

**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

**In the Matter of:**

**INVESTIGATION OF KENTUCKY UTILITIES )  
COMPANY'S AND LOUISVILLE GAS & )  
ELECTRIC COMPANY'S RESPECTIVE NEED ) CASE NO. 2015-00194  
FOR AND COST OF MULTIPHASE LANDFILLS )  
AT THE TRIMBLE COUNTY AND GHENT )  
GENERATING STATIONS )**

**SUPPLEMENTAL RESPONSE OF  
KENTUCKY UTILITIES COMPANY AND  
LOUISVILLE GAS AND ELECTRIC COMPANY**

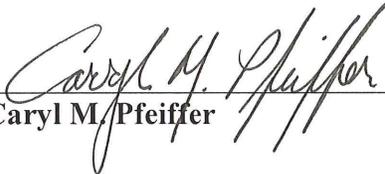
**FIRST DATA REQUEST FOR INFORMATION  
TO STERLING VENTURES, LLC  
DATED JULY 2, 2015**

**FILED: JULY 17, 2015**

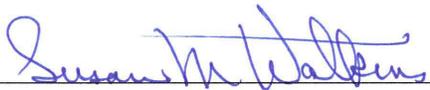
VERIFICATION

COMMONWEALTH OF KENTUCKY )  
 ) SS:  
COUNTY OF JEFFERSON )

The undersigned, **Caryl M. Pfeiffer**, being duly sworn, deposes and says that she is Director – Corporate Fuels and By-Products for LG&E and KU Services Company, and that she has personal knowledge of the matters set forth in the responses for which she is identified as the witness, and the answers contained therein are true and correct to the best of her information, knowledge and belief.

  
Caryl M. Pfeiffer

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 17<sup>th</sup> day of July 2015.

  
Notary Public (SEAL)

My Commission Expires:

~~SUSAN M. WATKINS~~  
Notary Public, State at Large, KY  
My Commission Expires Mar. 19, 2017  
Notary ID # 485723

**KENTUCKY UTILITIES COMPANY  
LOUISVILLE GAS AND ELECTRIC COMPANY**

**First Data Request for Information to Sterling Ventures, LLC**

**Dated July 2, 2015**

**Case No. 2015-00194**

**Question No. 17**

**Witness: David S. Sinclair/John N. Voyles/R. Scott Straight/Counsel**

- Q-17. The Company's original applications with the PSC for CPCN's for the Ghent and Trimble County Landfills included an Exhibit titled: *E.ON Comprehensive Strategy for Management of Coal Combustion Byproducts*, June 2009 (the "Comprehensive Strategy"). (See page 18 of Sterling's Complaint), which contained the following statement on the analysis of beneficial use opportunities (the "Opportunity Process"):

While many factors impact decisions on how to proceed (such as safety, ability to acquire needed permit(s), etc.) present value of revenue requirements is used as the primary economic decision metric. In some instances, additional cost metrics (such as cost per cubic yard or cost per ton) may also be quantified. Documentation for the evaluation is typically produced in close proximity to completing the evaluation. Often the supporting documentation is the source from which many internal and external presentations or business cases discussing the issue are developed. As previously stated, documentation regarding the alternatives is typically developed in coordination with consultants, however, the economic evaluation and associated documentation summarizing the economic evaluation is developed within E.ON U.S. At each decision point (such as formulation of alternatives, evaluation of options, development of documentation), oversight is built into the process to serve as a check. The function of this validation step is to subject the alternatives, evaluation or documentation to extensive "what ifs" and to confirm that a better alternative or solution does not possibly exist. For example, is it possible that more favorable economics could not be achieved by selecting an alternative site or location?

With respect to that statement, please answer the following:

...

- d. To the extent not included in the above request, please provide copies of all emails, correspondence, PVRR analyses, spreadsheets, documentation, internal or external presentations, business cases and any other information prepared and reviewed or discussed with respect to Sterling's 2011 proposal.

...

- i. Please provide copies of all e-mails, correspondence, economic analyses, spreadsheets, documentation, internal or external presentations, business cases and any other information prepared and reviewed or discussed with respect to the Company's decision to use gross value verses a present value or PVRR comparison in its CWA 404 Alternatives Analysis.
- j. In the MACTEC March 2012 Revised 404 Alternatives Analysis (Exhibit J of Sterling's Complaint), MACTEC states at 6-3: "The Preferred Alternative fulfills the responsibility of a publically (sic) regulated utility by the Kentucky Public Service Commission to provide the least cost alternative".

...

- v. Please provide copies of all e-mails, correspondence, gross cost, present value or PVRR analyses, spreadsheets, documentation, internal or external presentations, business cases and any other information prepared and reviewed or discussed with respect to MACTEC's statement above, and a decision, if any, to change to the gross cost comparison method used in the December 2014 Supplement to Alternatives Analysis.

A-17. **ORIGINAL RESPONSES**

- d. The information requested to be provided in Excel format is considered to be confidential and proprietary and is being filed under seal pursuant to a petition for confidential protection. Counsel for the Companies is continuing to undertake a reasonable and diligent search for other such documents and will reasonably supplement this response no later than Monday, July 20, 2015.

Certain documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Company will file no later than Monday, July 20, 2015, a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

...

- i. Counsel for the Companies has not yet found any non-privileged documents responsive to this request; however, counsel is continuing to undertake a reasonable and diligent search for other such documents and will reasonably supplement this response no later than Monday, July 20, 2015.

Certain documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which

information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Companies will file no later than Monday, July 20, 2015, a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

j. ...

v. Counsel for the Companies has not yet found any documents responsive to this request; however, counsel is continuing to undertake a reasonable and diligent search for other such documents and will reasonably supplement this response no later than Monday, July 20, 2015.

### **SUPPLEMENTAL RESPONSES**

d. See attached.

Certain documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Companies are filing contemporaneously herewith a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

...

i. All documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Companies are filing contemporaneously herewith a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

j. ...

v. No documents responsive to this request were found.

**From:** Tapp Sr., Kenny (Electric)/(O=LGE/OU=LOUISVILLE/CN=RECIPIENTS/CN=WEB/CN=TAPPK)  
**To:** Needham, Meredith  
**CC:**  
**BCC:**  
**Subject:** FW: Sterling Material Ghent Gypsum disposal  
**Sent:** 06/29/2015 06:41:39 AM -0400 (EDT)  
**Attachments:**

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Confidential and Privileged  
Attorney, Client Communication

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From: Pfeiffer, Caryl  
Sent: Thursday, October 27, 2011 9:08 AM  
To: 'John Walters'  
Cc: Tapp Sr., Kenny (Electric)  
Subject: RE: Sterling Material Ghent Gypsum disposal

John  
The assessment of disposal alternatives goes on in our Project Engineering area with support from the plants, Environmental Affairs, Legal, Fuels, etc. John Voyles, the VP of Transmission/Generation Services, has oversight of that area and can be reached at 502-627-4762. Scott Straight, the Director of Project Engineering, is responsible for coordinating that assessment and can be reached at 502-627-2701.  
Caryl

---

From: John Walters [<mailto:johnwalters@sterlingventures.com>]  
Sent: Wednesday, October 26, 2011 11:38 AM  
To: Pfeiffer, Caryl  
Subject: Sterling Material Ghent Gypsum disposal

Caryl:

I know you have been on vacation for a couple of weeks, and your desk is probably overflowing. However, I would like to find out about who I should be talking to about the proposal for gypsum disposal at Ghent that I sent by email on September 19<sup>th</sup>.

I talked to Mike Dotson a couple of weeks ago, and he told me that disposal alternatives to the new proposed CCP landfill was not something your department handled. Has this been forwarded to another department? If so, who should I be contacting?

Any help would be appreciated.

Thanks.

John

John W. Walters, Jr.  
Sterling Ventures, LLC  
376 South Broadway  
Lexington, KY 40508  
Phone (859) 259-9600  
Cell (859) 621-3990  
Fax (859) 259-9601

[johnwalters@sterlingventures.com](mailto:johnwalters@sterlingventures.com)

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please notify us immediately by phone (859) 259-9600 and arrange for the destruction or return of this transmission to us.

**From:** Pfeiffer, Caryl(/O=LGE/OU=LOUISVILLE/CN=RECIPIENTS/CN=E012383)  
**To:** Smith, Timothy (Fuels); Joyce, Jeff; Tapp Sr., Kenny (Electric); Gilbert, Bill G.; Dotson, Mike; Puckett, Paul  
**CC:**  
**BCC:**  
**Subject:** RE: Ghent Gypsum Disposal  
**Sent:** 09/19/2011 01:41:04 PM -0400 (EDT)  
**Attachments:**

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Are we going to get a meeting or conference call together to discuss this?

---

From: John Walters [mailto:[johnwalters@sterlingventures.com](mailto:johnwalters@sterlingventures.com)]  
Sent: Tuesday, September 13, 2011 5:15 PM  
To: Smith, Timothy; Joyce, Jeff; Pfeiffer, Caryl; Tapp Sr., Kenny (Electric); Gilbert, Bill G.; Dotson, Mike; Puckett, Paul  
Cc: Alex Boone  
Subject: Ghent Gypsum Disposal

Please see attached

John W. Walters, Jr.  
Sterling Ventures, LLC  
376 South Broadway  
Lexington, KY 40508  
Phone (859) 259-9600  
Cell 859-621-3990  
Fax (859) 259-9601

[johnwalters@sterlingventures.com](mailto:johnwalters@sterlingventures.com)

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**From:** John Walters(johnwalters@sterlingventures.com)  
**To:** Joyce, Jeff; Pfeiffer, Caryl  
**CC:** Alex Boone  
**BCC:**  
**Subject:** Sterling Ventures Gypsum Proposal  
**Sent:** 01/19/2012 02:49:01 PM -0500 (EST)  
**Attachments:** Exhibit 1.pdf; Exhibit 2.pdf; Exhibit 3.pdf; Exhibit 4.pdf;

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Jeff

I understand from Scott Straight that you are now in charge of doing the PVRR comparative analysis of Sterling's proposal to use the new landfill at Ghent for ash only, with gypsum disposal at our underground mine. Attached is our effort at a PVRR comparative analysis of all gypsum going to Sterling, verses into your new landfill. We based our comparative PVRR analysis on the projected O&M and capital cost for the landfill that KU filed with the PSC in 2009, and confirmed in 2011.

Attached Exhibit 1 is a general summary of our proposal, as well as the assumptions used in the PVRR analysis of that proposal. Exhibits 2 and 3 are PVRR analyses under two separate scenarios. The first, Exhibit 2, is a straight PVRR comparison to the landfill, as detailed in the 2009 filings with the PSC, versus using our underground limestone mine for gypsum beneficial reuse disposal. In this scenario, our proposal is the least cost alternative by \$260,498,235.00 (PVRR least cost alternative by \$86,599,008.00).

