MEMORANDUM

TO: Tennessee Underground Storage Tanks and Solid Waste Disposal Control Board

FROM: John R. Anderson
Authorized Representative
LOP, LLC
633 Chestnut Street, Suite 900
Chattanooga, TN 37450-0900

DATE: February 5, 2020

RE: UST Board Meeting
February 5, 2020, 9:30 a.m.
William R. Snodgrass Tower
312 Rosa L. Parks Avenue
Nashville, TN

At the February 5, 2020 meeting, Anthony Wheeler made a presentation concerning the Signal Mountain Sewanee Coal Seam Proposed Development Concerns. My name is John R. Anderson, and I am the Chief Manager of LOP, LLC. I have prepared this Memorandum to the Board to be sure that certain information has been properly provided to the Board.

Anthony Wheeler is neither a geologist, nor a geotechnical engineer. Mr. Wheeler has made it abundantly clear at several meetings, including one that he held on September 5, 2019 at Bachman Community Center on Signal Mountain, that he is not licensed as a geologist, he is not educated as a geologist, he is not a licensed geotechnical engineer and holds no special expertise or training in either of those fields. Additionally, he is not an expert as it relates to coal operations, coal seams or any matter of the coal industry. Mr. Wheeler is not relying on information that is current as it related to the coal concerns he addressed here today. In Mr. Wheeler's materials, he references that the Sewanee Coal Seam contains 20,000,000 tons of bituminous coal. He has not indicated the basis for that estimation of the amount of coal, and he does not indicate in his materials any support when he says much of it is disposed in the Middle Creek Watershed.

Mr. Wheeler indicated in his materials that the Town of Walden approved the "creation of a strip center development." That is an incorrect statement and should be clarified. The Town of Walden did approve under its Village Commercial Zoning the development of a town center which would involve a grocery store, small shops, as well

as passive green space in the development and several acres of land to be dedicated to the Town of Walden to be used at Walden's discretion, preferably for a park. Mr. Wheeler indicates that development is going to be at the top of a water shed over known mining activity, the coal seam acid mine drainage adjacent to and under the site. Mr. Wheeler does not mention in his materials that the Tennessee Department of Environment and Conservation has been contacted, has been involved and has indicated that it does not find any mining activity under the site which is owned by LOP, LLC, which is the entity to pursue the change in zoning in the Town of Walden. A copy of that email exchange with the Tennessee Department of Environment and Conservation which also includes information from the Department about mining activities is attached hereto as Exhibit 1. Trevor Martin with the Tennessee Department of Environment and Conservation has been the primary contact person on this site.

Mr. Wheeler relies in large part on two things to support his concerns, and that is a 1963 minerals survey and a great deal of hearsay as it relates to information relating to the mines. Also at the September 5, 2019 meeting, Mr. Wheeler neglected to identify to the audience that this coal seam that is such a problem for a grocery store also continues along the mountain and is under the Signal Mountain Middle High School, which was built about 10 years ago. Mr. Wheeler further goes on to say that there is a number of mines throughout the top of the mountain. He also fails to mention that there are currently three (3) other gas stations on Signal Mountain and that some of those gas stations are situated no differently.

As a lawyer who has been involved in development activities in Tennessee for nearly 40 years, I have been involved in underground storage tanks in both the removal, remediation and installation of the tanks. The underground storage tank regulatory scheme by the State of Tennessee is outstanding, provides sufficient regulatory oversight and direction to ensure the public safety. One of the primary purposes of the underground storage tanks regulatory scheme is to prevent groundwater contamination, and the Underground Storage Tank Board and the administration of the rules and regulations as have been duly promulgated is done with great care, efficiency and oversight.

The Underground Storage Tank program in Tennessee addressed concerns on installation, and it is the intent of the owner in the development of the property that there will be complete compliance with all the regulatory aspects, both with the underground storage tanks and any and all of the permitting that is required.

What Mr. Wheeler is concerned about is that he wants nothing to be developed near his property. It is not a matter of the underground storage tanks, it is a matter that he is unhappy that the development is coming. Evidence of that exists that in January of 1999, Mr. Wheeler spoke against a townhome development being proposed by Bill Raines north of the LOP site. He was stridden in his opposition to that rezoning. What is clear is that Mr. Wheeler attempts to mask his opposition in some sort of plausible

concern about underground storage tanks when it is not his concern about underground storage tanks or stormwater runoff, it is simply a method to propose opposition.

The Walden Mayor and Board of Aldermen have approved in final the zoning change. The development of the property will be covered by the regulatory schemes of the State of Tennessee, the County of Hamilton and the Town of Walden as would be applicable to any development site.

There are in excess of 168,000 gas stations throughout the United States, and there is a significant number of gas stations in East Tennessee which has significant coal deposits and former coal mines. The underground storage tank regulatory scheme takes into account all of those concerns and has done an outstanding job at protecting the public interest with the regulatory scheme for underground storage tanks.

Attached hereto as Exhibit 2 is that certain letter dated September 6, 2019 from ECS Southeast, LLP concerning mining activity at 1823 Taft Highway. This letter from a licensed geotechnical engineer, Robert H. Barnes, P.E., P.G., Geotechnical Principal Engineer of ECS Southeast, LLP, provides the opinion that the development that occurs on this property is appropriate. Also, you will see in this letter that ECS has reviewed information relating to the property and whether there are any mines located on the property.

Respectfully, we would request that the Board not take any further action or consider any further action on this dubious and spurious claim asserted by Mr. Wheeler who, again, has no credentials to support this claim. Again, LOP, LLC respectfully indicates there is no credence to the alleged concern raised by Mr. Wheeler, that the only basis for it is to try to stop a development in which he opposes, and that his interest is not public safety, but personal.

John Anderson

From: Trevor Martin <Trevor.Martin@tn.gov>
Sent: Friday, September 6, 2019 4:47 PM
To: John Anderson
Cc: Bryan Epperson
Subject: RE: Timesville mining
Attachments: We sent you safe versions of your files; Timesville area.jpg; Timesville area w deep mine locations.pdf

One more map of the area I thought you might find interesting is the attached bare-earth Digital Elevation Model (DEM) of the Timesville area. This shows the ground surface in the area with the trees and any structures removed, and several old deep mine entries can be seen. The second file is the same map, but I have circled some (but not all) of the old deep mine entries.

Hope this is helpful. Have a good weekend,
Trevor

From: Trevor Martin
Sent: Friday, September 06, 2019 10:19 AM
To: John Anderson
Cc: Bryan Epperson
Subject: RE: Timesville mining

Good morning, John –

I appreciate the invitation, but I will not be available to attend the hearing. Please feel free to direct any questions related to mining activity in the area to me.

Thanks,
Trevor

TN Department of Environment & Conservation

Trevor Martin | AML Program Manager
Division of Water Resources
Land Reclamation Section
3711 Middlebrook Pike, Knoxville, TN 37921
p. 865-594-5603 c. 865-207-8995
trevor.martin@tn.gov
tn.gov/environment

We value your feedback! Please complete our customer satisfaction survey.

