The Soil Survey of Walker County, Alabama (Stevens 1992) and the USDA Natural Resources Conservation Service, Web Soil Survey 2.0 (USDA 2008) indicates that eight (8) soil types and complexes occur within the proposed permit area. The description of these soils and complexes is as follows:

Bankhead-Rock Outcrop Complex, 15 to 60 percent slopes, (BaE) - This complex occurs as areas of moderately deep, well drained, and moderately steep to very steep soil on narrow, winding ridge tops and highly dissected side slopes. It is also present at areas of rock outcrops and rock bluffs on the steep side slopes above the major drainage ways or at the head of large ravines. Typically, the soil has a surface layer of very dark grayish brown sandy loam about four (4") inches thick. The upper part of the subsoil is brownish yellow channery sandy loam. It extends to a depth of thirteen (13") inches. The lower part is yellowish brown cobbly sandy loam. It extends to a depth of twenty-six (26") inches. It is underlain by fractured, hard, level-bedded sandstone. Nearly all of the acreage is wooded with mixed hardwoods and pine. This complex is unsuited to cultivated crops and pasture because of the slopes and rock outcrop.

Mooreville Silt Loam, 0 to 1 percent slopes, frequently flooded, (MoA) - This deep, moderately well drained, nearly level soil occurs on flood plains. Slopes are smooth and slightly convex. Individual areas are mostly long and narrow and parallel to streams. These soils units range from ten (10) to sixty (60) acres in size. Typically, the surface layer is dark grayish brown silt loam about eight (8") inches in thickness. The upper part of the subsoil is mottled yellowish

brown loam about nine (9") inches in thickness. The lower part is loam mottled is shades of gray and brown. This soil unit generally extends to a depth of forty-five (45") inches. It is underlain to a depth of sixty (60") inches by mottled gray and yellowish brown clay loam. Most of the acreage in this map unit is woodland with scattered small acres used as pasture or cropland.

Nauvoo-Townley Complex, 4 to 20 percent slopes, (NaE) - These deep and moderately deep, well drained, gently sloping to moderately steep soils occur on narrow ridge tops and on side slopes. The Nauvoo soil is generally on the higher, less sloping ridge tops and upper side slopes, and the Townley soil is on the lower ridges and side slopes. Slopes are short and are complex and generally convex. Individual areas are irregular is shape, generally conforming to the shape of the ridge, and range from twenty (20) to sixty (60) acres in size. They are about fifty (50%) percent Nauvoo soil and forty-five (45%) percent Townley soil. Typically, the Nauvoo soil has a surface layer of dark yellowish brown fine sandy loam about four (4") inches thick. The upper part of the subsoil is red and yellowish red clay loam and sandy clay loam. It extends to a depth of thirty-three (33") inches. The lower part is mottled yellowish red and strong brown fine sandy loam. It extends to a depth of forty (40") inches. It is underlain by level-bedded, weathered sandstone. Typically, the Townley soil has a surface layer of dark grayish brown silt loam about five (5") inches thick. The subsoil is yellowish red silty clay and extends to a depth of thirty-one (31") inches. It is underlain by weathered siltstone or fine grained sandstone. Most areas are wooded with a few areas used for pasture or home site development.

Nauvoo and Sipsey Soils, 6 to 12 percent slopes, (NSC) - These deep and moderately deep, well drained, gently sloping and sloping soils are on ridge tops. Slopes are smooth and convex. Individual areas are irregular in shape and range from forty (40) to two hundred (200) acres in size. Typically, the Nauvoo soil has a surface layer of dark yellowish brown fine sandy loam about four (4") inches thick. The upper part of the subsoil is red clay loam. It extends to a depth of twenty-five (25") inches. The lower part is yellowish red sandy clay loam and mottled fine sandy loam. It extends to a depth of forty (40") inches. It is underlain by level-bedded, weathered sandstone. Typically the Sipsey soil has a surface layer of brown loamy sand about four (4") inches thick. The subsurface layer is yellowish brown sandy loam. It extends to a depth of sixteen (16") inches. The subsoil is strong brown sandy clay loam and extends to a

depth of thirty-one (31") inches. It is underlain by weathered sandstone. Most areas are used as woodland or pasture with a few areas used for home site development.

Pruitton Loam, 0 to 2 percent slopes, frequently flooded, (PrA) - This deep, well drained, level and nearly level soil is on flood plains along the larger streams in the country. Slopes are smooth and slightly concave. Individual areas are generally long and narrow and are parallel to streams. They range from ten (10) to one hundred (100) acres in size. Typically, the surface layer is yellowish brown loam about seven (7") inches thick. The subsoil is yellowish brown loam and extends to a depth of forty-one (41") inches. It is underlain to a depth of sixty-four (64") inches by mottled yellowish brown, very pale brown, dark yellowish brown and strong brown sandy loam. Most of the acreage is wooded with some areas cleared and used for cultivated crops for pasture and hay.

Sipsey Loamy Sand, 4 to 18 percent slopes, (SeE) - This moderately deep, well drained, gently sloping to moderately steep soils occurs on narrow ridge tops and upper side slopes. Slopes are complex and convex. Individual areas are irregular in shape and range from fifteen (15) to one hundred-twenty (120) acres in size. Typically, the surface layer is brown loamy sand about four (4") inches thick. The subsurface layer is yellowish brown sandy loam about twelve (12") inches thick. The subsoil is strong brown sandy clay loam and extends to a depth of thirty-one (31") inches. It is underlain by level-bedded, weathered sandstone. Most area are used as woodland or pasture with a few small areas used for cultivated crops or home site development.

Sipsey-Bankhead Complex, 15 to 45 percent slopes, (ShE) - These moderately deep, well drained, moderately steep to very steep soils are on side slopes. Slopes are short and are concave and convex. Individual areas are irregular in shape and range from fifty (50) to three hundred (300) acres in size. Typically, the Sipsey soil has a surface layer of brown loamy sand about four (4") inches thick. The subsurface layer is yellowish brown sandy loam about twelve (12") inches thick. The subsoil is strong brown sandy clay loam and extends to a depth of thirty-one (31") inches. It is underlain by level-bedded, weathered sandstone. Typically, the Bankhead soil has a surface layer of very dark grayish brown sandy loam about four (4") inches thick. The lower part is yellowish brown cobbly sandy loam that extends to a depth of twenty-six (26") inches and

is underlain by fractured, hard, level-bedded sandstone. Almost all of the acreage is wooded with a few areas used as pasture.

Wynnville Fine Sandy Loam, 0 to 4 percent slopes, (WyB) - This deep, moderately well drained, level to gently sloping soils occurs on old, high stream terraces. Slopes are smooth and slightly convex. Individual areas are irregular in shape and range from ten (10) to seventy-five (75) acres in size. Typically, the surface layer is brown fine sandy loam about ten (10") inches thick. The upper part of the subsoil is strong brown loam and extends to a depth of twenty-two (22") inches. The next part is a slightly brittle, compact fragipan of yellowish brown loam and strong brown sandy clay loam with tongues and pockets of light gray sandy loam and extends to a depth of fifty-six (56") inches. The lower part to a depth of sixty-four (64") inches is strong brown sandy clay loam that has yellowish red and light brownish gray mottles. Most areas are used for pasture, cultivated crops or woodland with a few areas used for home site development.

GEOLOGIC DESCRIPTION

The proposed mine area is underlain by the Pottsville Formation of Pennsylvanian age. As defined by historical geologic data, the strata of the Pottsville Formation are comprised of shales, siltstones, and sandstones with lesser amounts of coal, underclay and conglomerate. Structurally, the Warrior Basin is synclinal in nature with the synclinal axis extending from north-central Mississippi in the west to north-central Alabama in the east. The syncline is tilted to the southwest with a regional dip of 30 to 200 feet per mile. Four (4) major structures found within the Warrior Basin that modify the basic dip of the Warrior Basin are the Warrior, Coalburg and Arkadelphia Synclines and the Sequatchie Anticline. The fold axis of the synclinal trends is parallel to the Appalachian system in a northeast-southwest direction and plunge to the southwest with the regional dip. Faulting is generally found perpendicular to the fold axis of the synclinal trend and tend to be high-angle.

The strata which outcrops in the immediate vicinity of the Little Spring Creek mine includes weathered sandstones, sandstones, interbedded sandstones and shales, shales, and coal associated with the Black Creek Coal Group. According to historical data published in "Depositional Settings of the Pottsville Formation in the Black Warrior Basin", the Black Creek Group lies approximately 100 to 300 feet above the "J" Group and from 40 to 130 feet below the Mary Lee Coal Group with the Black Creek Group occurring within a stratigraphic interval from 45 to 160 feet thick.

Outcroppings within the extended site (Little Spring Creek East and Little Spring Creek West) are consistent with the upper Pottsville Formation of the Warrior Coal Field and are composed chiefly of alternating beds of gray sandstones, conglomerate, siltstone and shale with beds of coal and underclay. The maximum thickness of the formation in the western part of the area is about 4,500 feet, and in the eastern part it is about 9,000 feet (Culbertson 1964). Except for conglomeratic sandstone at the base of the formation, few lithologic horizons can be correlated regionally according to the "Hydrologic Assessment, Eastern Coal Province Area 23, Alabama".