Exhibit 3 is a PVRR comparison assuming KU purchases scrubber limestone from Sterling, which is then backhauled to Ghent. Here, our proposal is the least cost alternative by \$342,795,003.00 (PVRR least cost alternative by \$109,405,671.00). In both PVRR analyses, \$222,368,117.00 of the saving comes from a reduction in Return on Equity from reduced capital costs. As you will see, Exhibit 3 assumes a delivered scrubber stone price of \$8.50 (\$7.00 stone with \$1.50 trucking allocation out of the \$4.50 round trip gypsum trucking), which based on documents filed with the PSC, should approximate the delivered cost of scrubber stone from Mulzer.

Exhibit 4 is the PVRR comparative analysis from Exhibits 2 and 3 in the table format that Charles Schram identified that you would use in your PVRR analysis of beneficial reuse opportunities.

I also understand from documents KU filed with the PSC that the landfill's CCP transport system cost may be significantly over the original projection, and that the projected capital cost of Phase I has increased from \$204,000,000 to \$283,000,000. Please note that the increase in the cost of Phase I has not been included in our PVRR analysis, and therefore the savings from our proposal may increase as a result of the additional capital required for Phase I.

As you can see from our projections, in addition to O&M cost savings, you can delay Phase II of the Ghent Landfill project by eleven years, and completely eliminate Phase III. You can also avoid purchasing gypsum handling equipment. However, these savings assume that all gypsum is beneficially reused at Sterling's underground mine starting with the opening of Phase I in 2013.

In Scott Straight's email to me indicating that you are now in charge of the PVRR comparative analysis, he stated that Sterling's proposal "could have merit in a few years to defer the next phased expansion of the landfill", but that "[t]he next phase of the landfill is years away...." I must admit that I am confused by Scott's conclusion. It would appear that if the ability to avoid placing gypsum in the Ghent landfill "could have merit in a few years," it also possibly has merit today. Our permit for your gypsum is approved and in place.

As indicated above, failing to take advantage of the Sterling opportunity in 2013 when the landfill opens would result in the unnecessary purchase of gypsum related equipment, and the placement of approximately 850,000 cubic yards per year of gypsum into the landfill, thereby reducing its life. The projected savings from our proposal between 2012 and 2019 (the projected opening of Phase II) is \$41,900,000.00, without backhauling limestone, and \$54,941,000.00 if you take advantage of the limestone backhaul option.

If you anticipate opening the landfill in 2013, planning needs to begin immediately if you are going to take advantage of our beneficial reuse opportunity. We need to address numerous details and logistics, as well as negotiate a contract. In addition, as indicated

above, the greatest saving potential for you occurs when you purchase hi-calcium scrubber limestone from Sterling. My understanding from documents filed with the PSC, the existing contract with Mulzer Crushed Stone for Ghent's scrubber limestone is a 9-year contract ending late 2014, with an "opt-out" provision in 2012. I also understand KU's normal practice is to enter into long terms contracts for scrubber stone. If you want to take full advantage of the potential savings, we would also need to negotiate a contract for limestone.

There are obviously numerous details we need to discuss in order for you to complete your own PVRR analysis of our proposal. Could you please let me know within the next couple of days if you are planning to do your PVRR analysis now, or as Scott indicated, you will be delaying that analysis for a few years?

Thank you for your consideration. I look forward to hearing from you.

John

John W. Walters, Jr.  
Sterling Ventures, LLC  
376 South Broadway  
Lexington, KY 40508  
Phone (859) 259-9600  
Cell (859) 621-3990  
Fax (859) 259-9601

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## GHENT STATION ALTERNATIVE FOR CCP/GYPSUM DISPOSAL

### Background

Sterling Materials is an active underground limestone mine located in Verona, Kentucky, approximately 20 miles from Kentucky Utilities Company's Ghent Station. Sterling currently mines between 1,000,000 and 1,600,000 tons of limestone per year, and has been in operation since 2000.

In addition to producing limestone for the general aggregate construction market, Sterling also mines high calcium limestone for Mississippi Lime Company for use in Mississippi Lime's kiln located on Sterling's property. This high calcium limestone is also suitable for use as scrubber stone in Ghent's limestone FGD scrubber system.

In November 2010, Sterling obtained a Beneficial Reuse Special Waste Permit from the Kentucky Department of Environmental Protection, Division of Waste Management specifically allowing the beneficial reuse of Ghent's FGD gypsum in Sterling's mine.

KU has proposed building a new landfill at Ghent in three phases for an estimated total cost of \$360,000,000 to handle the plant's three coal combustion by-products ("CCPs") through 2037<sup>1</sup>. KU forecasted the following wet storage CCP production volumes for Ghent Station (Cubic Yards):

Year	Fly Ash	Bottom Ash	Gypsum
2009	540,000	140,000	880,000
2010	550,000	150,000	1,090,000
2011	580,000	150,000	1,120,000
2012	550,000	150,000	1,060,000
2013	550,000	150,000	1,090,000

*Source: Coal Combustion Byproduct Plan for Ghent Station  
June 2009 (the "Ghent CCP Plan", page 7)*

Ghent's FGD gypsum is currently placed in a wet gypsum stacking pond. Ghent also has a contract to supply CertainTeed, Inc. with gypsum, and KU has estimated that CertainTeed will purchase approximately 222,000 cubic yards per year of gypsum from Ghent. As a result, Ghent will be required to continue diverting a portion of its gypsum production to the gypsum stacking pond.

### Alternative Proposal for Gypsum Disposal at Sterling Materials' Mine

Sterling Materials is proposing that Ghent send all of its gypsum production (net of sales CertainTeed) to Sterling's mine for beneficial reuse, with Ghent's with the new landfill being used for ash disposal only. Sterling estimates that the PVRR cost saving from the beneficial reuse of Ghent's gypsum is at least \$80,000,000. The substantial savings are generated from the ability to significantly delay the construction of phase 2 of the landfill, completely eliminate phase 3, and eliminate gypsum related

<sup>1</sup> Phase I cost thru 2018 of \$203,969,979 as set forth in Revenue Requirement Summary for Project 30 – Ghent Landfill Phase I attached. Total project capital cost estimated to be \$360,000,000 per direct testimony of John Voyles before the Kentucky Public Service Commission in Case No. 2009-00197.

capital cost and expenses associated with the landfill (all gypsum continue to be placed in stacking pond for transfer to CertainTeed and Sterling Materials).

Sterling is not proposing that the Ghent landfill not be built, but rather that KU take advantage of Sterling's Beneficial Reuse Permit so that the life of the landfill can be extended, and capital and operating cost be eliminated, by diverting the gypsum that would have been placed in the landfill to Sterling's mine. The attached PVRR analysis assumes that all gypsum would be diverted beginning with the opening of the new landfill.

*Assumptions in Ghent Project 30 PVRR Analysis*

1. Total price for loading, hauling and fees to Sterling Materials of \$10.50 in 2013.
2. Net CCP production of approximately 868,000 cubic yards (1,090,000 – 222,000 to CertainTeed).
3. Cubic yards to ton conversion factor – cy x 1.155 (based on Trans Ash conversion assumption of 1.3 MCY equals 1.5 million tons as hauled - see page 10 of Ghent CCP Plan).
4. Reduce Phase I construction cost by \$53,110,000<sup>2</sup> by continuing to place gypsum temporarily in existing gypsum stacking pond until shipment to Sterling.
 

Dry Gypsum Handling System	\$36,800,000
Gypsum Fines Project	\$12,600,000
Gypsum Dewatering Facility Earthwork	\$ 3,710,000
5. Phase III landfill construction cost eliminated. Phase II construction delayed from 2018 to 2030.
 

Phase I capacity – 14.7 MCY (See Ghent CCP Plan page 12)
Ash Production – 700,000 MCY (See Ghent CCP Plan page 7)
Phase I life until full – 21 years
6. Total Phase II and III construction costs - \$157,421,024 (timing and amounts of expenditures based retirement studies analysis in PSC Case No. 2011-00162)
 

Phase II construction cost - \$40,000,000
Phase III construction cost - \$117,421,024
7. Eliminate following Ghent Landfill Operating Expenses 2013 Estimates (See Ghent Landfill - Phase I attached)
 

Dry Gypsum Handling System	\$ 682,495
Hauling Gypsum to Landfill	
Loading	\$1,746,384
Phase I-2.25 mile round trip	\$3,997,156
Landfilling Gypsum	\$3,143,492
8. Continue 2018 Annual Depreciation Rate of 2.7899% on Eligible Capital through 2037
9. Continue 2018 Property Tax Expense Rate of .1259% on Eligible Capital through 2037
10. Apply KU O&M Escalation Rate of 6% and Discount Rate of 7.81% (See Ghent CCP Plan, page 22).

<sup>2</sup> See Ghent Landfill - Phase I attached.















Annual Revenue Requirements - Ghent Landfill - KU Project 30										
Capital						O&M				Total
	Phase 1	Phase 2	Phase 3	Final Cap	Total	Non-Power	Power	Beneficial Reuse	Total O&M	
12/31/2009	480,509	-	-	-	480,509	-	84,800	-	84,800	565,309
12/31/2010	5,098,729	-	-	-	5,098,729	-	127,832	-	127,832	5,226,561
12/31/2011	11,571,793	-	-	-	11,571,793	-	198,348	-	198,348	11,770,141
12/31/2012	19,480,236	-	-	-	19,480,236	-	294,577	-	294,577	19,774,813
12/31/2013	20,326,462	-	-	-	20,326,462	-	24,380,117	-	24,380,117	44,706,579
12/31/2014	20,544,834	-	-	-	20,544,834	-	26,056,704	-	26,056,704	46,601,539
12/31/2015	19,687,280	-	-	-	19,687,280	-	27,290,868	-	27,290,868	46,978,148
12/31/2016	18,799,210	52,684	-	-	18,851,894	-	28,578,421	-	28,578,421	47,430,316
12/31/2017	17,948,314	155,939	-	-	18,104,253	-	29,956,559	-	29,956,559	48,060,812
12/31/2018	17,131,380	993,170	-	-	18,124,550	-	31,612,174	-	31,612,174	49,736,723
12/31/2019	16,268,561	2,639,761	-	-	18,908,322	-	33,594,783	-	33,594,783	52,503,105
12/31/2020	15,405,743	3,691,001	-	-	19,096,743	-	35,566,861	-	35,566,861	54,663,605
12/31/2021	14,542,924	3,904,584	-	-	18,447,508	-	38,056,766	-	38,056,766	56,504,274
12/31/2022	13,680,105	3,734,217	-	-	17,414,322	-	39,920,041	-	39,920,041	57,334,363
12/31/2023	12,817,286	3,563,850	-	-	16,381,136	-	41,890,306	-	41,890,306	58,271,442
12/31/2024	11,954,467	3,393,483	2,082,456	-	17,430,407	-	44,529,811	-	44,529,811	61,960,218
12/31/2025	11,091,649	3,223,116	6,215,971	-	20,530,736	-	47,885,193	-	47,885,193	68,415,929
12/31/2026	10,228,830	3,052,749	10,179,118	-	23,460,698	-	51,399,644	-	51,399,644	74,860,342
12/31/2027	9,366,011	2,882,383	11,617,513	-	23,865,907	-	54,431,913	-	54,431,913	78,297,820
12/31/2028	8,503,192	2,712,016	11,117,397	-	22,332,605	-	55,178,509	-	55,178,509	77,511,114
12/31/2029	7,640,374	2,541,649	10,617,281	-	20,799,303	-	57,858,589	-	57,858,589	78,657,892
12/31/2030	6,777,555	2,371,282	10,117,164	-	19,266,001	-	60,699,474	-	60,699,474	79,965,474
12/31/2031	5,914,736	2,200,915	9,617,048	-	17,732,699	-	63,710,812	-	63,710,812	81,443,510
12/31/2032	5,051,917	2,030,548	9,116,931	-	16,199,397	-	66,902,830	-	66,902,830	83,102,226
12/31/2033	4,189,098	1,860,181	8,616,815	-	14,666,095	-	70,286,369	-	70,286,369	84,952,464
12/31/2034	3,326,280	1,689,814	8,116,699	-	13,132,793	-	73,872,921	-	73,872,921	87,005,713
12/31/2035	2,463,461	1,519,447	7,616,582	-	11,599,490	-	77,674,665	-	77,674,665	89,274,156
12/31/2036	1,600,642	1,349,080	7,116,466	-	10,066,188	-	81,704,515	-	81,704,515	91,770,703
12/31/2037	737,823	1,178,714	6,616,349	-	8,532,886	-	85,976,155	-	85,976,155	94,509,041
2009 PVRT	153,383,226	14,945,173	24,389,184	-	192,717,582	-	354,316,774	-	354,316,774	547,034,356
Cubic Yards	9,542,500	6,072,500	9,542,500	-	25,157,500	-	25,157,500	-	25,157,500	25,157,500
									\$/CY (PVRT)	\$ 21.74