From: John Anderson [mailto:janderson@gkhpc.com]
Sent: Thursday, September 05, 2019 3:22 PM

EXHIBIT tabbies 1

To: Trevor Martin
Subject: [EXTERNAL] RE: Timesville mining

Trevor,
This information is extremely helpful. The Town of Walden public hearing for rezoning the property we own at 1823 Taft Hwy (US 127) is Tuesday Sept 10 at 6:30 at Bachman Community Center in the Town of Walden. I would appreciate if you can attend this meeting to clarify the record. Mr. Anthony Wheeler continues to disseminate information that is contrary to the public records both about mining activity on our property as well as portraying development as hazardous. I am glad to pay any travel expenses including overnight expense if required.
Thanks,

John R. Anderson
Grant, Konvalinka & Harrison, P. C.
633 Chestnut Street
900 Republic Centre
Chattanooga, TN 37450
423/756-8400
janderson@gkhpc.com

From: Trevor Martin <Trevor.Martin@tn.gov>
Sent: Friday, August 23, 2019 5:09 PM
To: John Anderson <janderson@gkhpc.com>
Subject: Timesville mining

Mr. Anderson,

Our office has received several inquiries about this proposed development from many different people. Below is an email response from Barry Miller, a geologist in our office, to a local resident who contacted him. Barry's email and the attachments do good job of explaining the mining history of the area. While there has certainly been mining in the vicinity, we have no records of mining activity under this particular property. There may have been mining activity we are unaware of, but I could not find any documentation or evidence of it using LiDAR data.

From Barry's email:

"All of the information here was obtained from the Fairmount Quadrangle Geologic Map. The property (green star) is located near the contact between the lower shale member of the Vandever Formation (Pvl) above and the Newton Sandstone (Pn) below. The Newton Sandstone is described as being about 60 to 130 feet in thickness. The Newton Sandstone is underlain by the Whitwell Shale (Pw). The Whitwell Shale contains two coals, the upper coal is the Sewanee seam and the lower coal is the Richland seam. Most of the mining in the area has taken place in the Sewanee seam although the Richland has a few small mines. The Sewanee seam lies about 70 to 90 feet below the property with the Newton Sandstone in-between. According to the Fairmount coal maps, there are no underground mines below the property and the property is located at the edge of the 28 inch Sewanee coal reserve boundary. Some Sewanee seam underground mines lie to the west, northwest, and southwest of the property and the closest extent of these mines lie

approximately 1000 feet away. The rock strata in the area dip toward the northwest with the Sewanee seam outcropping to the east at an elevation of approximately 1950 feet and outcropping to the west at an elevation of approximately 1800 feet."

Hope this information is helpful,
Trevor

Trevor Martin | AML Program Manager
Division of Water Resources
Land Reclamation Section
3711 Middlebrook Pike, Knoxville, TN 37921
p. 865-594-5603 c. 865-207-8995
trevor.martin@tn.gov
tn.gov/environment