The coal seam to be mined at this site is the Black Creek Seam. The Jefferson seam was present as a marker in several exploration drill holes but due to its thinness is not considered minable.

When the Jefferson seam was encountered, it only showed approximately two (2") inches to three (3") inches in thickness and was collected with the corresponding overburden interval sample and was not deemed of sufficient thickness to separate as an individual sample. No Lick Creek coal was encountered in any exploration drill holes and is not present at the site. For coal seam information, see the following table:

SEAM	THICKNESS	OVERBURDEN	STRKE/DIP
BLACK CREEK	1.44'	70.31'	N27°42'47"W/ S12°19'17"W

The lithology description for the mine site was developed utilizing a composite of the six (6) overburden sample drill holes drilled by Haley Brothers Coal, Inc. using a Chicago Pneumatic CP-650 utilizing a 6-3/4 inch drill bit and under the supervision of TASK Engineering Management Inc. and by 17 exploratory rotary drill holes drilled by and under the supervision of Haley Brothers Coal, Inc utilizing the same equipment. (See drawings entitled Overburden Columns for geologic columns of these six (6) overburden samples and Drillhole Columns - Sheet 1 of 2, Sheet 2 of 2 for geologic columns of the 17 exploratory drill holes.) For the locations of drillholes, overburden sample sites and ground-water monitoring wells, see the attached Hydro-Geo Map.

Incorporating these exploration drillhole data, overburden sample drillhole data and surface contour data, a digital model of the entire proposed mine site (Little Spring Creek East and Little Spring Creek West) has been developed using Carlson Mining 2011 with AutoCad 2011 computer software. The methodology of this software constructs a geologic model of the mine site by constructing a surface grid file on 20' X 20' spacing to determine the top limits of the said geologic model. Strata grid files are then developed to correspond to the same 20' X 20' grid spacing for the bottom elevation of each strata layer from the top limit elevation surface grid to the bottom elevation grid of the Black Creek Coal seam. (Note that all drillhole and/or overburden column drawings are shown in the drawings with the legend and descriptions of the corresponding strata grid files.) These surface and strata grid files are correlated from the top (ground surface) to the bottom (bottom of coal) and are defined by a Pre-Calculated Grid file which constitutes the geologic model for the site. All grid files other that the surface (top) grid are based on the drillhole data developed from exploration drilling at the site.

Once the geologic model has been constructed, geologic fence diagrams, cross-sections and volumetric calculations can be constructed as required on a practically instantaneous basis. (See OB-1/MW-1, OB-2/MW-2, OB-3/MW-3 ,OB-4/MW-4, OB-5 and OB-6 for detailed drawings showing the overburden sequences/lithology of the overburden sample holes as well as specific data on the wellhead appliances installed in each overburden sample/monitoring well hole.) Overburden lithology remains constant across the extent of the proposed mine site delineated as Little Spring Creek East as well as the proposed future mine site delineated as Little Spring Creek West. See enclosed drawings of these exploratory drill columns for geologic details of the overburden and exploratory drill holes shown by Drillhole Columns - Sheet 1 of 2, Sheet 2 of 2 and Overburden Columns. The following table lists the historical drillhole data and personnel in charge of drilling operations corresponding to the graphical exploration drill columns depicted below in Exhibit 2.1.

EXHIBIT 2.1		
Drill Hole ID	Drilling Supervisor	Drill Date
MW-1/OB-1	JERRY W. WILLIAMS	04/09/2009
MW-2/OB-2	JERRY W. WILLIAMS	04/09/2009
MW-3/OB-3	JERRY W. WILLIAMS	04/16/2009
MW-4/OB-4	JERRY W. WILLIAMS	04/16/2009
OB-5	JERRY W. WILLIAMS	07/27/2011
OB-6	JERRY W. WILLIAMS	07/27/2011
DH-238	ZACHARY HALEY	09/05/2008
DH-240	ZACHARY HALEY	09/06/2008
DH-244	ZACHARY HALEY	09/12/2008
DH-246	ZACHARY HALEY	09/17/2008
DH-247	ZACHARY HALEY	09/17/2008
DH-248	ZACHARY HALEY	09/18/2008
DH-249	ZACHARY HALEY	09/19/2008
DH-273	ZACHARY HALEY	01/29/2009
DH-283	ZACHARY HALEY	04/07/2009
DH-286	ZACHARY HALEY	04/30/2009
DH-287	ZACHARY HALEY	07/16/2009
DH-288	ZACHARY HALEY	07/17/2009
DH-290	ZACHARY HALEY	07/17/2009
DH-291	ZACHARY HALEY	07/17/2009
DH-293	ZACHARY HALEY	07/20/2009
DH-294	ZACHARY HALEY	07/20/2009
DH-295	ZACHARY HALEY	07/21/2009

Six (6) overburden drill holes have been drilled at the proposed mine site to document the chemical properties of the overburden materials and for acid-base accounting purposes. These drill holes were drilled with a Chicago Pneumatic CP-650 rotary air drill and the overburden cuttings generated by the process were collected in five (5) foot intervals, logged, labeled and prepared for laboratory analysis. The cuttings were sampled in minimum five (5) foot increments and at each change of the lithology of the overburden materials. In some instances due to drilling constraints and to maintain continuity the five (5) foot interval may not be maintained but these instances are rare and generally the required sample intervals have been maintained. The geologic properties of the overburden strata are noted in the geologic logs listed in Exhibit 2.2 and a graphical representation of the lithology at each overburden testing site is depicted by the drawing entitled Overburden Columns.

Samples collected in the field were then packed in chronological order, packed and shipped for analysis to Standard Laboratories, Inc. located in Whitesburg, Kentucky. Chemical analysis was performed on each lithologic unit by a laboratory test for the total sulfur of that unit. Using industry standard methodology the total sulfur is converted to potential acidity by multiplying total sulfur percent by 31.25. The results of these analyses determine potential acidity and are reported in tons of calcium carbonate equivalent per 1000 tons of material. Any overburden with a potential acidity less than zero (0) tons calcium carbonate equivalent per 1000 tons of overburden material is considered acid or toxic-forming. The final laboratory reports from Standard Laboratories, Inc reported Acid Base Accounts of each strata interval. This Acid Base Account reported Potential Acidity, Paste pH, Total Sulfur (Dry Basis), Neutralization Potential and Net Potential Surplus/Deficiency (+/-). Neutralization potential is the ability of strata units to neutralize acid material and is reported in tons of calcium carbonate equivalent per 1000 tons of material. Acid-Base account is the mathematical determination developed by calculating the neutralization potential minus potential acidity. This parameter is the results of these calculations reported as a deficiency (-) or excess (+) for each geologic column interval. Results of all chemical analysis for each strata sampled are listed by drill hole in Exhibit 2.3.

From the chemical data determined by Standard Laboratories, Inc. the composite results of all overburden intervals have been tabulated using the industry standard spreadsheet program

designed by the Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation.

According to the results of the overburden analysis spreadsheets each overburden hole and corresponding area of influence shows an excess of native alkaline materials to neutralize any acid forming strata. The overall average Acid-Base Accounts of the overburden sampled from the overburden holes show a small portion of the overburden that could be considered mildly acid forming. As sampled from OB-1, the strata from 0' to 5' and the coal seam indicate mildly acid forming material. As sampled from OB-2, the strata from 0' to 5', 35' to 39' and the coal seam indicate mildly acid forming material. As sampled from OB-3, the strata from 85' to 86.5' immediately above the coal seam and the coal seam indicate moderately acid forming material. As sampled from OB-4, the strata from 0' to 10' and the coal seam indicate mildly acid forming material. As sampled from OB-5, no strata is indicated acidic. As sampled from OB-6, the strata from 103' to 104.33' immediately above the coal seam indicate moderately acid forming material. The negative ABA in the strata surrounding the coal seams is due to contamination from the coal seam. The coal seam within each overburden hole contains a high amount of acid forming material but only a small portion of the coal seam material will be spoiled in the coal removal operations. This material will be specifically handled according to the Alabama Surface Mining Commission (ASMC) approved mining plan. See Exhibit 2.4 for spreadsheet outputs for each overburden hole.

The weighted averages indicate that there is sufficient alkaline material contained in the overburden materials at this proposed mine to neutralize the intervals of acid forming materials within the overburden column.

Acid forming material should not pose a problem at this mine site according to the overall Acid Base Account of the drill holes.

The following chart shows the thickness-weighted averages for each overburden hole.