Annual Revenue Requirements - Ghent Landfill - KU Project 30 with Beneficial Reuse -Sterling Ventures Mine										
Capital						O&M				Total
	Phase 1	Phase 2	Phase 3	Final Cap	Total	Non-Power	Power	Beneficial Reuse	Total O&M	
12/31/2009	480,509	-	-	-	480,509	-	84,800	-	84,800	565,309
12/31/2010	3,553,056	-	-	-	3,553,056	-	127,832	-	127,832	3,680,888
12/31/2011	7,177,211	-	-	-	7,177,211	-	198,348	-	198,348	7,375,559
12/31/2012	13,654,069	-	-	-	13,654,069	-	294,577	-	294,577	13,948,646
12/31/2013	14,678,389	-	-	-	14,678,389	-	24,380,117	(489,556)	23,890,561	38,568,950
12/31/2014	15,152,993	-	-	-	15,152,993	-	26,056,704	(495,467)	25,561,237	40,714,230
12/31/2015	14,539,006	-	-	-	14,539,006	-	27,290,868	(436,289)	26,854,579	41,393,584
12/31/2016	13,883,815	-	-	-	13,883,815	-	28,578,421	(387,511)	28,190,911	42,074,725
12/31/2017	13,255,915	-	-	-	13,255,915	-	29,956,559	(348,918)	29,607,640	42,863,556
12/31/2018	12,653,016	-	-	-	12,653,016	-	31,612,174	(501,636)	31,110,538	43,763,554
12/31/2019	12,016,402	-	-	-	12,016,402	-	33,594,783	(873,325)	32,721,458	44,737,860
12/31/2020	11,379,788	-	-	-	11,379,788	-	35,566,861	(1,101,031)	34,465,830	45,845,618
12/31/2021	10,743,173	-	-	-	10,743,173	-	38,056,766	(1,114,736)	36,942,030	47,685,203
12/31/2022	10,106,559	-	-	-	10,106,559	-	39,920,041	(1,025,754)	38,894,287	49,000,846
12/31/2023	9,469,945	-	-	-	9,469,945	-	41,890,306	(931,433)	40,958,872	50,428,818
12/31/2024	8,833,331	-	-	-	8,833,331	-	44,529,811	(1,382,478)	43,147,333	51,980,664
12/31/2025	8,196,717	-	-	-	8,196,717	-	47,885,193	(2,392,499)	45,492,694	53,689,411
12/31/2026	7,560,103	52,720	-	-	7,612,823	-	51,399,644	(3,382,211)	48,017,432	55,630,256
12/31/2027	6,923,489	156,032	-	-	7,079,520	-	54,431,913	(3,728,255)	50,703,658	57,783,179
12/31/2028	6,286,875	993,170	-	-	7,280,044	-	55,178,509	(3,378,832)	51,799,676	59,079,720
12/31/2029	5,650,260	2,639,761	-	-	8,290,021	-	57,858,589	(2,798,637)	55,059,952	63,349,973
12/31/2030	5,013,646	3,691,001	-	-	8,704,647	-	60,699,474	(2,349,913)	58,349,561	67,054,208
12/31/2031	4,377,032	3,904,584	-	-	8,281,616	-	63,710,812	(2,101,930)	61,608,882	69,890,498
12/31/2032	3,740,418	3,734,217	-	-	7,474,635	-	66,902,830	(1,942,577)	64,960,253	72,434,888
12/31/2033	3,103,804	3,563,850	-	-	6,667,654	-	70,286,369	(1,773,662)	68,512,707	75,180,361
12/31/2034	2,467,190	3,393,483	-	-	5,860,673	-	73,872,921	(1,594,613)	72,278,307	78,138,980
12/31/2035	1,830,576	3,223,116	-	-	5,053,692	-	77,674,665	(1,404,821)	76,269,844	81,323,536
12/31/2036	1,193,961	3,052,749	-	-	4,246,711	-	81,704,515	(1,203,641)	80,500,873	84,747,584
12/31/2037	557,347	2,882,383	-	-	3,439,730	-	85,976,155	(990,391)	84,985,764	88,425,494
2009 PVRR	111,212,472	5,355,077	-	-	116,567,550	-	354,316,774	(10,448,976)	343,867,798	460,435,348
Cubic Yards	17,350,000	7,807,500	-	-	25,157,500	-	25,157,500	-	25,157,500	25,157,500
									\$/CY (PVRR)	\$ 18.30

CASE	Option 30	Option 30 with Beneficial Reuse
PVRR		
Capital	\$ 192,717,582	\$ 116,567,550
O&M	354,316,774	343,867,798
Total	\$ 547,034,356	\$ 460,435,348
Delta to Least Cost	\$ 86,599,008	Least Cost
Unit Cost (2009 PVRR \$/CY)	\$ 21.74	\$ 18.30



# **Ghent Station: Analysis of Off-Site Gypsum Storage Proposal**



**PPL companies**

**Generation Planning & Analysis  
February 24, 2012**

February 24, 2012

## **1 Background**

In the June 2009 ECR filing, several alternatives were considered for storing coal combustion residuals (CCR) at the Ghent Station over the next 25 years. The least-cost alternative included (a) the construction of an on-site landfill to store ash and gypsum and (b) a short-term agreement with Trans Ash to move CCR offsite until new landfill capacity became available in 2013. After the ECR filing, the EPA issued new CCR rules and Trans Ash's storage facility was no longer considered to be an approved structural fill. In 2010, after updating its forecast of CCR production, the Company learned that the short-term need for off-site ash storage had been eliminated and that the short-term need for offsite gypsum storage had been reduced to 0.1 million cubic yards (MCY). Sterling Ventures (Sterling) was identified as a potential alternative for storing the gypsum but no agreement was ultimately reached. Based on the Company's most recent CCR production forecast, the short-term need for offsite gypsum storage no longer exists. In late 2011, Sterling Ventures submitted a new proposal for storing gypsum.

## **2 Sterling Proposal**

Sterling has proposed to store all gypsum from the Ghent Station (net of sales to CertainTeed) in its offsite storage facility for \$10.95/ton. Per the proposal, Sterling will excavate, load, and haul gypsum from the existing gypsum stack at the Ghent station. In doing this, Sterling claims that the Company can defer the need for subsequent landfill phases and avoid approximately \$53 million in capital costs for a dry gypsum handling system, gypsum fines project, and gypsum dewatering facility. In addition, by eliminating the need to store gypsum altogether, Sterling claims that Company can realize further capital savings by reverting to a CCR storage alternative from the 2009 ECR filing that included a smaller landfill located closer to the Ghent station. Finally, in addition to its proposal for storing gypsum, Sterling has proposed to backhaul high calcium limestone to the Ghent station for \$6.50/ton. See Attachment 1 for the Sterling Ventures proposal.

## **3 Analysis of Sterling Proposal**

The Company considered the Sterling proposal as an alternative to its current plan. Due to the costs and risks associated with operating a gypsum stack, the Company plans to retire the gypsum stack when the new landfill is in service. Therefore, contrary to Sterling's claims, Sterling will not be able to take gypsum from the existing gypsum stack and the Company will not be able to avoid the capital costs for the dry gypsum handling system, gypsum fines project, and gypsum dewatering facility. In addition, selecting a different landfill alternative at the Ghent station is not a viable option because this would require new environmental permits and delay the project by two years.

Table 1 contains a summary of the assumptions used in this analysis. The Sterling proposal defers the need for Phase II of the currently proposed landfill and eliminates the need for Phase III of the landfill altogether. Because gypsum comprises 60% of all CCR, Phases I and II of the landfill with the Sterling proposal have seven more years of landfill capacity than all phases of the landfill without the Sterling proposal. With the Sterling proposal, gypsum is dewatered at the station and transported by Sterling to

February 24, 2012

an offsite storage facility for \$10.95/ton. With the Company's current plan, gypsum with the same moisture content is delivered to the landfill for \$4.43/ton.

**Table 1 – Summary of Assumptions (\$2013)**

	<b>Landfill Only</b>	<b>Landfill w/ Sterling Ventures Proposal</b>
In-Service Year/Capacity of Phase I	2013 / 14.3 MCY	2013 / 14.3 MCY
In-Service Year/Capacity of Phase II	2022 / 14.5 MCY	2028 /14.5 MCY
In-Service Year/Capacity of Phase III	2031 / 23.0 MCY	N/A
Landfill End of Service Year	2046	2053
Dewatering Cost (all CCR)	\$112,200 per month	\$112,200 per month
Sterling Transport and Storage Cost	N/A	\$10.95/wet ton
Cost to Place CCR in Landfill	\$4.43/wet ton	\$4.43/wet ton

The results of this analysis are summarized in Table 2. The levelized cost per cubic yard of CCR placed (either in the landfill or transported to an offsite storage facility) is lower in the Company's current plan; the savings in the Sterling proposal associated with deferring or eliminating the need for landfill phases are more than offset by the higher variable costs of transporting gypsum to an offsite storage facility.