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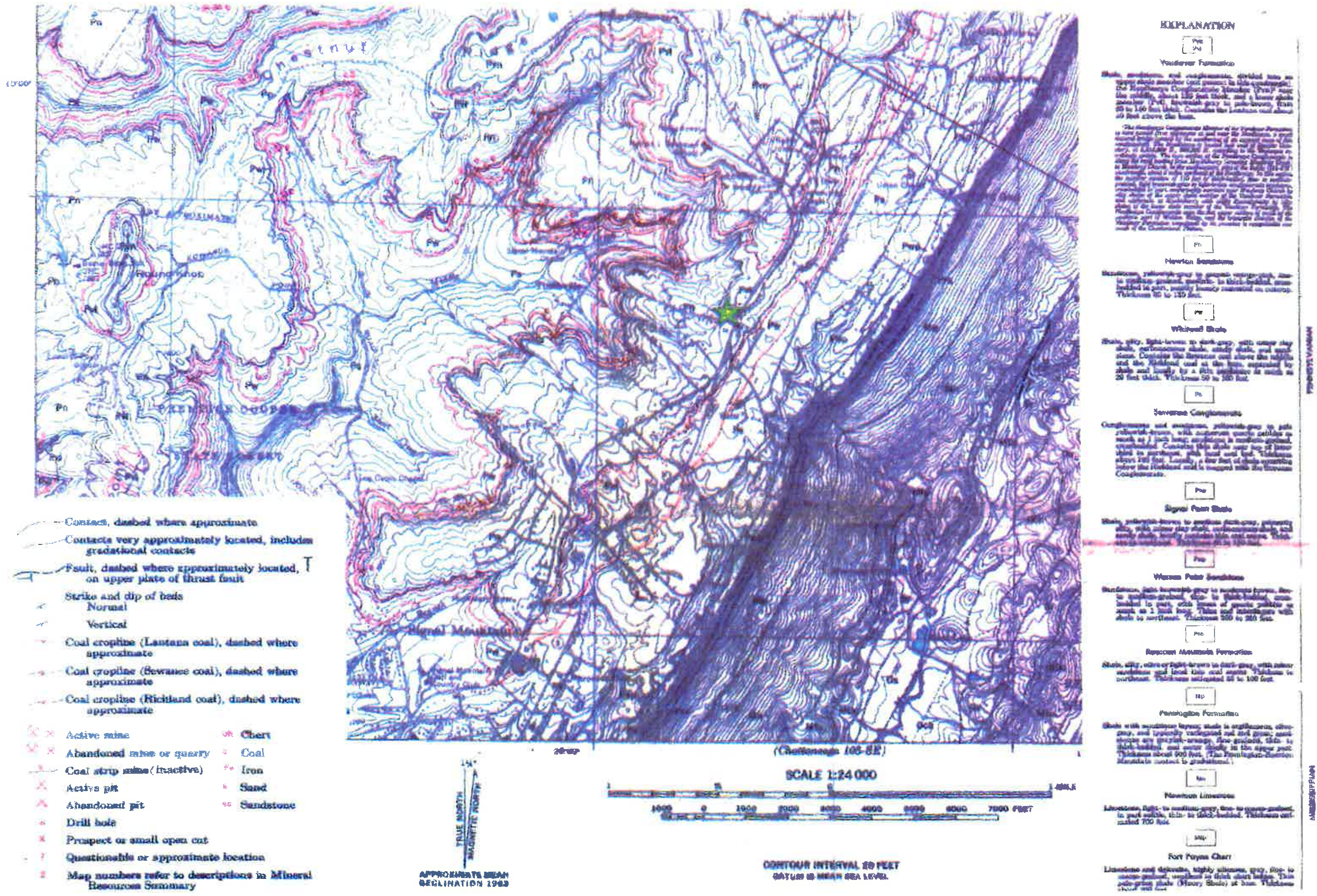
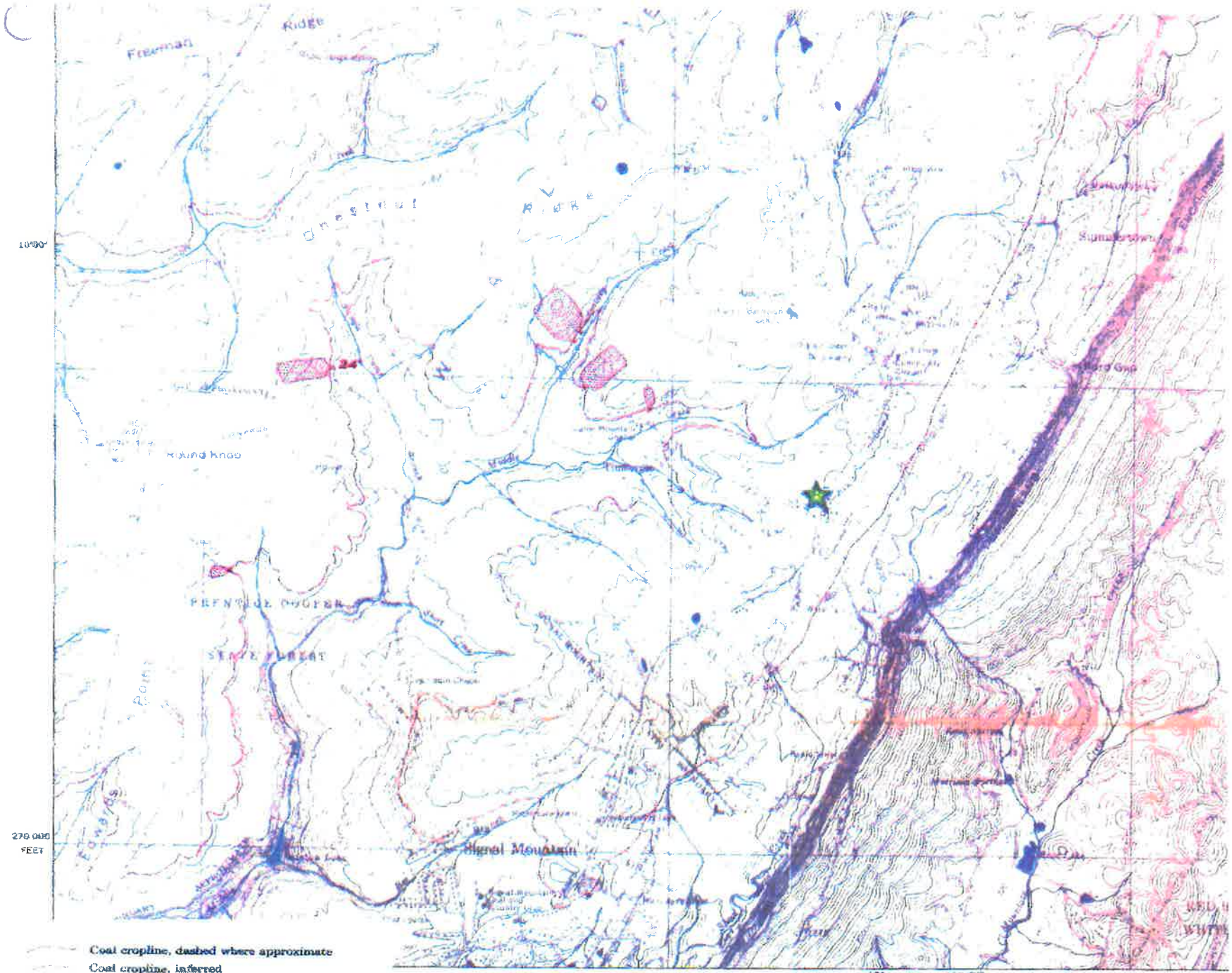
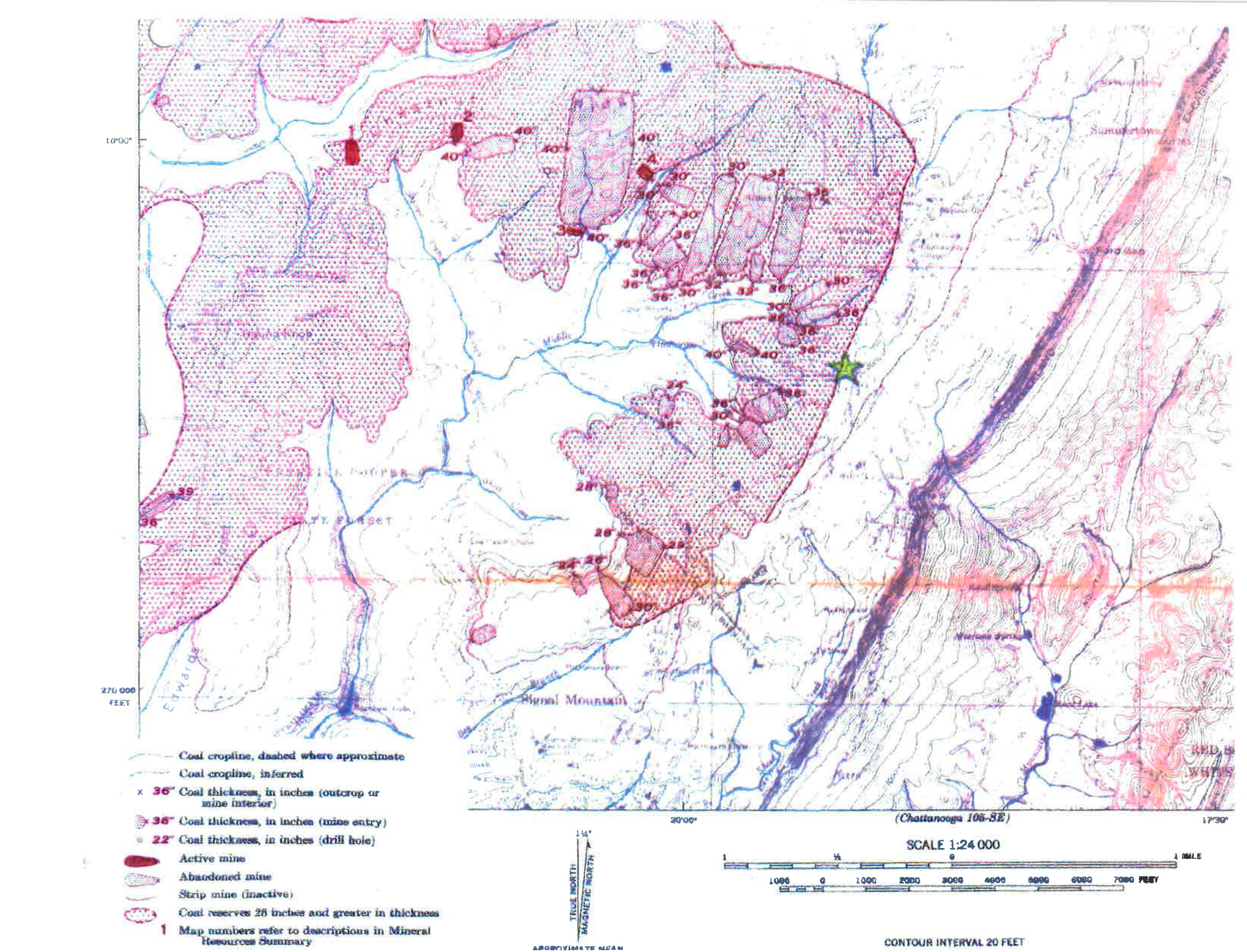