TABLE 1

Drill Hole ID	Percent Sulfur	Neutralization Potential	Acid-Base Account	Tons/Acre Excess $CaCO_3$
MW-1/OB-1	0.0076	9.0006	8.7632	832
MW-2/OB-2	0.0820	4.8328	2.2688	631
MW-3/OB-3	0.0520	5.2500	3.6261	819
MW-4/OB-4	0.0621	9.2536	7.3120	1696
OB-5	0.0306	19.3148	18.3576	4287
OB-6	0.0304	7.4337	6.3727	830
AVERAGE	0.0441	9.1809	7.7834	1515.83

EXHIBIT 2.2

OVERBURDEN SAMPLE LITHOLOGIC LOGS

EXHIBIT 2.3

OVERBURDEN CHEMICAL ANALYSIS

EXHIBIT 2.4

OVERBURDEN SPREADSHEETS

SAMPLING TECHNIQUES

As depicted on the attached Soils Map, soil and overburden samples were taken at locations throughout the proposed permit area. This map also shows the proposed mine site (permit boundary), soil types present within the permit area, topsoil and overburden collection sites.

Topsoil Samples were taken by digging a cylindrical to slightly conical shaped hole with a spade ten (10") inches to twelve (12") inches in depth after removing the top unconsolidated surface mulch where present. All material removed from the excavated section is included in the sample. Topsoil samples were logged, located by GPS and stored in new, one-gallon, clean plastic pails. Samples collected were conveyed to Bhate Geosciences Corporation located in Birmingham, Alabama where sieve analyses were conducted on oven-dried composite samples to determine coarse fragment and soil percentages. Results of these analyses and graphical representations of screening results are listed in Table 2.

Overburden samples were taken by collecting the cuttings from rotary drilled holes. These cuttings were sampled at each strata change, or at a minimum of five (5') foot intervals. At each interval limit, the drill down-pressure was disengaged to allow all cuttings generated from the drilling operation to be blown from the drillhole before proceeding with the next interval and prevent contamination of the sampled interval. Cuttings were collected, logged and stored in gallon size zip-lock bags. Samples collected in the field were then sorted in chronological order, packed and shipped for analysis to Standard Laboratories, Inc. located in Whitesburg, Kentucky.

The minus 2 mm (soil) fraction of all samples are collected and sent to Auburn University Soil Testing Laboratory for the following analyses: soil fertility; pH; recommendation for post-mining revegetation; percent (%) sand; percent (%) silt; percent (%) clay; CEC; available water capacity*; neutralization potential; maximum potential acidity; percent (%) organic matter and parts per million (ppm) of nitrate nitrogen in the soil. Results of these analyses are shown in Table 3.

***NOTE**: Available water capacity conducted by Auburn University Testing Laboratory is determined on only the soil (-2mm) fraction of the sample. To obtain a "total" available water capacity, the AWC should be multiplied by the fraction of the soil sample obtained in the field. See Table 4 for an Estimation of the Total Available Water Capacity.

TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#001**
Soil Designation at Sample Point: **Sipsey-Bankhead Complex (ShE), 15-45% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **825.4 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	14.1	1.7	1.7	98.3
¼"	9.50	29.3	3.6	5.3	96.5
4	4.75	67.1	8.1	13.4	91.9
10	2.00	92.5	11.2	24.6	88.8
Pan	---	622.4	75.4	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **24.6%** soil: **75.4%**

Average size left in 1" Sieve: **0"**

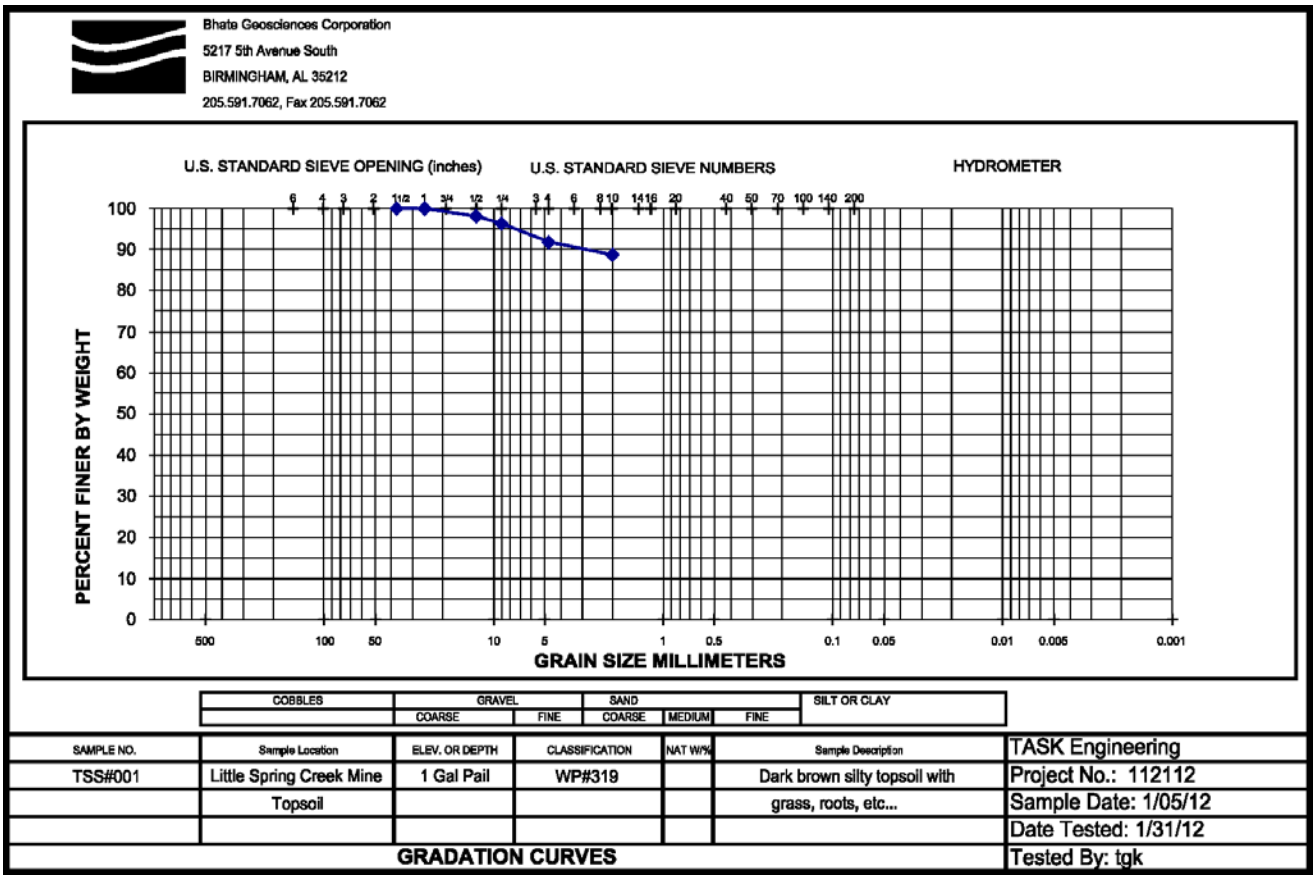


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#002**
Soil Designation at Sample Point: **Sipsey-Bankhead Complex (ShE), 15-45% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **776.07 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	22.7	2.9	2.9	97.1
¼"	9.50	25.9	3.3	6.2	96.7
4	4.75	32.1	4.1	10.3	95.9
10	2.00	39.4	5.1	15.4	94.9
Pan	---	655.97	84.6	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **15.4%** soil: **84.6%**
Average size left in 1" Sieve: **0"**