**Table 2 – Analysis Results**

	<b>Landfill Only</b>	<b>Landfill w/ Sterling Ventures Proposal</b>
Net Present Value Revenue Requirements (NPVRR, \$Millions)		
Capital	348	297
O&M	169	313
Total	517	610
Levelized NPVRR/CY (Dollars)	\$24.51	\$27.63

Sterling's cost to transport and store gypsum is \$10.95/wet ton. This cost must decrease to \$7.50/wet ton to break even with the Company's current proposal.

Concerning the option to purchase limestone from Sterling, Ghent's current cost of limestone is higher than \$6.50/ton. If the savings in limestone costs are credited to the Sterling proposal, the Sterling proposal compares more favorably to the Company's current proposal, but the Company's current proposal is still least-cost. With the limestone option, Sterling's 'break-even' cost increases from \$7.50/wet ton to \$8.75/wet ton.



## ENERGY AND ENVIRONMENT CABINET

Steven L. Beshear  
Governor

Department for Environmental Protection  
Division of Waste Management  
200 Fair Oaks Lane, Second Floor  
Frankfort, Kentucky 40601  
www.kentucky.gov

Leonard K. Peters  
Secretary

November 19, 2010

John W. Walters, Vice President  
Sterling Ventures, LLC  
376 South Broadway  
Lexington, KY 40508

**Certified Mail No. 7010 0780 0001 1440 8766**

RE: Registered Permit-By-Rule for Beneficial Reuse  
Sterling Mine  
Agency Interest No. 1461  
Application No. ARP20100001  
Gallatin County

Dear Mr. Walters:

The Division of Waste Management has reviewed the above referenced application and found it to be complete. The application received on July 15, 2010 is accepted with the conditions listed on the enclosed permit and as described in the approved plans and application.

Be advised, if you consider yourself aggrieved by the issuance of this permit, you have a right, pursuant to KRS 224.10-420(2) and 401 KAR 47:130 Section 2(3), to file with the cabinet a petition demanding a hearing. This right to demand a hearing shall be limited to a period of thirty (30) days after receipt of this permit. Be advised this acceptance does not supersede any local or county land use ordinances. If you need clarification or additional information, please contact Bob Bickner at (502) 564-6716 extension 4674.

Sincerely,

A handwritten signature in black ink, appearing to read "R. D. Gruzesky".

Ronald D. Gruzesky, P.E.  
Manager, Solid Waste Branch

Enclosure  
RDG/RAB/rcg

c: Reading file



**Kentucky Energy and Environment Cabinet  
Department for Environmental Protection  
Division of Waste Management**

**PERMIT**

**Facility:** **Sterling Ventures LLC**  
**100 Sierra Dr**  
**Verona, KY 41092**

**Permittee:** **Sterling Materials**  
**376 South Broadway**  
**Lexington, KY 40508**

**Agency Interest:** **Sterling Ventures LLC**  
**100 Sierra Dr**  
**Verona, KY 41092**

The Division has issued the permit under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. This permitted activity or activities are subject to all conditions and operating limitations contained herein. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses or approvals required by this Division or other state and local agencies.

No deviation from the plans and specifications submitted with your application or any condition specified herein is allowed, unless authorized in writing from the Division. Violation of the terms and conditions specified herein may render this permit null and void. All rights of inspection by representatives of the Division are reserved. Conformance with all applicable Waste Management Regulations is the responsibility of the permittee.

**Agency Interest ID #:** **1461**

**Solid Waste Permit #:** **SW00800023**

**County:** **Gallatin**

**Permitted Activities:**

<b>Subject Item</b>	<b>Activity</b>	<b>Type</b>	<b>Status</b>
<b>ACTV001</b>	<b>Beneficial Reuse-Special Waste-RPBR/00800023</b>	<b>Registered Permit by Rule</b>	<b>Active</b>

Permit Number: SW00800023

Agency Interest ID: 1461

PERMIT

**First Operational Permit Effective Date: 11/19/2010**

**Permit Effective Date: 11/19/2010**

**Permit Expiration Date: Life of facility**

**Permit issued: 11/19/2010**



**Ronald D. Gruzesky, P.E.**  
**Manager, Solid Waste Branch**

**Permit Conditions:**

**Subject Items**

**ACTV0001 - Beneficial Reuse-Special Waste-RPBR**

**Standard Requirements:**

1. General: The owner or operator of a special waste facility shall comply with KRS Chapter 224 and 401 KAR Chapters 30, 40 and 45 for the operation of special waste facilities. [KRS 224.50-760]
2. General: For operation of the special waste beneficial reuse that is not otherwise specified in 401 KAR 45:060, the owner or operator shall comply with KRS Chapter 224.50-760, 401 KAR 45:070 and the approved permit application(s). [401 KAR 45:070]

**Variances, Alternate Specifications and Special Conditions:**

1. Operation: The owner or operator is approved to beneficially reuse flue gas desulfurization gypsum produced by the KU Ghent Power Station in mined out sections of the Sterling Mine on the first level, in the Tyrone Limestone. [401 KAR 45:070 Section 3]
2. Operation: The owner or operator shall submit a revised registration prior to beneficially reusing sources or types of wastes other than FGD sludge from the KU Ghent power station, beneficially reusing FGD gypsum in areas other than the first level of the mine, changing the method of processing waste, adding new processes, changing the operator, or changing ownership. [401 KAR 45:070 Section 4]

Permit Number: SW00800023

Agency Interest ID: 1461

PERMIT

3. Operation: The owner or operator shall comply with the Environmental Performance Standards of 401 KAR 30:031. [401 KAR 30:031]
4. Operation: The owner or operator is approved to beneficially reuse up to 800,000 tons per year of FGD gypsum. [401 KAR 45:070 Section 3]
5. Operation: The owner or operator shall ensure that no water, except that necessary for dust suppression, shall enter the beneficial reuse area. [401 KAR 45:140 Section 2]
6. Operation: The owner or operator shall ensure that the FGD gypsum is stored only in areas with no standing water. [401 KAR 45:140 Section 2]

**County Sources - The owner or operator may accept waste as authorized by the cabinet pursuant to KRS 224 and/or 401 KAR Chapter 47 from the following counties:**

**Kentucky:** Carroll

**Approved Applications - The owner or operator shall comply with applicable statutes and regulations and the following approved applications:**

1. 11-19-2010 - ARP20100001 - Registered Permit-by-Rule Beneficial Reuse

DEP 7059F (1/06)



## ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION  
DIVISION OF WASTE MANAGEMENT  
14 REILLY ROAD  
FRANKFORT, KY 40601  
TELEPHONE NUMBER (502) 564-6716

REGISTERED PERMIT-BY-RULE  
For BENEFICIAL REUSE OF SPECIAL WASTE  
DEP 7059F (1/06)

### GENERAL INSTRUCTIONS

1. **APPLICABILITY** - This registration form must be completed and submitted to the Cabinet by persons who propose to beneficially re-use special waste.
2. **ASSISTANCE** – Questions regarding this form may be directed in writing to the Division of Waste Management, Solid Waste Branch at the address listed above, or by calling (502) 564-6716.
3. **SUBMISSION** – Please type or print legibly in permanent ink. Submit the original and one (1) copy of the completed registration form to the Division of Waste Management at the address noted above. If an item is not applicable to your facility write “N/A” in the space provided.
4. **LAWS AND REGULATIONS** – Registrants are expected to understand and comply with all laws and regulations applicable to beneficial reuse of special waste.

DEP 7059F (1/06)

**REGISTERED PERMIT-BY-RULE  
BENEFICIAL REUSE OF SPECIAL WASTE**

1.  New Registration - A registration number will be assigned by the Cabinet.  
2.  This is a proposed modification of an existing registration.

**Note:** (If you checked **item 2**, complete one or both of the following two items.)

3. Agency Interest #: \_\_\_\_\_ 4. Registration #: \_\_\_\_ - \_\_\_\_\_

**Registrant Information**

(The corporation, LLC, business, person, government agency, etc., that owns or operates the facility.)

5. Registrant Name: Sterling Ventures, LLC d/b/a Sterling Materials  
6. Registrant Mailing Address: 376 South Broadway  
7. City: Lexington 8. State: KY 9. Zip Code: 40508  
10. Contact Person: Samuel A.B. Boone 11. Title: President  
12. Phone #: (859) 259-9600 13. Cell #: (859) 621-4121  
14. Fax #: (859) 259-9601 15. E-Mail Address: aboone@sterlingventures.com

**Special Waste Facility Information**

16. Facility Name: Sterling Mine 17. County: Gallatin  
18. Facility Location: 100 Sierra Drive 19. E-Mail Address: \_\_\_\_\_  
(For street or physical location only. Do not use P. O. Box #'s, etc.)  
20. City: Verona 21. Zip Code: 41092  
22. Facility Contact Person: Sam Van 23. Title: Mine Superintendent  
24. Phone #: (859) 567-7300 Fax #: (859) 567-7313 Cell #: (859) 621-2142

**Preparer Information**

(Complete items 27 – 36 if the following information concerning the person preparing this registration is different from the contact persons named above.)

27. Preparers Name: John Walters 28. Company: Sterling Ventures, LLC  
29. Mailing Address: 376 S. Broadway 30. E-mail Address: johnwalters@sterlingventures.com  
31. City: Lexington 32. State: KY 33. Zip Code: 40508  
34. Phone #: (859) 259-9600 35. Fax #: (859) 259-9601 36. Cell #: (859) 621-3990

DEP 7059F (1/06)

37. List the source (special waste generating facility) of the special waste to be beneficially reused. If there are multiple sources and more space is needed, use additional sheets and label as **Attachment 1**.

Special waste generator: KU Ghent Generation Station, Ghent, Carroll County, Kentucky

Special waste generator: \_\_\_\_\_

Special waste generator: \_\_\_\_\_

Special waste generator: \_\_\_\_\_

38. Provide, as **Attachment 2**, a description of the type and anticipated volume of special waste to be beneficially reused.
39. Provide as **Attachment 3**, a copy of the Toxicity Characteristic Leaching Procedure (TCLP) laboratory analysis for each type of special waste to be beneficially reused.

**Note:** You may omit the TCLP analysis or specific parameters of the analysis based upon your knowledge of the Special Waste, pursuant to 40 CFR 262.11. Should you elect to do this, a certified statement accepting responsibility will be required. Polychlorinated Biphenyls (PCBs) may also be omitted from the parameters listed in 401 KAR 45:100 Section 6(20)(b). Any certified statement for the omission of the TCLP or PCB data should be labeled as **Attachment 4**.

40. Provide, as **Attachment 5**, a description of how the special waste will be managed.
41. Provide, as **Attachment 6**, a description of how management and reuse of the special waste meets the environmental performance standards of 401 KAR 30:031.
42. **Attachment 7** is to be used to maintain a record of the special waste sources and amounts received. This form shall be utilized for quarterly reports submitted to the Cabinet.