EXPLANATION
Vandever Formation
Newton Sandstone
Whitwell Shale
Sewanee Conglomerate
Signal Point Shale
Warren Point Sandstone
Raccoon Mountain Formation
Pennington Formation
Newman Limestone
Fort Payne Chert
PENNSYLVANIAN
MISSISSIPPIAN
Contacts, dashed where approximate
Contacts very approximately located, includes gradational contacts
Fault, dashed where approximately located, T on upper plate of thrust fault
Strike and dip of beds
Normal
Vertical
Coal cropline (Lantana coal), dashed where approximate
Coal cropline (Sewanee coal), dashed where approximate
Coal cropline (Richland coal), dashed where approximate
Active mine
Abandoned mine or quarry
Coal strip mine (inactive)
Active pit
Abandoned pit
Drill hole
Prospect or small open cut
Questionable or approximate location
Map numbers refer to descriptions in Mineral Resources Summary
Chert
Coal
Iron
Sand
Sandstone
Signal Mountain
(Chattanooga 105-SE)
SCALE 1:24 000
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION 1963

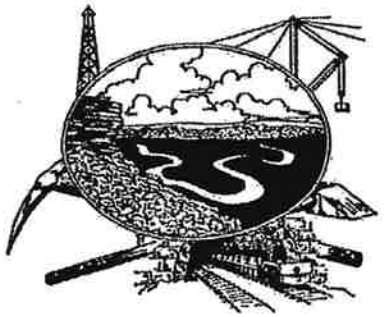

Freeman Ridge
Chestnut
Round Knob
Signal Mountain
10'00"
17'30"
20'00"
270 000 FEET
(Chattanooga 105-SE)
39" Coal thickness, in inches (outcrop)
28" Coal thickness, in inches (mine entry)
24" Coal thickness, in inches (drill hole)
Coal cropline, dashed where approximate
Coal cropline, inferred
Abandoned mine
Strip mine (inactive)
Coal reserves 28 inches and greater in thickness
TRUE NORTH
MAGNETIC NORTH
SCALE 1:24 000
1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
CONTOUR INTERVAL 20 FEET


Coal cropline, dashed where approximate
Coal cropline, inferred
36" Coal thickness, in inches (outcrop or mine interior)
36" Coal thickness, in inches (mine entry)
22" Coal thickness, in inches (drill hole)
Active mine
Abandoned mine
Strip mine (inactive)
Coal reserves 26 inches and greater in thickness
1 Map numbers refer to descriptions in Mineral Resources Summary
Signal Mountain
Summertown
(Chattanooga 10S-SE)
SCALE 1:24 000
1 MILE
1000 FEET
TRUE NORTH
MAGNETIC NORTH
CONTOUR INTERVAL 20 FEET

STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY

MINERAL RESOURCES SUMMARY OF THE FAIRMOUNT QUADRANGLE, TENNESSEE

By
EDWARD T. LUTHER
and
GEORGE D. SWINGLE



NASHVILLE, TENNESSEE
1963

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MINERAL RESOURCES SUMMARY OF THE FAIRMOUNT QUADRANGLE, TENNESSEE

By

EDWARD T. LUTHER [1] and GEORGE D. SWINGLE [2]

INTRODUCTION

This mineral resources summary accompanies the geologic map of the Fairmount quadrangle, which is bounded by 35°07'30" and 35°15' N. Latitude and by 85°15' and 85°22'30" W. Longitude, an area in western Hamilton and southeastern Sequatchie Counties.

The known mined mineral resources of this quadrangle are coal, sand, and dimension sandstone. Potential resources are chert, iron, limestone and dolomite, shale, and clay.

Mines, quarries, pits, prospects, and drill holes have been located with reference to the Tennessee Coordinate System. The base point for this system (at the intersection of 86°00' W. Longitude and 34°40' N. Latitude near Scottsboro, Alabama) is assigned the values 2,000,000 feet east and 100,000 feet north. The coordinate

[1] Assistant State Geologist, Tennessee Division of Geology, Nashville
[2] Associate Professor of Geology, University of Tennessee, Knoxville.

ation (in feet) of any point in Tennessee may be expressed with ference to its distance east-west and north of this base point. This stem is shown in gray on the quadrangle map as a grid of 10,000-ot rectangles. All locations on this map may be measured from the ference coordinates shown along the margins of the quadrangle.

COAL

The first coal mining in Hamilton County was in 1842, at Sale eek, about 12 miles northeast of the border of the Fairmount adrangle. It is not known definitely when mining began in the irmount quadrangle, but it probably was not until after the vil War.

Coal mining once was very important in the Fairmount quad-ngle, as evidenced by more than 40 abandoned mines or prospects, t at present the industry has dwindled to 4 small active mines able 1). Most of the mines are concentrated around the head-ters of Middle Creek southwest of Fairmount, and around the ain northwestward-trending ridge just east of Hicks Branch, out 2½ miles north-northeast of Fairmount.

Most of these mines are small, employ only a few men, and rk only a few acres of coal. The largest single operation, no ger active, has a mined-out area of about 100 acres, and the al mined-out area in the quadrangle is approximately 420 acres. re than 2 million tons of coal are estimated to have been mined lost in mining in the quadrangle.

Geology of the Coal Seams

The coal-bearing rocks of the Fairmount quadrangle are of Penn-vanian age and are restricted to Walden Ridge, a northeastward-nding syncline that occupies the western three-fourths of the adrangle. Most of the mining areas are located near the axis of syncline, where the beds are nearly flat or dip gently to the itheast, but two abandoned mines are located near the eastern e of the syncline at Pickett Gulf and Roberts Gap, where the to the northwest is appreciable.