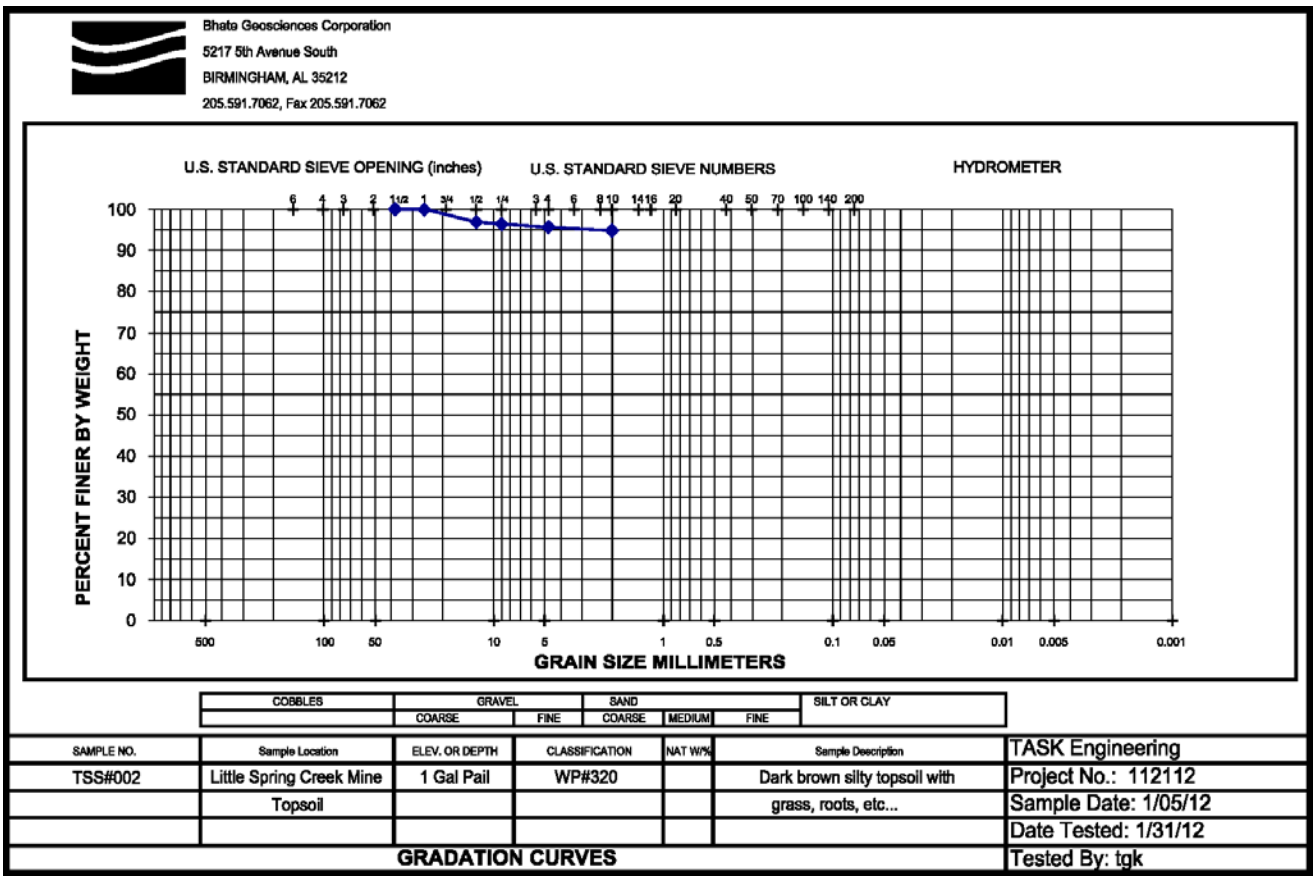


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#003**
Soil Designation at Sample Point: **Pruitton Loam (PrA), 0-2% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **611.63 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	0.0	0.0	0.0	100.0
¼"	9.50	2.3	0.4	0.4	99.6
4	4.75	2.8	0.5	0.9	99.5
10	2.00	5.8	1.0	1.9	99.1
Pan	---	600.73	98.1	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **1.9%** soil: **98.1%**

Average size left in 1" Sieve: **0"**

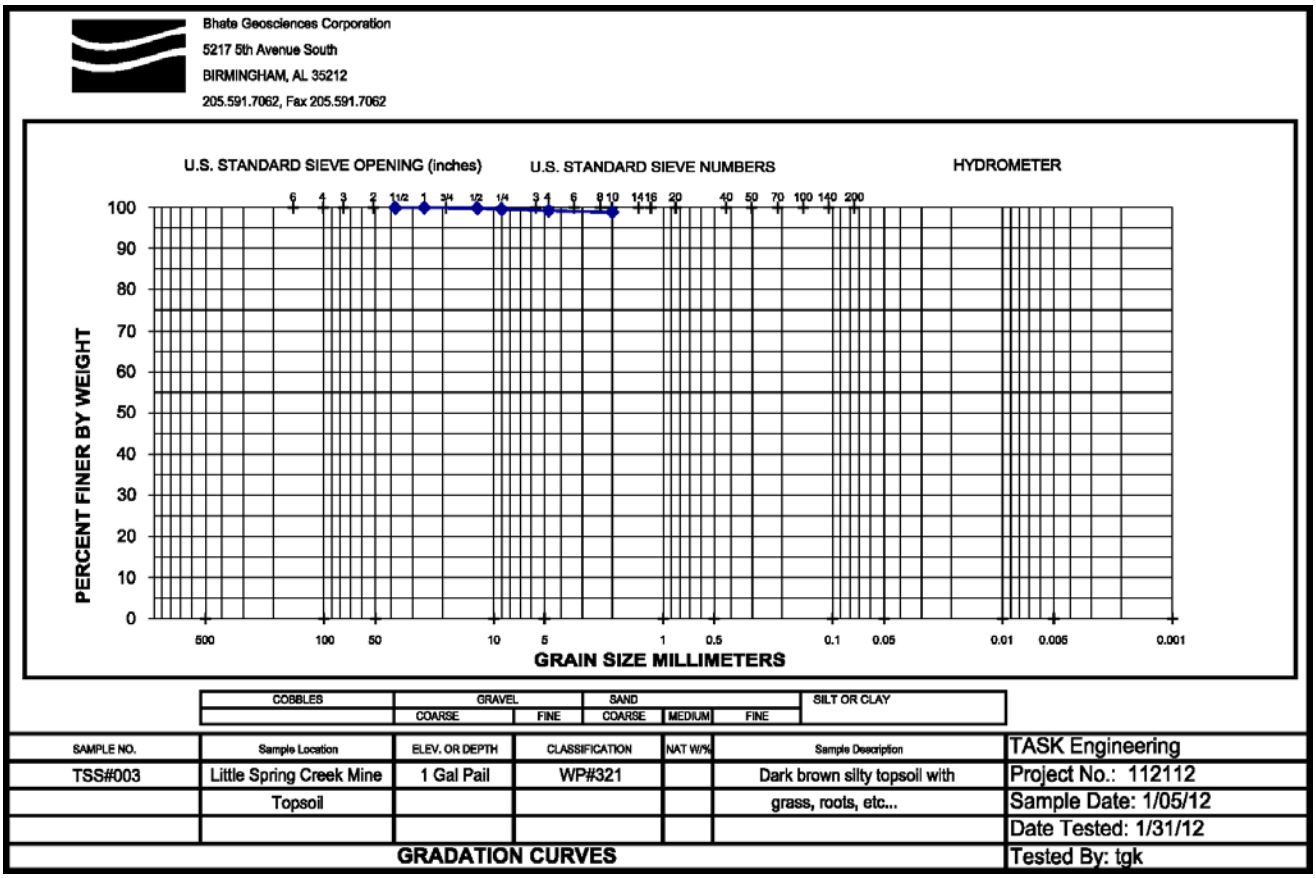


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#004**
Soil Designation at Sample Point: **Sipsey-Bankhead Complex (ShE), 15-45% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **732.14 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Finer
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	16.3	2.2	2.2	97.8
¼"	9.50	21.8	3.0	5.2	97.0
4	4.75	68.7	9.4	14.6	90.6
10	2.36	109.6	15.0	29.6	85.0
Pan	---	515.74	70.4	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **29.6%** soil: **70.4%** Average size left in 1" Sieve: **0"**