DEP 7059F (1/06)

43. Certification pursuant to 401 KAR 45:030 Section 10(4):

**“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations.”**

Signature of Registrant \_\_\_\_\_ Date \_\_\_\_\_

Name of Registrant (Typed or Printed) \_\_\_\_\_

Title \_\_\_\_\_

Subscribed and sworn to before me by \_\_\_\_\_

this the \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

Notary Public Signature \_\_\_\_\_

My Commission Expires \_\_\_\_\_

## **Attachment 2**

### **Type and Volume of Special Waste**

Sterling Ventures is proposing to use up to 800,000 tons per year of FGD Gypsum produced from the KU Ghent Power Station in Ghent Kentucky to fill mine voids in mined out sections of Sterling's underground limestone mine located at 100 Sierra Drive, Verona, Gallatin County, Kentucky. Gypsum is calcium sulfate dihydrate, or  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , which comes primarily from two sources: (i) Mined gypsum, a common mineral found around the world in sedimentary rock formations, from which it is mined or quarried, and (ii) FGD gypsum, which is produced as a byproduct from coal-fired electric utilities and is a synthetic material essentially identical in chemical structure to mined gypsum. The underground mine has the capacity to use 1,000,000 tons per year of gypsum for as long as the mine is operating at current limestone sales volumes.

#### **FGD Gypsum**

Scrubbers are attached to coal-fired power plants to limit emissions of the sulfur which is released when coal is burned. The scrubbers spray liquid lime or limestone slurry into the flue gas path, where it reacts with sulfur in the gas to form calcium sulfite, an intermediate product with little practical value. Calcium sulfite is commonly known as "scrubber sludge."

However, newer FGD scrubbing technologies can add an extra step to the scrubbing process known as "forced oxidation" which oxidizes the calcium sulfite and produces calcium sulfate dihydrate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), or FGD gypsum. The FGD gypsum is easily dewatered and can be marketable in the wallboard and agricultural industries.

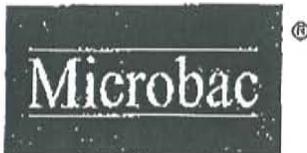
The Ghent power plant has installed forced oxidation scrubbers on all four of its generating units with a projected FGD gypsum production of approximately 800,000 tons per year. The Ghent plant has a contract to provide the FGD Gypsum to the CertainTeed, Inc. wallboard plant located in East Carrolton, Kentucky. KU has projected CertainTeed's usage to be approximately 222,000 ton per year. Excess FGD Gypsum at Ghent is placed on the plant's Gypsum Stacking Pond. The Stacking Pond is currently listed as one of the 49 High Hazard impoundment facilities in the United States listed by the EPA in its *Coal Combustion Residues (CCR) - Surface Impoundments with High Hazard Potential Ratings* report. (See EPA530-F-09-006 June 2009 (updated August 2009)).

Because CertainTeed cannot utilize all of Ghent's FGD Gypsum, the opportunity to beneficially reuse this excess of FGD gypsum for filling Sterling's underground mine voids is an attractive alternative. In addition to providing a benefit to Sterling in filling underground voids to promote improved airflow in the mine, placing the Ghent's excess gypsum at Sterling is important to substantially reducing or eliminating the volume of excess gypsum in the gypsum stacking pond.

## **Attachment 3**

### **Toxicity Characteristic Leaching Procedure Laboratory Analysis**

See attached Exhibit 3-A



# EXHIBIT 3A

## Microbac Laboratories, Inc.

KENTUCKY TESTING LABORATORY DIVISION  
3323 Gilmore Industrial Blvd. Louisville, KY 40213 502.962.6400 Fax: 502.962.6411  
Evansville, IN 812.464.9000 | Lexington, KY 859.276.3506 | Paducah, KY 270.898.3637

Member

ACIL

**Chemical, Biological, Physical, Molecular, and Toxicological Services**
**ELECTRONIC CERTIFICATE OF ANALYSIS**
**1005-00672**

**LG & E (E ON US)**  
**PAUL PUCKETT**  
**EON-US / ANNUAL CCP EVALUATION**

**Date Reported** 05/19/2010  
**Date Received** 05/11/2010  
**Dates Sampled** 05/04/2010-05/06/2010

Analysis	Out of Spec	Qualif	Result	Unit	Min	Max	Method	Cus Limit	PQL or Std Limit	Date	Time	Tech
Sample: 014 GHENT - UNIT 1 FLY ASH .....continued										Date & Time Sampled: 05/06/2010	Ⓢ 12:00	
Sample: 015 GHENT - UNIT 2 FLY ASH										Date & Time Sampled: 05/06/2010	Ⓢ 12:00	
DATE EXTRACTED TCLP		COMPLETED	---				SW846 1311			04/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C	0.2		05/18/10	2:11	EML
BARIUM, TCLP			0.45	MG/L		100.0	SW846 6010C	0.002		05/18/10	2:11	EML
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C	0.004		05/19/10	13:39	EML
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.01		05/19/10	13:39	EML
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.02		05/19/10	13:39	EML
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C	0.004		05/19/10	13:39	EML
SELENIUM, TCLP			<0.20	MG/L		1.0	SW846 6010C	0.1		05/18/10	2:11	EML
SILVER, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.01		05/19/10	13:39	EML
Sample: 016 GHENT - GYPSUM STACK										Date & Time Sampled: 05/06/2010	Ⓢ 12:00	
DATE EXTRACTED TCLP		COMPLETED	---				SW846 1311			04/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C	0.2		05/18/10	2:16	EML
BARIUM, TCLP			<0.10	MG/L		100.0	SW846 6010C	0.002		05/18/10	2:16	EML
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C	0.004		05/19/10	13:43	EML
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.01		05/19/10	13:43	EML
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.02		05/19/10	13:43	EML
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C	0.004		05/19/10	13:43	EML
SELENIUM, TCLP			<0.20	MG/L		1.0	SW846 6010C	0.1		05/18/10	2:16	EML
SILVER, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.01		05/19/10	13:43	EML
Sample: 017 GHENT - GYPSUM										Date & Time Sampled: 05/06/2010	Ⓢ 12:00	
DATE EXTRACTED TCLP		COMPLETED	---				SW846 1311			04/13/10	18:00	RFV
[TCLP Metals]							SW846 6010C					
ARSENIC, TCLP			<0.20	MG/L		5.0	SW846 6010C	0.2		05/18/10	2:29	EML
BARIUM, TCLP			<0.10	MG/L		100.0	SW846 6010C	0.002		05/18/10	2:29	EML
CADMIUM, TCLP			<0.10	MG/L		1.0	SW846 6010C	0.004		05/19/10	13:48	EML
CHROMIUM, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.01		05/19/10	13:48	EML
LEAD, TCLP			<0.10	MG/L		5.0	SW846 6010C	0.02		05/19/10	13:48	EML
MERCURY, TCLP			<0.10	MG/L		0.2	SW846 6010C	0.004		05/19/10	13:48	EML



# Microbac Laboratories, Inc.

Member

KENTUCKY TESTING LABORATORY DIVISION  
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Chemical, Biological, Physical, Molecular, and Toxicological Services

## ELECTRONIC CERTIFICATE OF ANALYSIS

1005-00672

LG &amp; E (EON US)

PAUL PUCKETT

EON-US / ANNUAL CCP EVALUATION

Date Reported 05/19/2010

Date Received 05/11/2010

Dates Sampled 05/04/2010-05/06/2010

Analysis	Out of Spec	Qualif	Result	Unit	Min	Max	Method	Cus Limit	EQL or Std Limit	Date	Time	Tech
Sample: 017 GHENT - GYPSUM										Date & Time Sampled: 05/06/2010 @ 12:00		
.....continued												
SELENIUM, TCLP			<0.20	MG/L	1.0	5W846 5010C		0.1	05/19/10		2:29	EML
SILVER, TCLP			<0.10	MG/L	5.0	5W846 5010C		0.01	05/19/10		13:48	EML

THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE:

LABORATORY DIRECTOR, KENTUCKY DIVISION

As regulatory limits change frequently, Microbac advises the recipient of this report to confirm such limits with the appropriate Federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Andrew Clifton, the Laboratory Director at 502.962.6400. You may also contact both James Nokes, President and Robert Morgan, Chief Operating Officer at president@microbac.com.

## **Attachment 5**

### **Management of Special Waste**

Gypsum will be excavated from the Ghent's Gypsum Stacking Pond by excavator and loaded in tarped, tri-axel dump trucks for transportation to Sterling's mine. Sterling Venture's Verona mine produces limestone from underground operations only. It does not mine any limestone from open pits. Sterling mines from three underground levels, located in solid limestone bedrock. From a geological standpoint, the sea level elevation of the roof of the uppermost level is approximately 136 feet above sea level. The roofs of the second and third levels are approximately 28 feet above, and 149 feet below sea level, respectively. From a reference point, the lowest most level of the Ohio River adjacent to the Sterling Mine is approximately 401 feet above sea level. (see Exhibit 6C)

Once at the mine, the gypsum will be dumped directly from the dump trucks, via shaft, to the first level (the "Tyrone" seam) of the underground mine. Once underground, the gypsum will be carried by loader or conveyor to the mined out areas then stacked, pushed and compacted to fill the mine voids.

## **Attachment 6**

### **Management and Reuse in compliance with 401 KAR 30:031**

The following is a summary of the how the management and reuse meets each of the Sections of 401 KAR 30:031.

#### **Section 2. Floodplains.**

All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or restrict the flow of, the 100 year floodplain.

#### **Section 3. Endangered Species.**

All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or result in the destruction of the habitat of any threatened or endangered species.

#### **Section 4. Surface Waters.**

All gypsum will be placed in Sterling's underground mine. Gypsum will not be placed or stored above ground and therefore will have no impact on, or cause a discharge into, any waters of the Commonwealth.

#### **Section 5. Groundwater.**

All gypsum will be placed in solid bedrock in an area below the bottom level of the uppermost aquifer. Gypsum will not be placed or stored above ground and therefore will have no impact on, or cause a discharge into, any waters of the Commonwealth.

The uppermost mining level of Sterling's underground mine is located in what is known as the Tyrone seam of limestone. The Tyrone Limestone in north central Kentucky contains at least five potassium bentonites. Bentonite is a soft, low-specific-gravity, expandable clay. It is altered volcanic ash and because of its peculiar property of expanding when wet, bentonite is effective as a water sealer, especially to prevent pond leakage, and is also used in rotary drilling muds to prevent contaminating formations with drilling fluid. Drillers have labeled the two most prominent Tyrone bentonite beds the Mud Cave and Pencil Cave. The bentonite acts as an acquitard or confining layer that will prevent any contact of the gypsum with groundwater.

Attached as Exhibit 6-A is an excerpt from the U.S. Geological Survey - Hydrologic Atlas 730-K, Orville B. Lloyd, Jr., and William L. Lyke, 1995, describing the impact of the bentonite as a barrier to groundwater contact.

The roof of the uppermost mining level is over 200 feet below the bottom of any recorded well in the area. Regional wells do not extend below the bentonite levels in the Tyrone limestone. Attached as Exhibit 6-B is a listing of all recorded water wells in the area, their depth and distance between the bottom of the well and the roof of the Tyrone mining level.