TABLE 1. LOCATIONS OF COAL MINES IN THE FAIRMOUNT QUADRANGLE, TENNESSEE

RICHLAND SEAM

Map Number	*Tennessee Coordinates*	*Mine Names*
----	275,700N., 2,190,500E.	Inactive mine, name unknown
----	280,000N., 2,192,600E.	Hawkins Mine (inactive)
----	281,100N., 2,192,500E.	Inactive mine, name unknown
----	280,600N., 2,197,200E.	Inactive strip mine, name unknown
----	280,700N., 2,197,800E.	Inactive mine, name unknown
----	281,100N., 2,198,000E.	Inactive mine, name unknown
----	279,800N., 2,198,000E.	Inactive mine, name unknown
----	279,400N., 2,199,500E.	Inactive mine, name unknown
----	277,400N., 2,198,700E.	Lloyd Little Strip Mine (inactive)
----	304,300N., 2,205,500E.	Wilson Mine (inactive)

SEWANEE SEAM

----	292,300N., 2,187,100E.	Inactive mine, name unknown
----	292,000N., 2,187,100E.	Inactive mine, name unknown
----	292,000N., 2,187,400E.	Inactive mine, name unknown
----	283,400N., 2,187,200E.	Inactive mine, name unknown
----	284,700N., 2,194,500E.	Inactive strip mine, name unknown
----	284,800N., 2,194,800E.	Inactive mine, name unknown
1	282,600N., 2,191,600E.	Active mine (1962), name unknown
----	274,200N., 2,187,000E.	Inactive mine, name unknown
2	282,600N., 2,194,000E.	Doc Spangle Mine (active, 1962)
----	282,900N., 2,194,300E.	Roberts Mine (inactive)
----	279,900N., 2,196,600E.	Inactive strip mine, name unknown
3	280,600N., 2,196,900E.	Tate Mine (active, 1962)
----	280,800N., 2,197,000E.	Whitlow Mine (inactive)
----	280,800N., 2,197,800E.	Grayson Mine (inactive)
4	281,900N., 2,198,600E.	Dill Mine (active, 1962)
----	281,700N., 2,198,700E.	Kilgore # 1 Mine (inactive)
----	281,100N., 2,198,500E.	Inactive mine, name unknown
----	280,400N., 2,198,400E.	Inactive mine, name unknown
----	280,000N., 2,198,300E.	Corbin Strip Mine (inactive)
----	279,900N., 2,198,700E.	Spangler Mine (inactive)
----	279,400N., 2,199,100E.	Inactive mine, name unknown
----	279,500N., 2,199,500E.	Vandergriff #2 Mine (inactive)
----	279,700N., 2,200,200E.	Kilgore #2 Mine (inactive)
----	279,600N., 2,200,900E.	Inactive mine, name unknown
----	279,700N., 2,201,500E.	Scott Mine (inactive)

TABLE 1. LOCATIONS OF COAL MINES IN THE FAIRMOUNT QUADRANGLE, TENNESSEE (Cont'd.)

SEWANEE SEAM

Map Number	*Tennessee Coordinates*	*Mine Names*
-----	279,000N., 2,201,800E.	Vandergriff #1 Mine (inactive)
-----	278,600N., 2,202,000E.	Grover Louis #2 Mine (inactive)
-----	278,600N., 2,201,800E.	Inactive mine, name unknown
-----	278,100N., 2,200,400E.	Richard Louis #8 Mine (inactive)
-----	276,600N., 2,200,800E.	Inactive mine, name unknown
-----	276,400N., 2,200,700E.	Murray Mine (inactive)
-----	276,300N., 2,220,300E.	Dave Frizzell Mine (inactive)
-----	276,900N., 2,199,000E.	Bollinger Mine (inactive)
-----	275,000N., 2,197,600E.	Little Mine (inactive)
-----	273,800N., 2,197,900E.	Johnson Mine (inactive)
-----	272,900N., 2,197,300E.	Mathis Mine (inactive)
-----	272,800N., 2,196,900E.	Higdon Mine (inactive)
-----	271,400N., 2,194,500E.	Inactive mine, name unknown
-----	294,700N., 2,210,100E.	Inactive mine, name unknown
-----	293,900N., 2,210,400E.	Inactive strip mine, name unknown
-----	301,500N., 2,218,700E.	Luan Mine (inactive)
-----	301,900N., 2,219,400E.	Inactive mine, name unknown

LANTANA SEAM

-----	299,300N., 2,207,000E.	Inactive mine, name unknown
-----	299,700N., 2,206,600E.	Hicks Mine (inactive)
-----	301,400N., 2,207,200E.	Serodino Strip Mine (inactive)
-----	300,700N., 2,207,800E.	Inactive mine, name unknown
-----	300,500N., 2,207,700E.	Inactive mine, name unknown
-----	300,100N., 2,208,400E.	Blockton Coal Co. Mine (inactive)
-----	300,200N., 2,208,800E.	Inactive mine, name unknown
-----	300,600N., 2,208,500E.	Inactive mine, name unknown
-----	300,900N., 2,208,500E.	Inactive mine, name unknown
-----	302,400N., 2,208,300E.	Serodino Strip Mine (inactive)

The three important seams in the Fairmount quadrangle are ıe Richland, Sewanee, and Lantana coals, which are in the Crab rchard Mountains Group of the lower Pottsville Series. Of these ıe Sewanee coal is by far the most important, both from the stand-ɔint of past and present mining and of known reserves.

In this quadrangle wherever the horizons of the Richland and Sewanee coals have been tested some coal has been found, though not necessarily of minable thickness. These coals may be considered as blanket deposits. The Lantana coal, on the other hand, is pockety in occurrence and is known to be absent over considerable areas. The thickest body of Lantana coal is quite restricted in area and abruptly thins laterally.

Richland coal.—This seam (also called the No. 9) is near the base of the Whitwell Shale, only a few feet above the underlying Sewanee Conglomerate and separated from it by a thin underclay and a few feet of sandy to silty shale. Above the coal is shale of variable thickness succeeded, in some areas, by thin sandstone. The Richland coal is known to range in thickness from 17 to 39 inches in this quadrangle.

Sewanee coal.—The Sewanee coal (or No. 10 seam) is found in the middle to upper part of the Whitwell Shale. This coal is underlain by underclay and shale and overlain by shale as much as 40 feet thick, which in turn is overlain by the Newton Sandstone. The Sewanee coal ranges in thickness from 0 to 60 inches in the Fairmount quadrangle.

Lantana coal.—In most places, the Lantana is about 40 feet above the base of the lower shale member of the Vandever Formation. It is underlain by underclay and shale and is overlain by shale and fine-grained sandstone 20 to 80 feet thick, which in turn are overlain by the Needleseye Conglomerate Member of the Vandever Formation. In some areas a thin (unnamed) coal is present about 20 feet beneath the Lantana. The Lantana coal ranges in thickness from 0 to 30 inches in the Fairmount quadrangle.

Mining

All the active operations are small underground mines. These employ only a few men each, who work mostly by hand labor and use mules to haul the coal to the surface. None of the coal is beneficiated by crushing or washing.

Because of the general thickness and character of the overburden and the moderately steep slopes above the coal seams, strip mining is feasible only along the contour or outcrop in relatively narrow belts.

Coals found in the Fairmount quadrangle are high-volatile bituminous coals, with fixed carbon less than 69 percent and heating value from 12,000 to 14,000 BTU per pound. These are considered to be coking coals, though not all can be made into metallurgical-grade coke. The coals of the Fairmount quadrangle are suited to a variety of industrial and domestic uses and can be considered to be good coals. Proximate and ultimate analyses of the Richland, Sewanee, and Lantana coals for Hamilton County, which should be fairly typical of the coal in these seams in the Fairmount quadrangle, are shown in table 2.

None of the coal mined at present in the Fairmount quadrangle is cleaned or otherwise mechanically prepared, because the uses to which it is put do not require this. Washability tests made by the U. S. Bureau of Mines on Sewanee coal from a mine in this quadrangle indicate that the coal cannot be upgraded economically by washing to meet the specifications for making metallurgical coke.