Average size left in 1" Sieve: **0"**

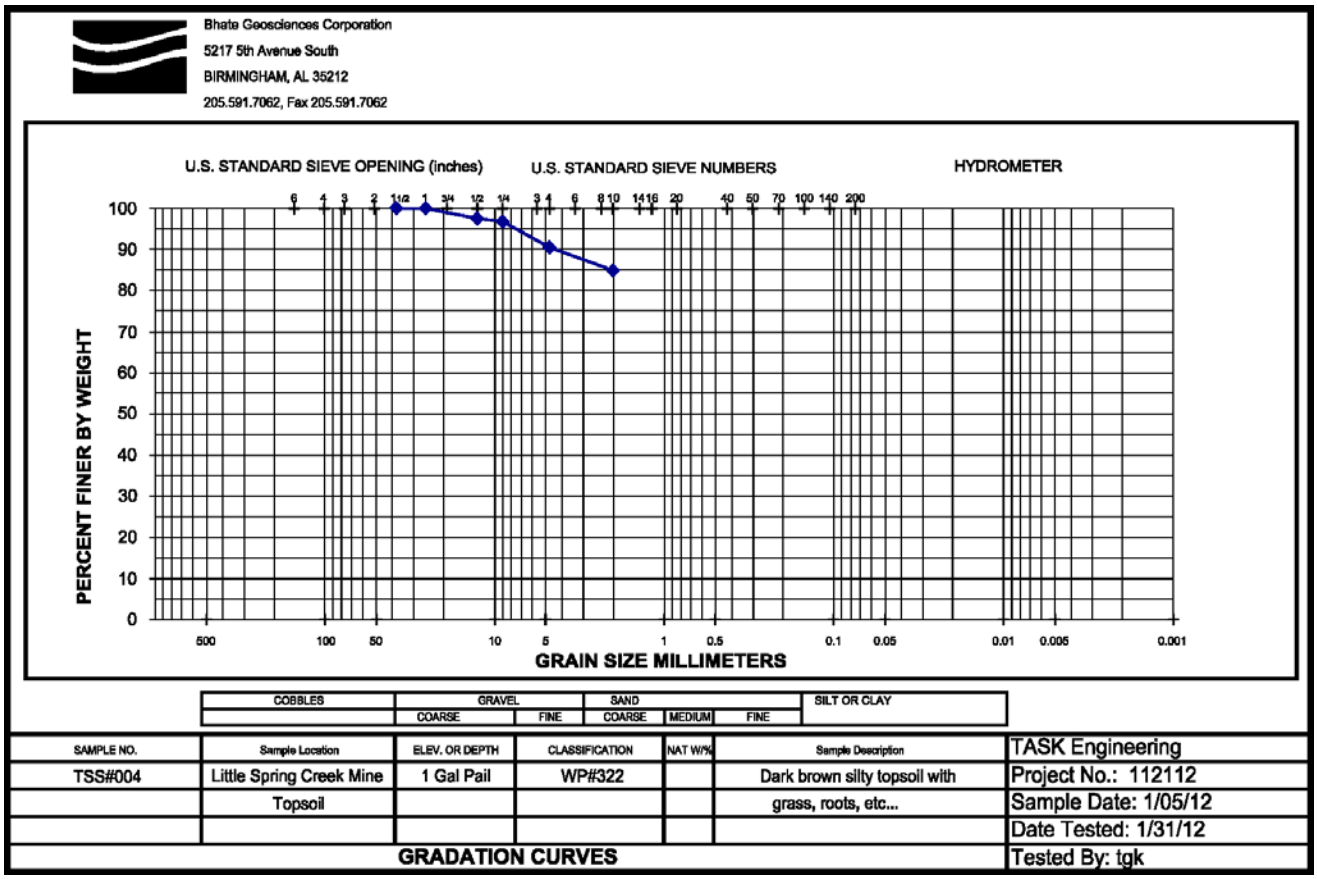


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#005**
Soil Designation at Sample Point: **Sipsey Loamy Sand (SeE), 4-18% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **697.02 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	0.0	0.0	0.0	100.0
¼"	9.50	0.8	0.1	0.1	99.9
4	4.75	7.8	1.1	1.2	98.9
10	2.00	11.2	1.6	2.8	98.4
Pan	---	677.22	97.2	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **2.8%** soil: **97.2%**

Average size left in 1" Sieve: **0"**

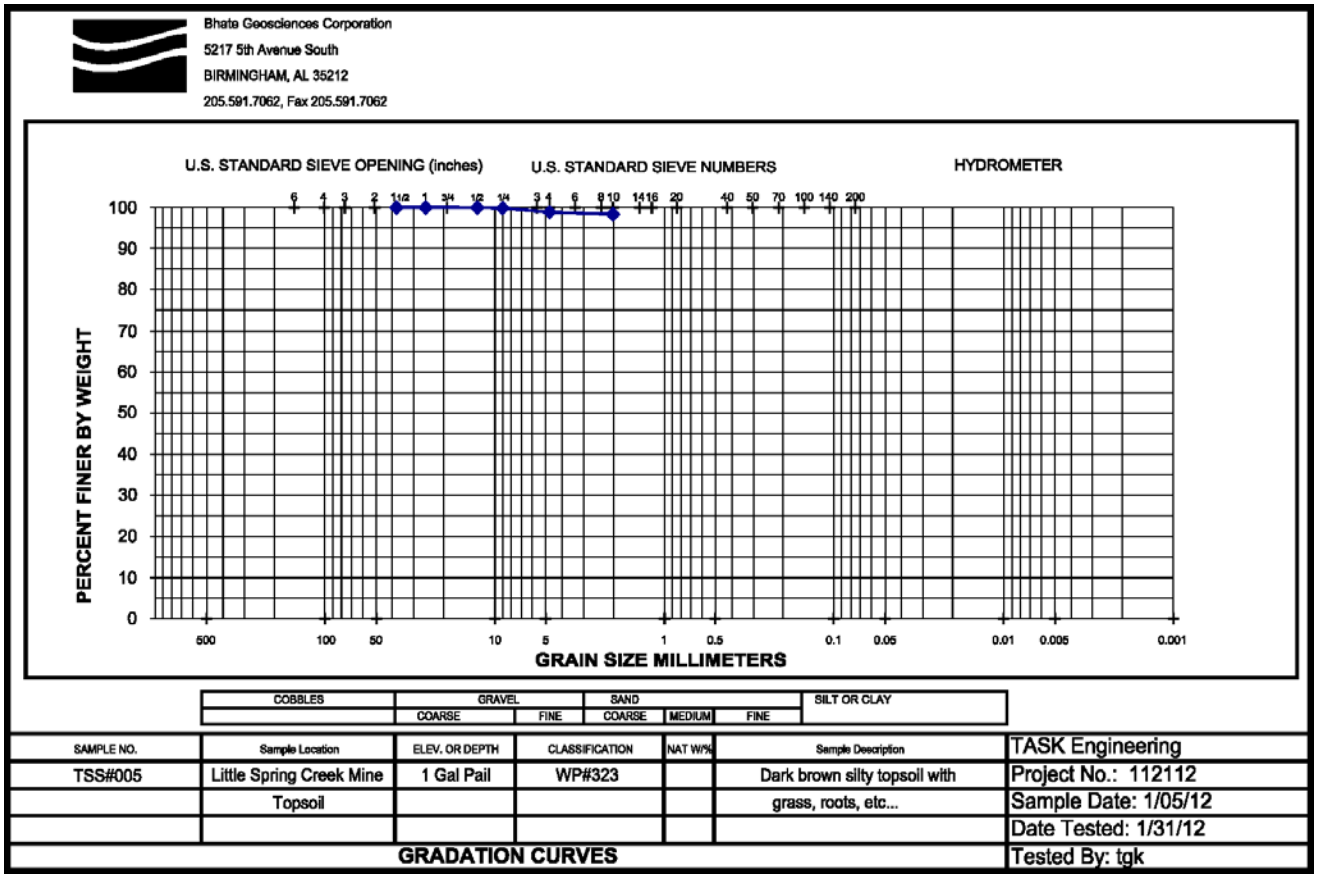


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#006**
Soil Designation at Sample Point: **Sipsey-Bankhead Complex (ShE), 15-45% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **790.15 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	50.0	6.3	6.3	93.7
¼"	9.50	74.0	9.4	15.7	90.6
4	4.75	152.6	19.3	35.0	80.7
10	2.00	208.6	26.4	61.4	73.6
Pan	---	304.95	38.6	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **61.4%** soil: **38.6%**

Average size left in 1" Sieve: **0"**

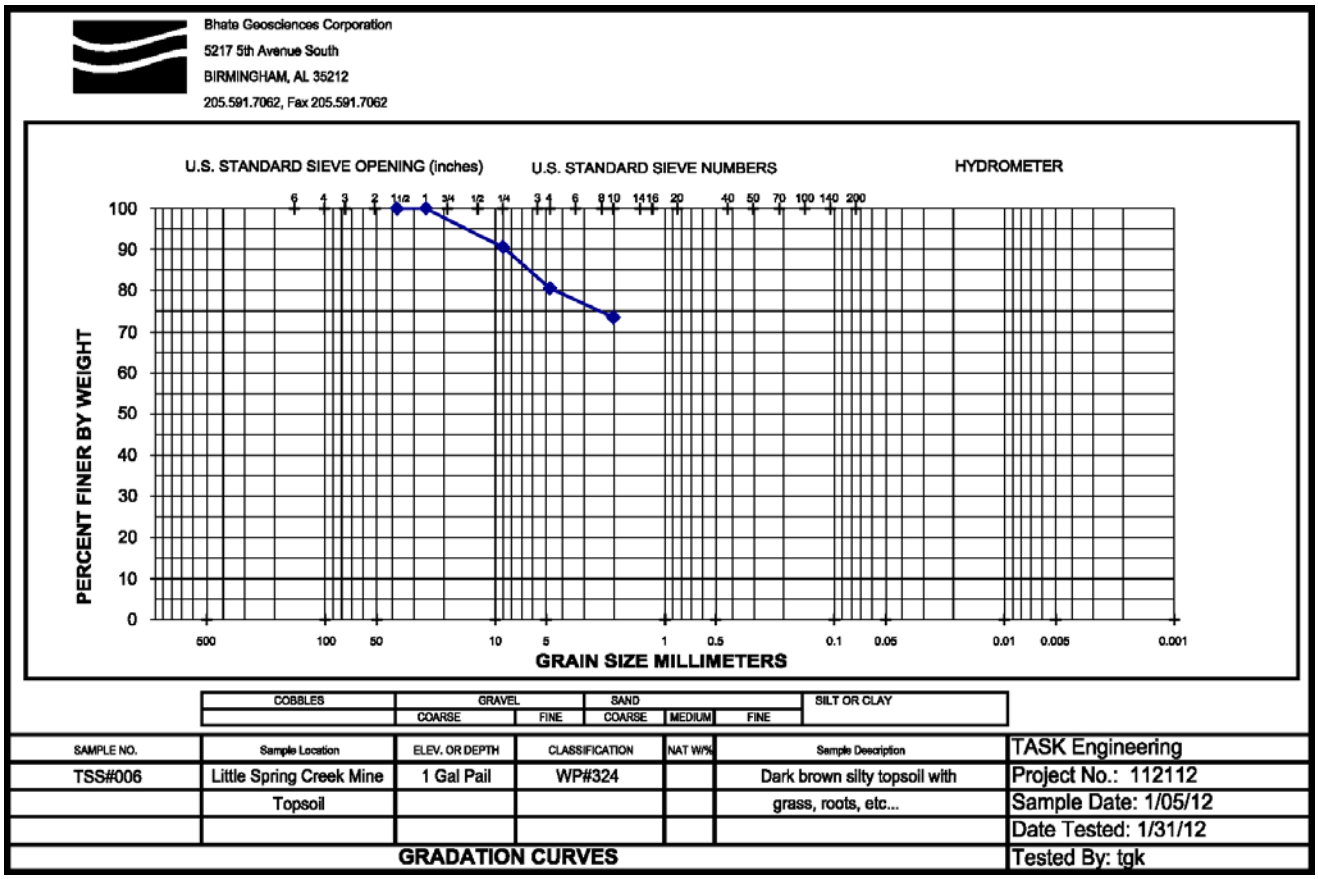


TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc.**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#007**
Soil Designation at Sample Point: **Nauvoo-Townley Complex (NaE), 4-20% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **1060.30 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	0.0	0.0	0.0	100.0
¼"	9.50	0.5	0.1	0.1	99.9
4	4.75	2.3	0.2	0.3	99.8
10	2.00	4.7	0.4	0.7	99.6
Pan	---	1052.80	99.3	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **0.7%** soil: **99.3%**