Attached as Exhibit 6-C is a cross section of the Sterling's underground mine showing the Tyrone level mine in relation to the Mud Cave and Pencil Cave bentonite seams.

**Section 6. Application to Land Use.**

All gypsum will be placed underground. Gypsum will not be placed or stored above ground and therefore will have no impact on land use.

**Section 7. Polychlorinated Biphenals.**

FGD Gypsum does not contain PCBs.

**Section 8. Disease.**

All gypsum will be placed underground and therefore will be automatically covered. Gypsum is an inert naturally occurring mineral. Underground placement will eliminate any human health or environmental issues. No sewage sludge or septic tank materials are pumped or stored underground at Sterling's underground mine.

**Section 9. Air.**

Underground storage will not involve burning of gypsum, which is not a flammable material. Underground storage approximately 400 feet below the surface will prohibit the airborne release of gypsum.

**Section 10. Safety.**

Neither limestone mining nor gypsum produces any explosive gases or a fire hazard. Sterling's underground mine is gated, which prohibits any type of uncontrolled public access.

**Section 11. Public Nuisance.**

Underground storage will eliminate any public nuisance due to blowing litter, debris or other waste.

**Section 12. Wetlands.**

All gypsum will be placed underground. Gypsum will not be placed or stored above ground and therefore will have no impact on any wetlands

**Section 13. Karst.**

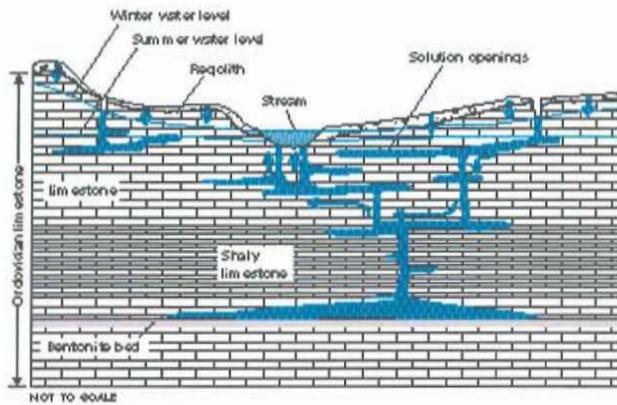
There are no sinkholes on or near the approximately 1,000 acres owned by Sterling. No surface water enters or exits the mine through any karst terrain or feature.

**Section 14. Compliance.**

Sterling will comply with all applicable requirements of KRS Chapter 224 and administrative regulation promulgated thereto.

### Exhibit 6A

Confining units, such as beds of shaly limestone and bentonite, affect the depth to which freshwater circulates ([fig. 97](#)). Thin bentonite zones, which consist of clay particles that expand or swell when they become wet, form layers of low permeability that effectively impede the vertical movement of ground water. For example, in areas where the bentonite layers are continuous, the downward movement of ground water is restricted. This restriction isolates the ground water below the bentonite from the zone of dynamic circulation above the bentonite. U.S. Geological Survey - Hydrologic Atlas 730-K, Orville B. Lloyd, Jr., and William L. Lyke, 1995



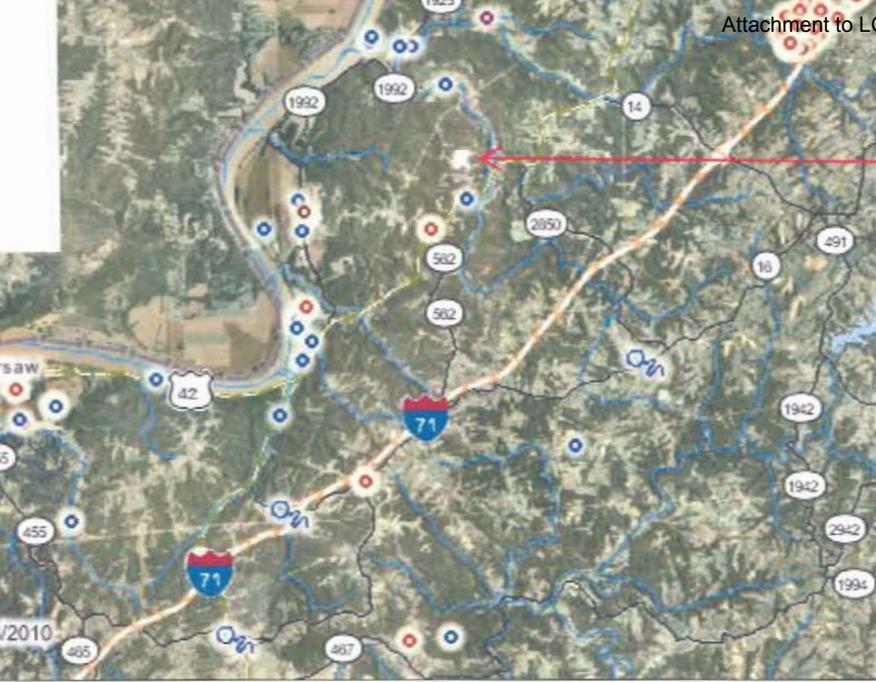
#### EXPLANATION

➡ Direction of ground-water movement

Modified from Zurawski, Ann, 1978, Summary appraisals of the Nation's ground-water resources—Tennessee region: U.S. Geological Survey Professional Paper 813-L, 35 p.

**Figure 97.** The limestone and dolomite aquifers contain small quantities of insoluble material and, therefore, produce only a thin layer of residuum when weathered. Recharge water percolates through the thin layer of surface material, called regolith, and subsequently moves through vertical fractures and horizontal bedding planes in the rocks. The slightly acidic water dissolves some of the limestone and dolomite as it moves to streams and other areas of discharge, such as springs and wells. The vertical movement of the recharge water and, therefore, the depth of development of solution openings, are restricted by zones of low permeability.

**EXHIBIT 6B**



Sterling Mine

Displayed at scales below 1:100,000

Scale

Color imagery (fsa)

7 in | full pg (6.8 x 9.4 in)

"File --> Print Preview..." and print at 100% scaling.

**Map Tools:**

**Other Tools:**

zoom in	zoom out	zoom full
zoom last	pan	get coords
<b>Move Map:</b>		

zoom to a location

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[Bookmark Map](#)

AKGWA		Construction				Surface	Bottom	Delta to			Regulatory Program		
NUMBER	lat27	lon27	Quadrangle	County	Date	Primary Use	Elevation	Total Depth	Elevation	Mine Roof	Owner	Owner Business	Regulatory Program
210	38.77528	-84.8131	Patriot	Gallatin	3/12/1987	DOMESTIC - SINGLE HOUSEHOLD	480	96	384	248	Wessells Constru		
950	38.81611	-84.8061	Patriot	Gallatin	6/22/1987	DOMESTIC - SINGLE HOUSEHOLD	510	99	411	275	Doolin		
2070	38.7525	-84.8722	Patriot	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	570				Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	570				Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	2/28/1986	DOMESTIC - SINGLE HOUSEHOLD	570	90	480	344	Hayton		
2070	38.7525	-84.8722	Patriot	Gallatin	2/28/1986	DOMESTIC - SINGLE HOUSEHOLD	570	90	480	344	Hayton		
2071	38.7975	-84.8078	Patriot	Gallatin	4/7/1986	DOMESTIC - SINGLE HOUSEHOLD	470	78	392	256	Wilker / Mcintos		
2072	38.79167	-84.8039	Patriot	Gallatin	4/22/1986	DOMESTIC - SINGLE HOUSEHOLD	460	57	403	267	Perry		
3030	38.82306	-84.7594	Patriot	Gallatin	8/13/1985	DOMESTIC - SINGLE HOUSEHOLD	600	100	500	364	Whalen		
3885	38.82278	-84.8069	Patriot	Gallatin	7/30/1987	DOMESTIC - SINGLE HOUSEHOLD	524	142	382	246	Sproul		
6426	38.79722	-84.8072	Patriot	Gallatin	3/28/1988	DOMESTIC - SINGLE HOUSEHOLD	475	50	425	289	Hudepohl		
6427	38.775	-84.9003	Florence	Gallatin	8/31/1988	INDUSTRIAL - GENERAL	485	92	393	257		Irving Materials Inc	
6429	38.7875	-84.8064	Patriot	Gallatin	5/16/1989	DOMESTIC - SINGLE HOUSEHOLD	475	65	410	274	Heil		
7861	38.87556	-84.7808	Rising Sun	Boone	10/8/1990	DOMESTIC - SINGLE HOUSEHOLD	495	70	425	289	Ralston		
8554	38.79639	-84.8078	Patriot	Gallatin	10/29/1987	DOMESTIC - SINGLE HOUSEHOLD	470	93	377	241	Schwab		
10409	38.75417	-84.9117	Florence	Gallatin	1/22/1993	DOMESTIC - SINGLE HOUSEHOLD	550	83	467	331	Fender		
14147	38.88472	-84.7817	Rising Sun	Boone	12/13/1988	DOMESTIC - SINGLE HOUSEHOLD	530	86	444	308	Wood		
14148	38.88472	-84.7817	Rising Sun	Boone	12/14/1988	DOMESTIC - SINGLE HOUSEHOLD	430	93	337	201	Wood		
20278	38.78389	-84.8475	Patriot	Gallatin	8/18/1986	DOMESTIC - SINGLE HOUSEHOLD	470	80	390	254	Boschert		
20583	38.88778	-84.7597	Rising Sun	Boone	1/1/1900		550				Waljih		
21565	38.76806	-84.7294	Verona	Grant	10/3/1986	DOMESTIC - SINGLE HOUSEHOLD	710	80	630	494	Ellis		
21577	38.88389	-84.7586	Rising Sun	Boone	6/5/1994	DOMESTIC - SINGLE HOUSEHOLD	520	80	440	304	Wilbur		
27010	38.8575	-84.7864	Patriot	Boone	6/8/1992	DOMESTIC - SINGLE HOUSEHOLD	477	56	421	285	Fred		
29603	38.77078	-84.9396	Florence	Gallatin	1/1/1900	PUBLIC - TRANSIENT, NON-COMMUNITY	460				Loewendick	Rivers Edge Campground	
34428	38.87778	-84.6744	Union	Boone	7/20/1993		810	63	747	611	Vaske		
34436	38.84806	-84.765	Patriot	Boone	1/20/1987	DOMESTIC - SINGLE HOUSEHOLD	495	64	431	295	Gilliand		
34438	38.90361	-84.7714	Rising Sun	Boone	12/10/1986	DOMESTIC - SINGLE HOUSEHOLD	600	100	500	364	Kurkel		
34474	38.89556	-84.6681	Union	Boone	4/23/1993		810	83	727	591	Allen		
34475	38.89694	-84.6694	Union	Boone	12/4/1992	DOMESTIC - SINGLE HOUSEHOLD	820	103	717	581	McDaniel		
37305	38.78611	-84.8903	Florence	Gallatin	10/1/1994	HEAT PUMP - OPEN LOOP	495	94	401	265		Gallatin County Schools	
37311	38.76583	-84.9856	Florence	Gallatin	1/19/1995	INDUSTRIAL - GENERAL	470	91	379	243		Steel Technologies Inc	
37376	38.78222	-84.9017	Florence	Gallatin	1/1/1930	PUBLIC - COMMUNITY	491	136	355	219		Warsaw Water Works	Drinking Water
37377	38.78262	-84.9017	Florence	Gallatin	1/1/1930	PUBLIC - COMMUNITY	491	96	395	259		Warsaw Water Works	Drinking Water
37378	38.77417	-84.8856	Florence	Gallatin	1/1/1967	AGRICULTURE - LIVESTOCK WATERING	505	78	427	291	Smith		
37400	38.77861	-84.8778	Florence	Gallatin	4/27/1995		500				Oldendick	Sugar Bay Golf Inc	
39222	38.77889	-84.8764	Florence	Gallatin	1/1/1965		503				Oldendick	Sugar Bay Golf Inc	
48660	38.77528	-84.8867	Florence	Gallatin	1/1/1900	DOMESTIC - SINGLE HOUSEHOLD	510				Beall		
49372	38.78583	-84.8931	Florence	Gallatin	11/1/1999	HEAT PUMP - OPEN LOOP	495					Gallatin County Schools	
49377	38.77063	-84.9102	Florence	Gallatin	2/28/2000	PUBLIC - COMMUNITY	500					Gallatin County Water District	Drinking Water
51920	38.89969	-84.7986	Rising Sun	Boone	1/1/1974	PUBLIC - TRANSIENT, NON-COMMUNITY	470	9	461	325		Camp Turn About	
55811	38.85639	-84.7742	Patriot	Boone	4/19/2002	DOMESTIC - SINGLE HOUSEHOLD	490	70	420	284		Big Bone Marina	
58332	38.85639	-84.7775	Patriot	Boone	5/1/2002	DOMESTIC - SINGLE HOUSEHOLD	460	63	397	261		Big Bone Marina	
58338	38.89111	-84.7776	Rising Sun	Boone	1/23/2002	DOMESTIC - SINGLE HOUSEHOLD	605	80	525	389	Parker		
65141	38.82028	-84.8053	Patriot	Gallatin	1/1/1900	INDUSTRIAL - GENERAL	523					Nugent Sand Co - Warsaw Plant	
40004237	38.72534	-84.7774	Glencoe	Grant		DOMESTIC - SINGLE HOUSEHOLD							
40004241	38.78173	-84.8874	Florence	Gallatin		UNKNOWN	475						
40004243	38.79923	-84.8049	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		140					
40004245	38.81673	-84.8169	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		101					
40005375	38.77145	-84.9049	Florence	Gallatin		UNKNOWN	515						
40005376	38.77423	-84.9747	Florence	Gallatin		UNKNOWN	455						
40005378	38.78257	-84.9019	Florence	Gallatin		PUBLIC	490	140	350	214			
40005886	38.72618	-84.7655	Glencoe	Grant		UNKNOWN							