Reserves

Table 3 shows a total of 14,024,000 tons of estimated reserves of recoverable coal in this quadrangle; tonnage figures are given by seam and are subdivided into measured, indicated, and inferred reserves. As used in estimating reserves in this quadrangle, measured reserves are those within ¼ mile of a mine opening, facing, drill hole, or other information point, indicated reserves are within ½ mile of such points, and inferred reserves are within 1 mile, where geological information indicates that the coal beds are continuous and either uniform in thickness or predictably variable.

Recoverable reserves are considered to be only coal in beds more than 28 inches thick (because beds thinner than this at the present time cannot be mined underground economically), and are calculated as 50 percent of the total coal actually in the ground.

Sufficient reserves of coal of minable thickness and good enough quality for steam or domestic use are known in the Fairmount quadrangle to support a coal producing industry many times larger than the present one for many years. Reserves are in three seams and are located over a wide area, so that many sites are available for the location of small to medium sized mines.

TABLE 2. REPRESENTATIVE ANALYSES OF COALS FROM HAMILTON COUNTY[1]
(maximum, minimum, and average[2] figures)

	Seam	Proximate (percent)				Ultimate (percent)					Heat value (B.t.u.)	Ash softening temp. (°F.)
		Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		
RICHLAND		3.3	31.0	60.9	16.5	2.7	----	----	----	----	14,150	2,560
		2.0	28.6	51.6	7.8	1.7	----	----	----	----	12,160	2,450
		[2]2.6	[2]29.68	[2]55.3	[2]12.95	[2]2.38	4.9	73.3	1.4	5.6	[2]12,995	[2]2,497
SEWANEE		4.0	39.3	64.5	14.9	4.3	5.3	79.4	1.5	7.1	14,310	3,010
		1.6	25.7	53.4	4.0	.7	4.6	69.9	1.3	5.0	12,400	1,980
		[2]2.79	[2]28.76	[2]59.33	[2]9.64	[2]1.78	[2]4.93	[2]75.14	[2]1.37	[2]6.09	[2]13,514	[2]2,450
LANTANA		----	----	----	----	----	----	----	----	----	----	----
		----	----	----	----	----	----	----	----	----	----	----
		2.7	28.9	53.7	14.7	1.4	----	----	----	----	12,610	2,870

[1] From Tenn. Div. Geology Bull. 63.
[2] Average figures.

RICHLAND	Hamilton	----------	2,071,000	1,651,000	3,722,000
	Total		2,071,000	1,651,000	3,722,000
SEWANEE	Sequatchie	----------	17,000	1,467,000	1,484,000
	Hamilton	2,819,000	3,780,000	2,046,000	8,645,000
	Total	2,819,000	3,797,000	3,513,000	10,129,000
LANTANA	Hamilton	173,000	----------	----------	173,000
	Total	173,000			173,000
				Total	14,024,000

Prospecting should be restricted to areas underlain by beds of Pennsylvanian shale. On the accompanying geologic map those areas labeled *Pra* (Raccoon Mountain Formation), *Psp* (Signal Point Shale), *Pw* (Whitwell Shale), and *Pvl* (lower shale member of the Vandever Formation) are underlain mostly by shale, and the lines labeled *r*, *s*, and *l* show the approximate outcrops of the Richland, Sewanee, and Lantana coals, respectively.

Selected References

HERSHEY, R. E., WILLIAMS, LLOYD, CRENTZ, W. L., AND MILLER, J. W. (1956) *Estimate of Known Recoverable Reserves and the Preparation Characteristics of Coking Coal in Hamilton County, Tenn:* U. S. Bur. Mines Rept. Inv. 5263.

LUTHER, E. T. (1959) *The Coal Reserves of Tennessee*: Tenn. Div. Geology Bull. 63.

SAND

Sand is produced on this quadrangle 1½ miles northeast of Fairmount in the north-central part of the quadrangle (Map Number—5). The Tennessee Coordinate location is 295,300N., 2,206,250E. The deposit, which has been worked since the spring of 1955, is on the property of Webster T. Bollinger and is operated by the Sawyer Sand Company. The sand occurs in the Needleseye Conglomerate Member of the Vandever Formation. At this place sandstone beds are somewhat friable because of weathering and require a minimum of crushing to liberate the individual sand grains. The sand in places is conglomeratic, containing pebble-size quartz fragments. About 1 ton of gravel is produced per 15 to 20 tons of sand. The sand is variable in grain size, ranging from fine to coarse, depending upon which bed is being quarried. Most of the sand is marketed as masonry sand.

Vast reserves of sand are present in the Pennsylvanian sandstone formations on Walden Ridge, but in most places the sandstone layers are well indurated and require crushing.

Selected Reference

HERSHEY, R. E. (1960) *The High-Silica Resources of Tennessee:* Tenn. Div. Geology Rept. Inv. 10.

SANDSTONE (Dimension)

ıdstone is not being quarried in the Fairmount quadrangle at esent time, but quarries are operating on the Ketner Gap ıngle to the west.

ere are two abandoned quarries on the Fairmount quadrangle he western border of the map. One is in Hamilton County Number—6), on the southern slope of Freeman Ridge (Ten- Coordinates 284,300N., 2,190,800E.), and is developed in the ı Sandstone. Another quarry (Map Number—7) is on the slope of Grayson Ridge, 1½ miles to the north (Tennessee ıates 292,000N., 2,190,700E.) This quarry is in the Needles- nglomerate Member of the Vandever Formation. The rock in quarries appears generally similar to that produced from the ille Sandstone in the vicinity of Crossville and Crab Orchard berland County.

Selected Reference

i. W. (1958) *The Sandstone Industry of the Crossville-Crab Orchard ict, Tennessee:* Tenn. Acad. Sci. Jour., v. 33, no. 1.

CHERT

ert is not being mined in the Fairmount quadrangle at present, o abandoned chert pits are present. The pit designated Map r—8 is located along Grubb Road, 1,500 feet east of U. S. ay 27, near the eastern border of the quadrangle (Tennessee ıates 283,250N., 2,223,300E.); the other pit (Map Number located on the northern outskirts of Red Bank, 2,000 feet U. S. Highway 27 (Tennessee Coordinates 273,450 N., 2,218,-

ge reserves of chert are present in the southeastern portion quadrangle, in rocks of the Knox Group. Prolonged weather- his area has resulted in the accumulation of a thick residuum ng the Knox. Consequently, almost any hill in the Knox out- lt is a potential pit site. The estimated thickness of the Knox ım averages 50 feet or more, and thicknesses of more than t are not uncommon. The chert is mixed with yellowish to r that is relatively impermeable. Chert in this area is widely road fill and as surfacing material.

Another source of chert in this area is the weathered portion of the Fort Payne Chert, which crops out in two belts paralleling the Cumberland Escarpment in the southeastern part of the quadrangle. The chert in the Fort Payne generally is similar to that in the Knox.