Average size left in 1" Sieve: **0"**

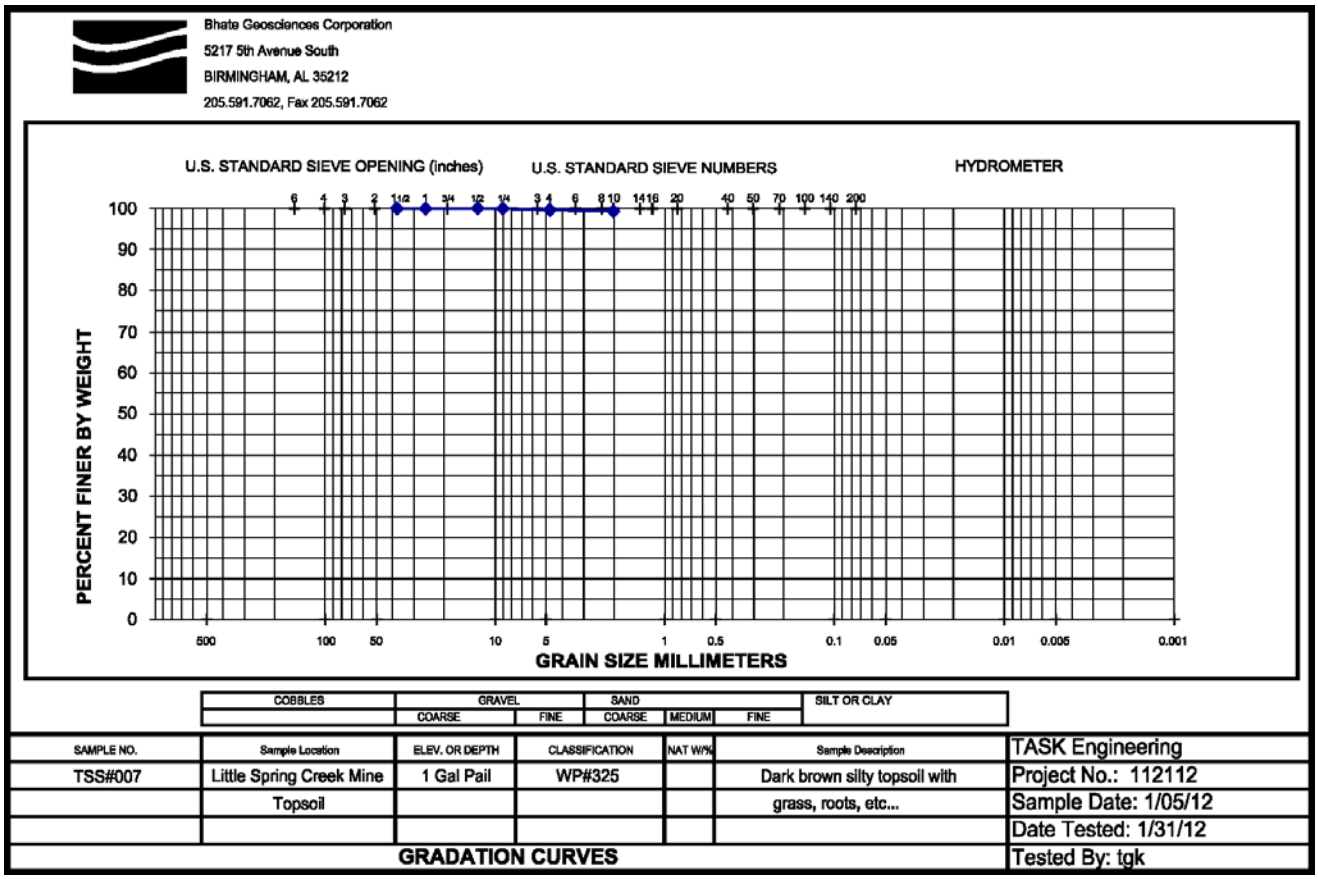


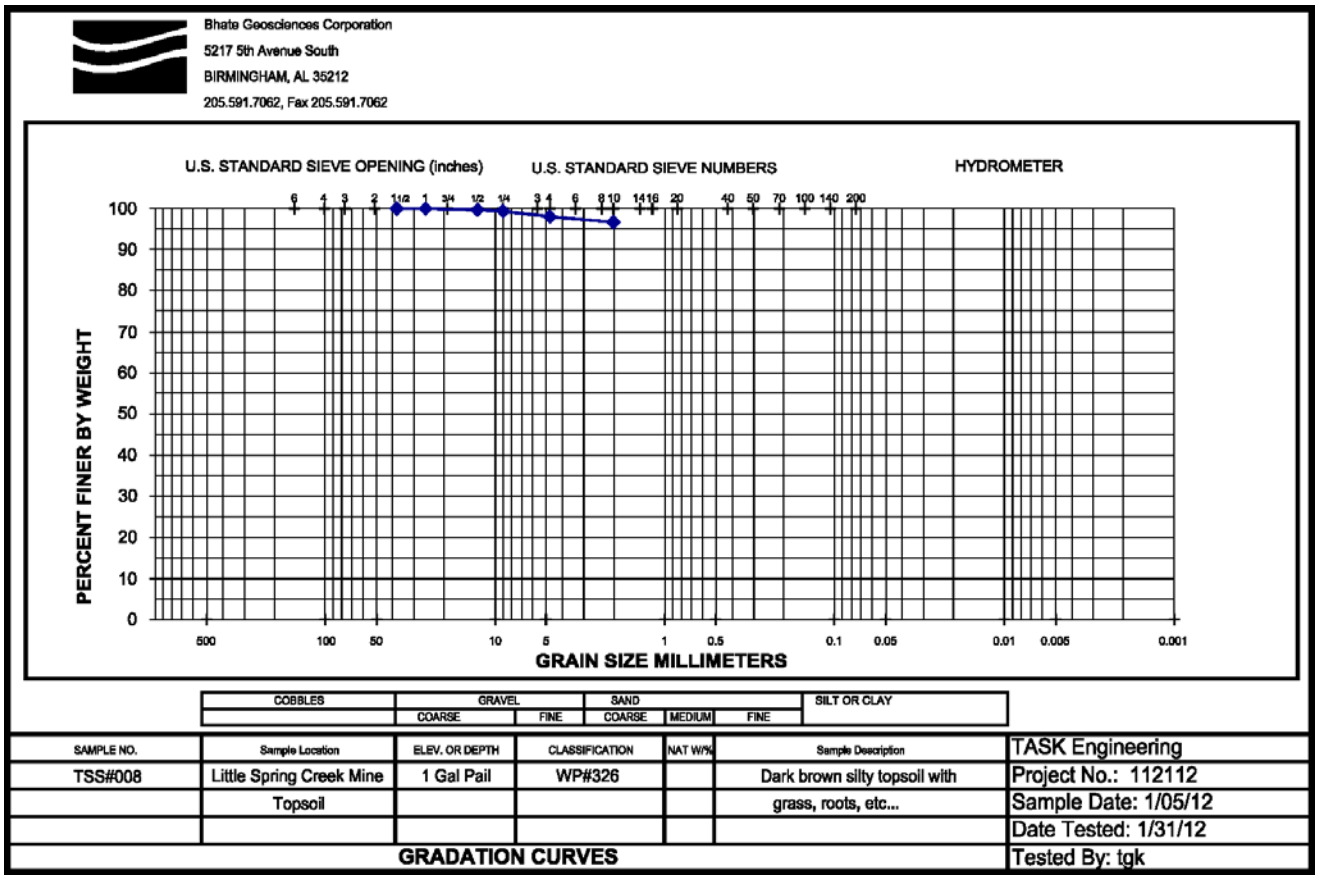
TABLE 2 - SIEVE ANALYSIS

Company Name: **Cedar Lake Mining, Inc**
Mine Name: **Little Spring Creek East Mine, P-3968**
Sample I.D.: **TSS#008**
Soil Designation at Sample Point: **Sipsey Loamy Sand (SeE), 4-18% Slopes**
Sampled: **1/05/2012**
Analyzed: **1/31/2012**
Analyzed By: **Bhate Geosciences Corporation**
Sample Weight: **627.12 gm**

Sieve No.	Sieve Opening (mm)	Weight Retained on each Sieve (gm)	Percent of Weight Retained on each Sieve	Cumulative Percent Retained	Percent Passing
1½"	37.50	0.0	0.0	0.0	100.0
1"	25.00	0.0	0.0	0.0	100.0
½"	12.50	1.4	0.2	0.2	99.8
¼"	9.50	2.8	0.5	0.7	99.6
4	4.75	13.1	2.1	2.8	97.9
10	2.36	20.6	3.3	6.1	96.7
Pan	---	589.22	93.9	100.0	0.0

Percentage (%) of sample that is: coarse fragments: **6.1%** soil: **93.9%**

Average size left in 1" Sieve: **0"**



CHEMICAL ANALYSIS COMPARISONS

Examination of the physical and chemical comparison between the average of the topsoils within the permit area and the average of the overburden samples collected reveals that selected overburden at the Little Spring Creek East Mine is more suitable as a plant growth medium than the natural topsoils present at the site. The pH of the topsoils ranged between 6.00 and 6.60 and the pH of the selected overburden samples (drill holes OB-1, OB-2, OB-3, OB-4, OB-5 and OB-6) ranged between 3.94 and 7.87. The post mine land use is proposed to be Undeveloped/No Current Use.