AKGWA		Construction				Surface	Bottom	Delta to	Owner	Owner Business	Regulatory Program	
NUMBER	lat27	lon27	Quadrangle	County	Date	Primary Use	Elevation	Total Depth				Elevation
40005892	38.76951	-84.9305	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		55				
40005893	38.76951	-84.9305	Florence	Gallatin		UNKNOWN	460					
40005894	38.77395	-84.9747	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		58				
40005895	38.85867	-84.7858	Patriot IN	Boone		DOMESTIC - SINGLE HOUSEHOLD	490	29	461	325		
40006041	38.78173	-84.8874	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		40				
40006325	38.77812	-84.8761	Florence	Gallatin		UNKNOWN	510		510	374		
40006326	38.78173	-84.8874	Florence	Gallatin		UNKNOWN	475		475	339		
40006327	38.79479	-84.8077	Patriot IN	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		60				
40006328	38.79923	-84.8049	Patriot	Gallatin		UNKNOWN	490					
40006757	38.72534	-84.7774	Glencoe	Grant		UNKNOWN						
40006762	38.77145	-84.9049	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		146				
40006763	38.77423	-84.9747	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		87				
40006764	38.86256	-84.7527	Patriot IN	Boone		PUBLIC						
40007580	38.72618	-84.7655	Glencoe	Grant		DOMESTIC - SINGLE HOUSEHOLD						
40007585	38.74757	-84.9699	Sanders	Gallatin		DOMESTIC - SINGLE HOUSEHOLD						
40007586	38.77395	-84.9747	Florence	Gallatin		UNKNOWN	453					
40007588	38.77812	-84.8761	Florence	Gallatin		DOMESTIC - SINGLE HOUSEHOLD		80				
80003234	38.8625	-84.6614	Verona	Boone	7/22/1993	ITORING WELL - WATER LEVEL MONITORING	800	18	782	646	Bavarian Trucking Co Inc	Solid Waste
80003235	38.86139	-84.6572	Verona	Boone	7/14/1993	ITORING WELL - WATER LEVEL MONITORING	800	20.7	779.3	643.3	Bavarian Trucking Co Inc	Solid Waste
80003236	38.86083	-84.6592	Verona	Boone	7/10/1993	ITORING WELL - WATER LEVEL MONITORING	780	17.5	762.5	626.5	Bavarian Trucking Co Inc	Solid Waste
80003239	38.85917	-84.6619	Verona	Boone	7/22/1993	MONITORING WELL - AMBIENT MONITORING	740	18.2	721.8	585.8	Bavarian Trucking Co Inc	Solid Waste
80003240	38.85944	-84.6628	Verona	Boone	7/10/1993	MONITORING WELL - AMBIENT MONITORING	720	27	693	557	Bavarian Trucking Co Inc	Solid Waste
80003241	38.85972	-84.6639	Verona	Boone	7/10/1993	MONITORING WELL - AMBIENT MONITORING	720	22.9	697.1	561.1	Bavarian Trucking Co Inc	Solid Waste
80003242	38.85917	-84.665	Verona	Boone	7/21/1993	MONITORING WELL - AMBIENT MONITORING	720	18.4	701.6	565.6	Bavarian Trucking Co Inc	Solid Waste
80003243	38.85972	-84.6667	Verona	Boone	7/21/1993	MONITORING WELL - AMBIENT MONITORING	700	18.1	681.9	545.9	Bavarian Trucking Co Inc	Solid Waste
80003244	38.85944	-84.6678	Verona	Boone	7/20/1993	MONITORING WELL - AMBIENT MONITORING	720	18.9	701.1	565.1	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	12/30/2000	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003245	38.85556	-84.6678	Verona	Boone	7/14/1993	MONITORING WELL - AMBIENT MONITORING	800	18.1	781.9	645.9	Bavarian Trucking Co Inc	Solid Waste
80003246	38.86	-84.6642	Verona	Boone	7/27/1993	MONITORING WELL - AMBIENT MONITORING	720	18.3	701.7	565.7	Bavarian Trucking Co Inc	Solid Waste
80011401	38.86139	-84.6542	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	847.49				Bavarian Trucking Co Inc	Solid Waste
80011402	38.86167	-84.6539	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	847.92				Bavarian Trucking Co Inc	Solid Waste
80011403	38.85778	-84.6592	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	833.59				Bavarian Trucking Co Inc	Solid Waste
80011404	38.85806	-84.6589	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	833.65				Bavarian Trucking Co Inc	Solid Waste
80011405	38.85583	-84.6619	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	834.72				Bavarian Trucking Co Inc	Solid Waste
80011406	38.855	-84.6639	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	816.7				Bavarian Trucking Co Inc	Solid Waste
80011407	38.85611	-84.6672	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	800.5				Bavarian Trucking Co Inc	Solid Waste
80011408	38.85861	-84.67	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	766.27				Bavarian Trucking Co Inc	Solid Waste
80011409	38.86	-84.6692	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	767.85				Bavarian Trucking Co Inc	Solid Waste
80011410	38.86222	-84.6689	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	641.24				Bavarian Trucking Co Inc	Solid Waste
80011411	38.86222	-84.6669	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	643.85				Bavarian Trucking Co Inc	Solid Waste
80011412	38.86222	-84.6681	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	604.9				Bavarian Trucking Co Inc	Solid Waste
80011413	38.8625	-84.6622	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	828.1				Bavarian Trucking Co Inc	Solid Waste
80011414	38.8625	-84.6622	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	828.01				Bavarian Trucking Co Inc	Solid Waste
80011415	38.86417	-84.6594	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	780.48				Bavarian Trucking Co Inc	Solid Waste
80011416	38.86417	-84.6589	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	780.26				Bavarian Trucking Co Inc	Solid Waste
80011417	38.86556	-84.6625	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	784.79				Bavarian Trucking Co Inc	Solid Waste