IRON (Hematite)

Thin layers and lenticular beds of hematite occur in the upper part of the Rockwood Formation, which is present in the south- eastern portion of the quadrangle. The ferruginous beds in the Rockwood were prospected extensively and mined locally about 1900 along the base of the Cumberland Escarpment in East Tennessee.

In the area of the Fairmount quadrangle two prospects have been described by Burchard (1913, p. 88). The exact locations of the sites described by Burchard are unknown, but Burchard's Locality No. 11 is believed to be at or near the prospect symbol indicated on the Fairmount quadrangle between Browntown and Mountain Creek roads (Map Number—10; Tennessee Coordinates 278,850N., 2,212,- 600E.). The prospect shown 1 mile to the northeast near Brown- town road (Map Number—11; Tennessee Coordinates 281,700N., 2,216,900E.) is believed to correspond to Burchard's Locality No. 12. The following description of these two localities is from Bur- chard (p. 88):

Section of "Rockwood" ore 3¼ miles northwest of Hixson (Pl. II, 11, and corresponding ore section.)

	Inches
Shale, sandy	
Ore, hard, limy	7
Limestone, argillaceous and slightly ferruginous	2-3
Limestone ferruginous	4-6
Shale	

Dip 10° to 15° S. 40° W.

On the east limb of the anticline about seven-tenths mile northeast of the point where section No. 11 was measured, considerable float ore was noted in a small stream bed. Some slabs of ore measuring seven inches in thickness were found and one ledge was found in place which measured five inches in thickness. There may be two thin ledges of ore in the shale in this locality, which is indi- cated by the point numbered 12 on the map, Pl. II.

Selected Reference

BURCHARD, E. F. (1913) *The Red Iron Ores of East Tennessee:* Tenn. Geol. Survey Bull. 16.

LIMESTONE AND DOLOMITE

ere are no active quarries on this quadrangle at present, but eserves of limestone suitable for ordinary crushed stone uses esent in the southeastern portion of the quadrangle.

e Newman Limestone, which outcrops along the base of the rland Escarpment and in a belt east of and parallel with U. S. ay 27, consists of massive, relatively pure, crystalline gray one. The Newman has not been tested in this area but is to contain as much as 95 percent calcium carbonate ($CaCO_3$) is southwest of the Fairmount quadrangle.

pure shaly limestone is present in the Chickamauga forma- the southeast part of the quadrangle. This rock generally is for ordinary crushed stone uses.

lomite is present in the Copper Ridge and younger formations Knox Group, but quarrying operations in this area would dered by the thick overburden of residuum.

Selected Reference

Y, R. E., AND MAHER, S. W. (1963) *Limestone and Dolomite Resources Tennessee*: Tenn. Div. Geology Bull. 65.

SHALE AND CLAY

veral types of shale occur in the Fairmount quadrangle but s being mined at present.

e Pennington Formation, which crops out along the Cumber- Escarpment, is quarried near Graysville and Daisy, Tennessee, e in tile industries.

e Chattanooga Shale, exposed in places in the southeastern f the quadrangle, is a low-grade oil shale and is known to con- small amount of uranium (generally less than .01%U).

veral of the Pennsylvanian shale formations are believed le for use as bloating shale, although they have not been in this area.

reclays are locally present in thin beds beneath a few of the sylvanian coal beds.

Selected References

CONLEY, J. E., WILSON, HEWITT, KLINEFELTER, T. A., AND OTHERS (1948) *Production of Light-weight Concrete Aggregates from Clays, Shales, Slates, and Other Materials*: U. S. Bur. Mines Rept. Inv. 4401.

STOCKDALE, P. B., AND KLEPSER, H. J. (1959) *The Chattanooga Shale of Tennessee as a Source of Uranium*: U. S. Atomic Energy Comm. Tech. Info. Service ORO-205.

ECS SOUTHEAST, LLP
"Setting the Standard for Service"
Geotechnical • Construction Materials • Environmental • Facilities

September 6, 2019

John R. Anderson
Grant, Konvalinka & Harrison, P. C.
633 Chestnut Street
900 Republic Centre
Chattanooga, TN 37450

Re: Mining Activity
1823 Taft Highway
Walden, Tennessee

ECS Project # 10:10131-B

Dear Mr. Anderson:

It is our understanding that there has been a question asked regarding whether or not mining activity has occurred on the above referenced site. Per your request, ECS Southeast, LLP has contacted Mr. Peter J. Lemiszki, Ph.D., Chief Geologist with the Tennessee Geological Survey requesting any mining records for the local area.

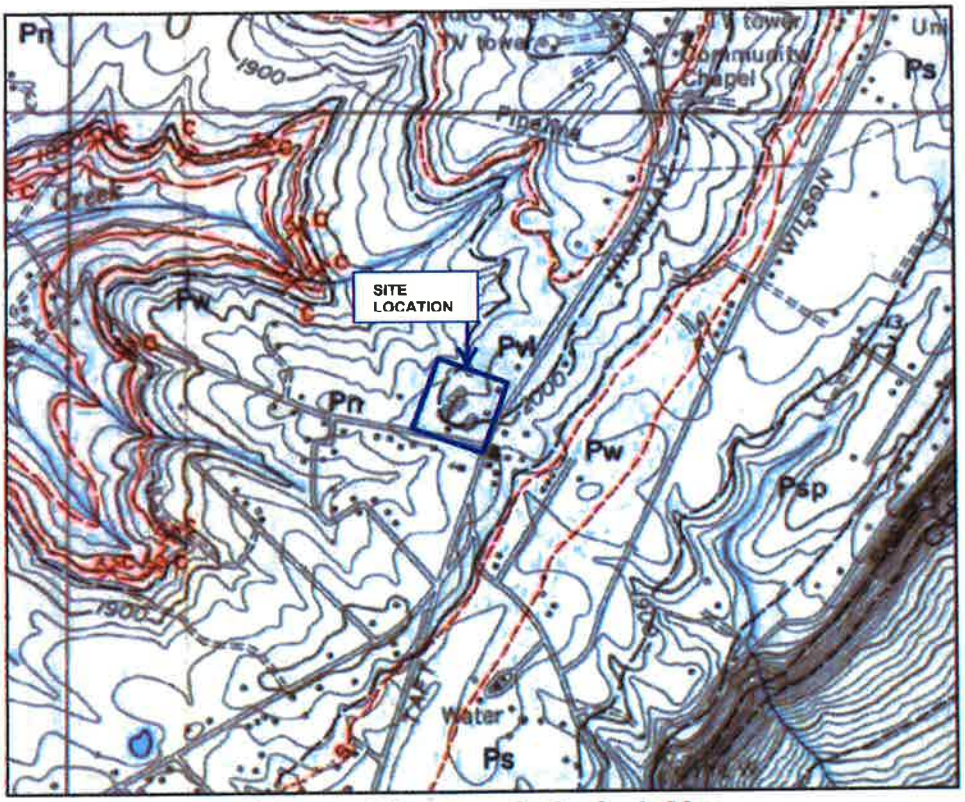
As a result of our correspondence with Mr. Lemiszki, we have been provided with the following information regarding past mining activity around the subject property. The geologic map and coal map for the area surrounding the subject property are presented in Figures 1 and 2, respectively. According to the information provided by Mr. Lemiszki, the subject property is located on the Geologic Map of the Fairmount Quadrangle (Luther and Swingle, 1963). As shown in Figure 1 the lower shale member of the Vandever Formation (Pvl) and Newton Sandstone (Pn) contact underlies the property.