Soil testing provided by Auburn University resulted in the following recommendations for an average addition of amendments per acre to naturally occurring topsoils:

- Limestone (LS): 0.0 tons/acre
- Nitrogen (N): Sixty (60) pounds/acre
- Phosphate (P_2O_5): 0.0 pounds/acre
- Potassium/Potash (K_20): Fifty-seven and one half (57.50) pounds/acre

The acid-base accounts for the natural soils are slightly negative according to the Neutralizing Potential and Maximum Potential Acidity reported by Auburn soil testing results while the selected overburden materials as reported from overburden analysis holes (drill holes) was substantially more positive with significantly higher neutralization potential than the natural soils.

TEXTURAL ANALYSIS COMPARISONS

Textural analyses of the topsoil samples classified all eight (8) topsoil samples as Sand by Auburn University Testing Lab. Relative percentages indicated an excess of ninety (90%) percent sand with low silt values on all samples and extremely low clay content on samples TSS#006, TSS#007 and TSS#008. Exploratory drilling at the site indicated an upper layer of relatively unconsolidated sand and loosely cemented, coarse grained sandstones across the extent of the proposed mine site. While topsoil samples on undisturbed areas indicated a relatively pH values at 6.0 or above and is considered mildly acidic, it should also be noted that other than strata adjacent (immediately above or below) to the coal seam or the coal seam itself, the lowest pH values recorded in overburden sampling holes OB#1, OB#3, OB#4, OB#5 and OB#6 were recorded within the top five (5') feet. As shown by the thickness-weighted averages for each overburden hole (TABLE 1), the overburden at this site would produce a substantial excess of alkaline materials than the native soils and would be superior as reclamation materials.

The available water capacity for the Sipsey-Bankhead Complex, 15-35% slopes is 0.0500 cm^3/cm^3 and the available water capacity for the Sipsey Loamy Sand, 4-18% slopes is 0.0550 cm^3/cm^3. Lower AWC values reflect the relatively unconsolidated sands and loosely cemented coarse grained sandstone layers associated with the Pottsville formation of the upper strata layers at this site.

Topsoil at the site is thin and in several areas has basically been removed by logging and mechanical equipment operation associated with logging. Basic clearing operations in the mining process would remove most available topsoils and associated subsoils to expose the acid subsoils as denoted by overburden sampling.

As shown by the average of +1515.83 tons/acre Excess $CaCO_3$ from TABLE 1, the overburden produced in mining at this site is superior to native soils for surface mine revegetation and therefore satisfies the criteria set forth in section 880-X-10C.08(5).

TABLE 3

TOPSOIL VS. OVERBURDEN COMPARISON

	Sipsey-Bankhead Complex 15-35% (range)	Sipsey Loamy Sand 4-18% (range)	SELECTED OVERBURDEN OB-1, OB-2, OB-3, OB-4, OB-5, and OB-6 (range)
pH (low)	6.0	6.2	3.94
pH (high)	6.6	6.4	7.87

EXTRACTABLE NUTRIENTS FOR P, K, & Mg (lbs/acre)

	Sipsey-Bankhead Complex 15-35% (average)	Sipsey Loamy Sand 4-18% (average)	SELECTED OVERBURDEN OB-1, OB-2, OB-3, OB-4, OB-5, and OB-6 (average)
PHOSPHOROUS	146.75	88.0	N/A
POTASSIUM	37.75	31.88	N/A
MAGNESIUM	30.25	29.50	N/A
CALCIUM	195.75	179.50	N/A

RECOMMENDATIONS - LIMESTONE, N, P_2O_5, K_2O:

	Sipsey-Bankhead Complex 15-35% (average)	Sipsey Loamy Sand 4-18% (average)	SELECTED OVERBURDEN OB-1, OB-2, OB-3, OB-4, OB-5, and OB-6 (average)
LIMESTONE (tons/acre)	0.0	0.0	N/A
NITROGEN (tons/acre)	60.0	60.0	N/A
P_2O_5 (lbs/acre)	0.0	0.0	N/A
K_2O (lbs/acre)	52.50	60.0	N/A
NO_3 - N (ppm)	3.93	3.35	N/A

TABLE 3

TOPSOIL VS. OVERBURDEN COMPARISON
(continued)

	Sipsey-Bankhead Complex 15-35%	Sipsey Loamy Sand 4-18% (average)	SELECTED OVERBURDEN OB-1, OB-2, OB-3, OB-4, OB-5, and OB-6 (average)
NEUTRALIZAION POTENTIAL	0.1375	0.0	+9.1806
MAXIMUM POTENTIAL ACIDITY	0.5875	0.6450	+1.2114
SULFUR (%)	0.0185	0.0205	0.0441
ACID-BASE ACCOUNT	-0.4500	-0.6450	+7.9692
SAND (%)	93.44	91.88	N/A
SILT (%)	5.94	6.88	N/A
CLAY (%)	0.62	1.24	N/A
AVAILABLE WATER CAPACITY (cm^3/cm^3)	0.0500	0.0550	N/A
COARSE FRAGMENTS (%)	32.7	4.4	N/A
SOIL (%)	67.3	95.6	N/A
TOTAL AVAILABLE WATER CAPACITY (cm^3/cm^3)	0.0444	0.0528	N/A
SOIL ERODIBILITY FACTOR "K"	0.30	0.30	N/A

TABLE 4

TOTAL AVAILABLE WATER CAPACITY

Sipsey-Bankhead Complex (ShE) 15-35%

PERCENT OF SAMPLE RETAINED

SAMPLE I.D.	1"	½ "	¼ "	>2 mm
TSS#001	0.0	1.7	3.6	19.3
TSS#002	0.0	2.9	3.3	9.2
TSS#004	0.0	2.2	3.0	24.4
TSS#006	0.0	6.3	9.4	45.7
AVERAGE	**0.0**	**3.3**	**4.8**	**24.7**

SIEVE OPENING	PERCENT RETAINED	AWC FACTOR	AWC cm^3/cm^3
1"	0.0	0.0389	0.0000
½"	3.3	0.0492	0.0016
¼"	4.8	0.0603	0.0029
>2 mm	24.7	0.1149	0.0283
TOTAL			**0.0328**

< 2 mm average from Table 1: 67.3%
> 2 mm average from Table 1: 32.7%

Average available water capacity of < 2 mm from Auburn Data = 0.0500 cm^3/cm^3

67.3% X 0.0500 cm^3/cm^3 = 0.0337 cm^3/cm^3
32.7% X 0.0328 cm^3/cm^3 = 0.0107 cm^3/cm^3

TOTAL = 0.0444 cm^3/cm^3

Average Total Available Water Capacity for the Native Soils = 0.0444 cm^3/cm^3

*Available water capacity values were obtained from "A Method of Comparing Soil Materials for Plant Available Water" supplied by the Alabama Surface Mining Commission.

TABLE 4

TOTAL AVAILABLE WATER CAPACITY

Sipsey Loamy Sand (SeE) 15-35%

PERCENT OF SAMPLE RETAINED

SAMPLE I.D.	1"	½ "	¼ "	>2 mm
TSS#005	0.0	0.0	0.1	2.7
TSS#008	0.0	0.2	0.5	5.4
AVERAGE	**0.0**	**0.1**	**0.3**	**4.1**

SIEVE OPENING	PERCENT RETAINED	AWC FACTOR	AWC cm^3/cm^3
1"	0.0	0.0389	0.0000
½"	0.1	0.0492	0.0001
¼"	0.3	0.0603	0.0002
>2 mm	4.1	0.1149	0.0047
TOTAL			**0.0050**

< 2 mm average from Table 1: 95.6%
> 2 mm average from Table 1: 4.4%

Average available water capacity of < 2 mm from Auburn Data = 0.0550 cm^3/cm^3

95.6% X 0.0550 cm^3/cm^3 = 0.0526 cm^3/cm^3
4.4% X 0.0050 cm^3/cm^3 = 0.0002 cm^3/cm^3

TOTAL = 0.0528 cm^3/cm^3

Average Total Available Water Capacity for the Native Soils = 0.0528 cm^3/cm^3

*Available water capacity values were obtained from "A Method of Comparing Soil Materials for Plant Available Water" supplied by the Alabama Surface Mining Commission.

CONCLUSION

The pH of the native topsoil is relatively equal to the overburden materials as shown by the overburden sample holes with the exception of the top five (5') feet of the geologic column. The average acid-base account of the selected overburden (drill holes OB#1, OB#2, OB#3, OB#4, OB#5 and OB#6) was +7.9692 while the native topsoils, Sipsey Bankhead Complex has an average acid-base account of -0.4500 and Sipsey Loamy Sand has an average acid-base account of -0.6450. Low pH values occur within the top five (5') feet of the existing soils, which could cause acidic conditions which would be detrimental to successful reclamation operations if not blended with other overburden materials at the site.

As shown in this study the overburden material at the Little Spring Creek East Mine site is more suitable for sustaining revegetation and is the best to support reclamation operations and therefore satisfies the criteria set forth in section 880-X-10C.08-(5).

OVERBURDEN RESTABILIZATION PLAN

All overburden shall be backfilled, compacted, and graded so that the post mining slope shall approximate the pre-mining slope (See Attachment IV-B-3) and in a timely manner (See Part IV-B-2). Overburden will be rough graded with Caterpillar type dozers. Once rough grading has been completed, a farm-type tractor will be used to disc the overburden to its final contour, decrease compaction, and increase the mechanical breakage of the surface layer. If any rocks +24 inches in diameter remain on the surface, they will be collected and buried. All slopes too steep to operate farm equipment on will use the following criteria to evaluate the textural quality of the graded overburden:

A) Rocks of size larger than ten (10") inches shall not exceed 10% by weight of the substitute material, and no rocks larger than twenty four (24) inches can be included in the substitute material.

B) Rock between three (3") inches and ten (10") inches in size shall not exceed 15% by weight of the topsoil substitute material.

C) The substitute material shall not contain more than 50% by weight of materials between three (3") inches and three quarters (¾") inches in size.

D) The substitute material shall contain at least 30% by weight of material less than two (2mm) millimeters in size.

Sampling frequency shall be one (1) sample per twenty (20) acres. Overburden sampling will follow the guidelines as described in the "SAMPLING TECHNIQUES" section of this report.

Based on the sieve analysis shown in Table 2 the overburden material meets the grading requirements for a Topsoil Variance. The final texture samples will be sent to the Auburn University Soil Laboratory where the following tests will be conducted: percent (%) sand, silt, and clay; textural classification; pH, percent (%) sulfur; fertility ratings for phosphorus,

potassium, and magnesium; and amendment recommendations for limestone, nitrogen, phosphorus, and potassium. An acid-base account will be calculated from the sulfur and neutralization potential readings. Results of these analyses will be used to determine the amount of soil amendments, if any, to be applied to the plant medium. All results of analyses will be submitted to the Regulatory Authority for review. Any acid-forming materials encountered will be covered with four (4) feet of non-toxic, non-acid forming material.

AUBURN SOIL TESTING LAB

SOIL TEST - MINE ANALYSIS REPORT

LABORATORY TEST RESULTS

Report on Soil Test

Auburn University Soil Testing Laboratory

Auburn University, AL 36849-5411

Task Engineering Mgmt Inc

2832 Monte Deste Dr

Birmingham, AL 35216

County:Jefferson

District:1

					SOIL TEST RESULTS					RECOMMENDATIONS		
LAB No.	Test Date	Sample Designation	Crop	Soil Group*	pH**	Phosphorus P***	Potassium K***	Magnesium Mg***	Calcium Ca***	LIME-STONE	N	P_2O_5	K_2O
						Pounds/Acre				Tons/Acre	Pounds/Acre		
12007	02/21/12	Little Spring Crk 64 LSC TS01 See Comment 1	Revegetation	1	6.3	VH 123	M 44	H 39	M 294	0.0	60	0	40
12008	02/21/12	64 LSC TS02 See Comment 1	Revegetation	1	6.6	H 76	VL 20	L 19	L 124	0.0	60	0	70
12009	02/21/12	64 LSC TS03 See Comment 1	Revegetation	1	6.4	H 79	L 36	L 24	L 130	0.0	60	0	50
12010	02/21/12	64 LSC TS04 See Comment 1	Revegetation	1	6.4	VH 108	L 29	L 21	L 115	0.0	60	0	60
12011	02/21/12	64 LSC TS05 See Comment 1	Revegetation	1	6.4	H 70	VL 20	L 23	L 139	0.0	60	0	70
12012	02/21/12	64 LSC TS06 See Comment 1	Revegetation	1	6.0	EH 280	M 58	H 42	M 250	0.0	60	0	40
12013	02/21/12	64 LSC TS07 See Comment 1	Revegetation	1	6.5	H 73	VL 19	L 19	L 124	0.0	60	0	80
12014	02/21/12	64 LSC TS08 See Comment 1	Revegetation	1	6.2	VH 106	M 42	H 36	M 220	0.0	60	0	50

Comment No.1: For perennial winter grass pasture, apply N, P, and K as recommended by September 1. Repeat N application in February. If grass is to be cut for hay, in February apply up to 40 pounds N and 35 pounds K2O per ton of anticipated hay yield.

The number of samples processed in this report is: 8

For further information call your county agent: (205) 879-6964

* 1. Sandy soil (CEC ‹ 4.6 $cmol_c kg^{-1}$)

* 2. Loams and Light clays (CEC = 4.6-9.0 $cmol_c kg^{-1}$)

* 3. Clays and soils high in organic matter (CEC > 9.0 $cmol_c kg^{-1}$)

* 4. Clays of the Blackbelt (CEC > 9.0 $cmol_c kg^{-1}$)

** 7.4 or higher - Alkaline - - - - - - - - - - - - - - 6.6-7.3 - Neutral - - - - - - - - - - - - - 6.5 or lower - Acid - - - - - - - - - - - - -5.5 or lower - Strong Acid

*** Extractable nutrients in pounds per acre

If soil group = 1, 2 or 3, Method of Analysis = Mehlich-1. If soil group = 4, Method of Analysis = Miss/Lancaster.

Approved by: Joseph Huluka

Print Date: April 2, 2012

Mine Analysis Report
Auburn University
Soil Testing Lab

Task Engineering Management Inc.
2832 Monte Deste Dr
Birmingham Al 35216
County: Jefferson

ALFA Agricultural Service & Research Building
961 S. Donahue Dr.
Auburn University, Auburn, AL 36849-5411
Phone (334)844-3958
Soillab@auburn.edu

SAMPLE NAME: 64-Little Spring Creek ROUTINE #: 12007-12014 Special Analysis #: 12.G0055-G0062 4/2/2012

		MULTIPLE SULFUR ANALYSES								
		%	%	%	%	%	OM	NO_3-N	Neutralizing Potential	
Lab No	Sample I.D.	1rst	2nd	3rd	4rth	Ave	%	ppm	Tons $CaCO_3$/1000 Tons material	max pot.acid.
12007	64-LSC-TS01	0.020	0.029	0.033	0.019	0.025	2.9	2.9	<1.0	0.79
12008	64-LSC-TS02	0.014	0.017	0.011	0.011	0.013	0.2	2.6	<1.0	0.42
12009	64-LSC-TS03	0.022	0.018	0.014	0.015	0.017	0.8	2.6	<1.0	0.54
12010	64-LSC-TS04	0.0094	0.012	0.019	0.013	0.013	0.5	3.5	<1.0	0.42
12011	64-LSC-TS05	0.017	0.018	0.0077	0.014	0.014	0.4	2.5	<1.0	0.44
12012	64-LSC-TS06	0.016	0.040	0.022	0.014	0.023	1.7	6.7	1.1	0.72
12013	64-LSC-TS07	0.012	0.010	0.010	0.011	0.011	0.6	3.3	<1.0	0.33
12014	64-LSC-TS08	0.036	0.023	0.027	0.024	0.027	1.8	4.2	<1.0	0.85

		%	%	%		H_2O avail.					
Lab I.D.	Sample I.D.	Sand	Silt	Clay	Textural Class	cm^3/cm^3					
12007	64-LSC-TS01	92.50	7.50	0.00	Sand	0.05					
12008	64-LSC-TS02	97.50	2.50	0.00	Sand	0.04					
12009	64-LSC-TS03	92.50	7.50	0.00	Sand	0.04					
12010	64-LSC-TS04	93.75	6.25	0.00	Sand	0.04					
12011	64-LSC-TS05	91.25	8.75	0.00	Sand	0.04					
12012	64-LSC-TS06	90.00	7.50	2.50	Sand	0.07					
12013	64-LSC-TS07	96.25	1.25	2.50	Sand	0.07					
12014	64-LSC-TS08	92.50	5.00	2.50	Sand	0.07					