Beyond the subject property limits to the west are abandoned coal mines, which may have since been reclaimed. These are shown on Figure 1. *According to the maps provided, all known mining activity was off the subject property.*

As shown on the coal map (Figure 2), the coal seam (reserve) extends beneath the subject property. The thick red dashed line through the western side of the property represents where the mapped coal seam is greater than 28 inches in thickness. At the mined locations to the west, the coal seam is indicated with a thickness of 36 inches. The coal seam thickness thins out to the east and is apparently minimal at the outcrop to the east. Beneath the subject site the coal seam is expected to be less than 36 thick, likely ranging from 24 to 30 inches in thickness.

The coal seam dips gently downward from east to west. Based on the elevation of the outcropping to the east of Taft Highway at about the 1960 feet contour and the elevation of the outcrop of the coal seam to the west of the subject property (shown as a thin dashed line where the mine entrances are located) at about 1840 ft elevation, the coal seam is estimated to be greater than 40 feet beneath the subject property which has a surface elevation of about elevation 2000.

EXHIBIT
tabbies
2



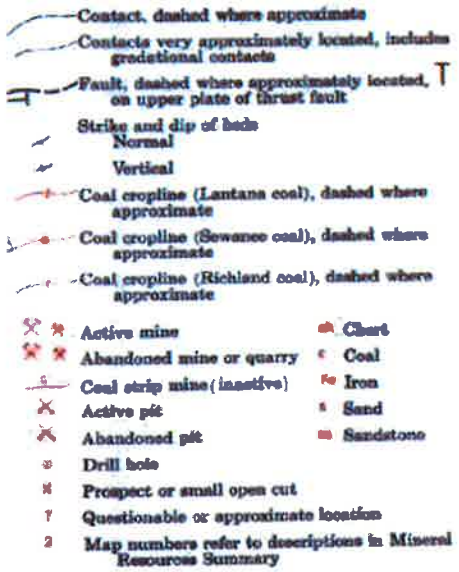
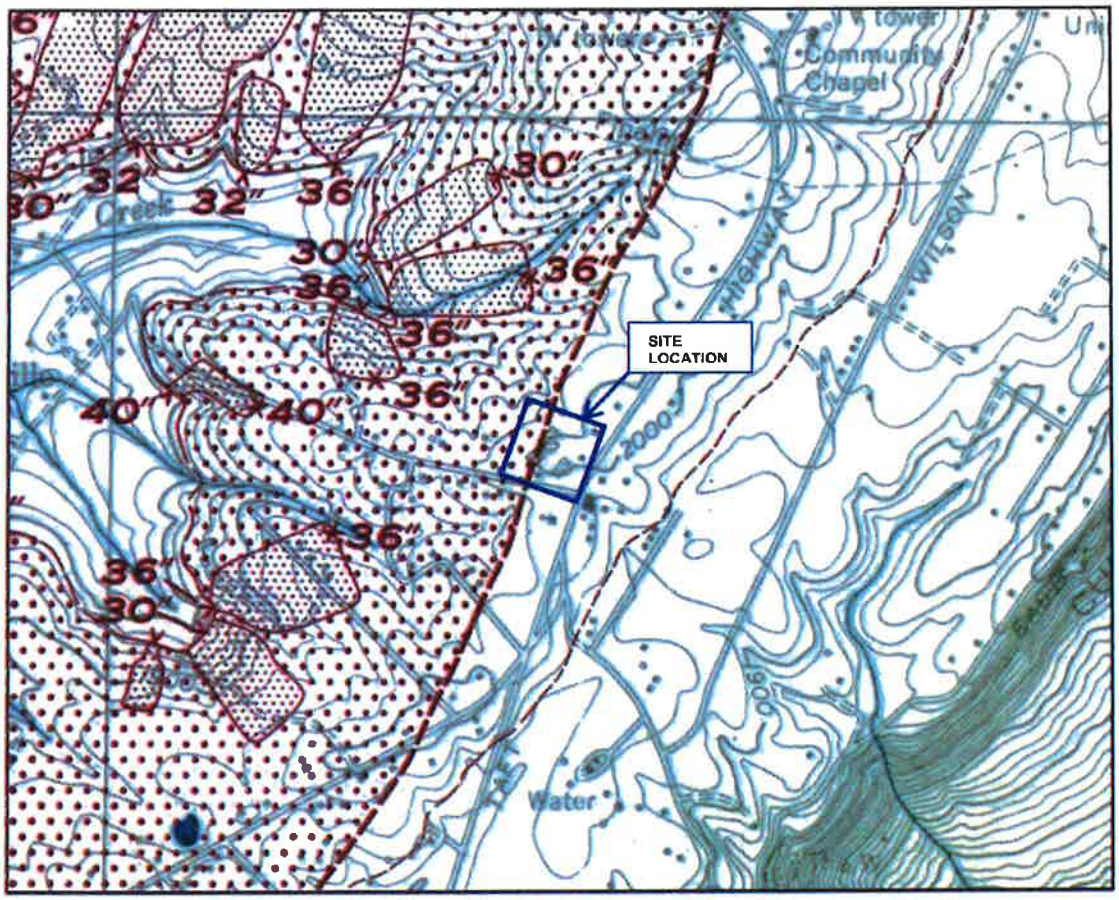


Figure 1: Fairmount Quadrangle Geologic Map (Luther and Swingle, 1963).



Fairmount Quadrangle Coal Map of the Sewanee Coal

Coal cropline, dashed where approximate
Coal cropline, inferred
x 36" Coal thickness, in inches (outcrop or mine interior)
36" Coal thickness, in inches (mine entry)
22" Coal thickness, in inches (drill hole)
Active mine
Abandoned mine
Strip mine (inactive)
Coal reserves 28 inches and greater in thickness
1 Map numbers refer to descriptions in Mineral Resources Summary

Figure 2: Fairmount Quadrangle Coal Map of the Sewanee Coal (source: Tennessee Geological Survey).

In our opinion, based on the thickness of the coal seam and its significant depth below the site surface, the presence of the coal seam does not pose a concern to conventional low-rise construction and should not impact the planned site development from a geotechnical or geologic standpoint. Furthermore, the mining data provided by Mr. Lemiszki clearly shows that mining has not occurred on the subject site.

Should you have questions regarding our findings or need additional consultation, please do not hesitate to contact our office at (770) 590-1971.

Respectfully,

ECS SOUTHEAST, LLP represented by:

Robert H. Barnes, P.E., P.G. (GA)
Geotechnical Principal Engineer

Robert L. Goehring, P.E., P.G.
Chief Engineer
TN Registration No. 104496