AKGWA						Construction		Surface		Bottom	Delta to			
NUMBER	lat27	lon27	Quadrangle	County	Date	Primary Use	Elevation	Total Depth	Elevation	Mine Roof	Owner	Owner Business	Regulatory Program	
80011418	38.86361	-84.6642	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	762.46					Bavarian Trucking Co Inc	Solid Waste	
80011419	38.86361	-84.6583	Verona	Boone	1/1/1900	MONITORING WELL - AMBIENT MONITORING	784.17					Bavarian Trucking Co Inc	Solid Waste	
80012127	38.90417	-84.8358	Rising Sun	Boone	11/10/1980	MONITORING WELL - AMBIENT MONITORING	530	86	444	308		Cincinnati Gas & Electric	Solid Waste	
80012127	38.90417	-84.8358	Rising Sun	Boone	11/10/1980	MONITORING WELL - AMBIENT MONITORING	530	86	444	308		Duke Energy Kentucky Inc	Solid Waste	
80012133	38.90083	-84.8483	Rising Sun	Boone	11/26/1980	MONITORING WELL - AMBIENT MONITORING	475	57	418	282		Cincinnati Gas & Electric	Solid Waste	
80012133	38.90083	-84.8483	Rising Sun	Boone	11/26/1980	MONITORING WELL - AMBIENT MONITORING	475	57	418	282		Duke Energy Kentucky Inc	Solid Waste	
80012134	38.90083	-84.8411	Rising Sun	Boone	11/13/1980	MONITORING WELL - AMBIENT MONITORING	475	108	367	231		Cincinnati Gas & Electric	Solid Waste	
80012134	38.90083	-84.8411	Rising Sun	Boone	11/13/1980	MONITORING WELL - AMBIENT MONITORING	475	108	367	231		Duke Energy Kentucky Inc	Solid Waste	
80012135	38.90111	-84.8361	Rising Sun	Boone	3/28/1991	MONITORING WELL - AMBIENT MONITORING	475	33	442	306		Cincinnati Gas & Electric	Solid Waste	
80012135	38.90111	-84.8361	Rising Sun	Boone	3/28/1991	MONITORING WELL - AMBIENT MONITORING	475	33	442	306		Duke Energy Kentucky Inc	Solid Waste	
80012488	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	18	662	526		Old Starlite Tavern	UST	
80012489	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	15	665	529		Old Starlite Tavern	UST	
80012490	38.81611	-84.7694	Patriot	Gallatin	4/20/1994	MONITORING WELL - AMBIENT MONITORING	680	8.5	671.5	535.5		Old Starlite Tavern	UST	
80026034	38.85972	-84.6603	Verona	Boone	5/8/1995	MONITORING WELL - AMBIENT MONITORING	759.34	16	743.34	607.34		Bavarian Trucking Co Inc	Solid Waste	
80026035	38.86	-84.665	Verona	Boone	5/10/1995	MONITORING WELL - AMBIENT MONITORING	723.22	16.3	706.92	570.92		Bavarian Trucking Co Inc	Solid Waste	
80026544	38.90278	-84.8417	Rising Sun	Boone	11/1/1993	MONITORING WELL - AMBIENT MONITORING	540	80	460	324		Cincinnati Gas & Electric	Solid Waste	
80026544	38.90278	-84.8417	Rising Sun	Boone	11/1/1993	MONITORING WELL - AMBIENT MONITORING	540	80	460	324		Duke Energy Kentucky Inc	Solid Waste	
80026545	38.90056	-84.8419	Rising Sun	Boone	10/13/1995	MONITORING WELL - AMBIENT MONITORING	475	41	434	298		Cincinnati Gas & Electric	Solid Waste	
80026545	38.90056	-84.8419	Rising Sun	Boone	10/13/1995	MONITORING WELL - AMBIENT MONITORING	475	41	434	298		Duke Energy Kentucky Inc	Solid Waste	
80026547	38.90417	-84.8444	Rising Sun	Boone	10/17/1995	MONITORING WELL - AMBIENT MONITORING	520	80.5	439.5	303.5		Cincinnati Gas & Electric	Solid Waste	
80026547	38.90417	-84.8444	Rising Sun	Boone	10/17/1995	MONITORING WELL - AMBIENT MONITORING	520	80.5	439.5	303.5		Duke Energy Kentucky Inc	Solid Waste	
80026549	38.90194	-84.8292	Rising Sun	Boone	10/18/1995	MONITORING WELL - AMBIENT MONITORING	470	30.5	439.5	303.5		Cincinnati Gas & Electric	Solid Waste	
80026549	38.90194	-84.8292	Rising Sun	Boone	10/18/1995	MONITORING WELL - AMBIENT MONITORING	470	30.5	439.5	303.5		Duke Energy Kentucky Inc	Solid Waste	
80029573	38.90121	-84.8476	Rising Sun	Boone	11/30/2005	MONITORING WELL - AMBIENT MONITORING		120				Cincinnati Gas & Electric	Solid Waste	
80029573	38.90121	-84.8476	Rising Sun	Boone	11/30/2005	MONITORING WELL - AMBIENT MONITORING		120				Duke Energy Kentucky Inc	Solid Waste	
80029577	38.902	-84.8484	Rising Sun	Boone	12/2/2005	MONITORING WELL - AMBIENT MONITORING		120				Cincinnati Gas & Electric	Solid Waste	
80029577	38.902	-84.8484	Rising Sun	Boone	12/2/2005	MONITORING WELL - AMBIENT MONITORING		120				Duke Energy Kentucky Inc	Solid Waste	
80029864	38.74278	-84.8358	Glencoe	Gallatin	5/29/1996	MONITORING WELL - AMBIENT MONITORING	680	7.5	672.5	536.5		Glencoe Carry-out	UST	
80029865	38.74278	-84.8358	Glencoe	Gallatin	5/29/1996	MONITORING WELL - AMBIENT MONITORING	680	12	668	532		Glencoe Carry-out	UST	
80029872	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	15	665	529		Glencoe Carry-out	UST	
80029873	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	13	667	531		Glencoe Carry-out	UST	
80029874	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	23	657	521		Glencoe Carry-out	UST	
80029875	38.74278	-84.8358	Glencoe	Gallatin	6/7/1996	MONITORING WELL - AMBIENT MONITORING	680	30	650	514		Glencoe Carry-out	UST	
80030354	38.74278	-84.8358	Glencoe	Gallatin	6/19/1996	MONITORING WELL - AMBIENT MONITORING	680	30	650	514		Glencoe Carry-out	UST	
80030355	38.74278	-84.8358	Glencoe	Gallatin	6/19/1996	MONITORING WELL - AMBIENT MONITORING	680	18	662	526		Glencoe Carry-out	UST	
80030356	38.74278	-84.8358	Glencoe	Gallatin	6/20/1996	MONITORING WELL - AMBIENT MONITORING	680	43	637	501		Glencoe Carry-out	UST	
80030955	38.74222	-84.8347	Glencoe	Gallatin	9/4/1996	MONITORING WELL - AMBIENT MONITORING	690	25	665	529		Glencoe Carry-out	UST	
80030956	38.74222	-84.8347	Glencoe	Gallatin	9/4/1996	MONITORING WELL - AMBIENT MONITORING	690	25	665	529		Glencoe Carry-out	UST	
80032432	38.86667	-84.6483	Verona	Boone	7/12/1999	MONITORING WELL - AMBIENT MONITORING	840	23.7	816.3	680.3		Bavarian Trucking Co Inc	Solid Waste	
80032433	38.86667	-84.6483	Verona	Boone	7/12/1999	MONITORING WELL - AMBIENT MONITORING	831	30.5	800.5	664.5		Bavarian Trucking Co Inc	Solid Waste	
80035870	38.74194	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	700	30.5	669.5	533.5		Glencoe Carry-out	UST	
80035879	38.74222	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	690	6	684	548		Glencoe Carry-out	UST	
80035880	38.74222	-84.8347	Glencoe	Gallatin	11/9/1998	MONITORING WELL - AMBIENT MONITORING	690	7	683	547		Glencoe Carry-out	UST	
80037728	38.88611	-84.7522	Rising Sun	Boone	7/16/2004	MONITORING WELL - AMBIENT MONITORING	460					Kentucky State Parks		
80038750	38.74278	-84.8358	Glencoe	Gallatin	1/12/2000	MONITORING WELL - AMBIENT MONITORING	680	20.2	659.8	523.8		Glencoe Carry-out	UST	
80039695	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST	
80039696	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST	
80039697	38.77111	-84.9311	Florence	Gallatin	5/24/2000	MONITORING WELL - AMBIENT MONITORING	460	15.5	444.5	308.5		Dans Marina	UST	
80040053	38.77556	-84.9156	Florence	Gallatin	9/29/2000	MONITORING WELL - AMBIENT MONITORING	490	139	351	215		Warsaw Water Works		
80040054	38.78444	-84.9092	Florence	Gallatin	9/29/2000	MONITORING WELL - AMBIENT MONITORING	480	117	363	227		Warsaw Water Works		
80043988	38.74278	-84.8358	Glencoe	Carroll	10/29/2001	MONITORING WELL - AMBIENT MONITORING	680	25	655	519		Glencoe Carry-out	UST	
80044011	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	6.5	733.5	597.5		Matracia & Matracia Partnershi	UST	

AKGWA						Construction	Surface	Bottom	Delta to				
NUMBER	lat27	lon27	Quadrangle	County	Date	Primary Use	Elevation	Total Depth	Elevation	Mine Roof	Owner	Owner Business	Regulatory Program
80044012	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	10.2	729.8	593.8		Matracia & Matracia Partnershi	UST
80044013	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	9.3	730.7	594.7		Matracia & Matracia Partnershi	UST
80044014	38.87861	-84.6994	Union	Boone	12/4/2001	MONITORING WELL - AMBIENT MONITORING	740	9	731	595		Matracia & Matracia Partnershi	UST
80049181	38.76056	-84.7889	Patriot	Gallatin	5/4/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049182	38.76056	-84.7889	Patriot	Gallatin	5/3/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049185	38.76056	-84.7889	Patriot	Gallatin	5/3/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049186	38.76056	-84.7889	Patriot	Gallatin	5/4/2004	MONITORING WELL - AMBIENT MONITORING	850					Napoleon Grocery	UST
80049425	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	6	734	598		Matracia & Matracia Partnershi	UST
80049426	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	8	732	596		Matracia & Matracia Partnershi	UST
80049427	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	8.5	731.5	595.5		Matracia & Matracia Partnershi	UST
80049428	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	6.5	733.5	597.5		Matracia & Matracia Partnershi	UST
80049429	38.87861	-84.6994	Union	Boone	1/5/2004	MONITORING WELL - AMBIENT MONITORING	740	4	736	600		Matracia & Matracia Partnershi	UST
80050961	38.85639	-84.6669	Verona	Boone	11/9/2005	MONITORING WELL - AMBIENT MONITORING	800					Bavarian Trucking Co Inc	Solid Waste
80053954	38.90083	-84.8369	Rising Sun	Boone	9/20/2007	MONITORING WELL - AMBIENT MONITORING		45				Duke Energy Kentucky Inc	Solid Waste
80053955	38.90389	-84.8369	Rising Sun	Boone	9/18/2007	MONITORING WELL - AMBIENT MONITORING		117.5				Duke Energy Kentucky Inc	Solid Waste

# Exhibit 6C

## Sterling Materials – Verona, KY

### Underground Cross Section



**Pencil Cave Bentonite Seam**  
 Thickness:  $\approx 18''$   
 Elevation: +266'



**Mud Cave Bentonite Seam**  
 Thickness:  $\approx 24''$   
 Elevation: +247'

+500' (Top of Slope Elevation)  
 +393' (Mine Entrance Elevation)

Surface Varies from 500' to 800'

Gypsum – Delivery Shaft

+266' – Pencil Cave Bentonite Seam Elevation

+247' – Mud Cave Bentonite Seam Elevation  
 +136' (Avg Level 1 Ceiling Elevation)

1<sup>st</sup> Level

+86' (Avg Level 1 Floor Elevation)

+28' (Avg Level 2 Ceiling Elevation)

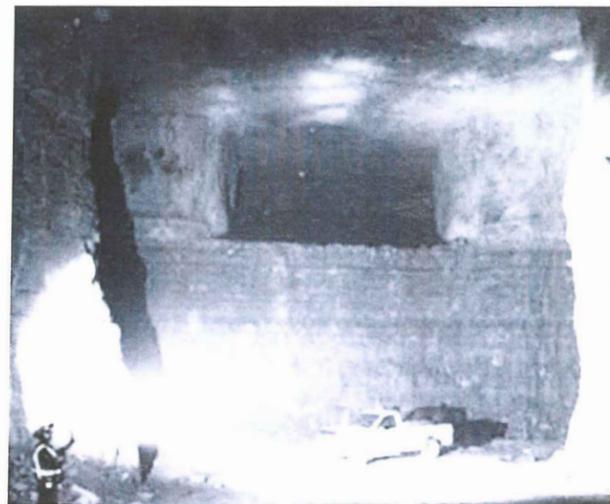
2<sup>nd</sup> Level

+2' (Avg Level 1 Floor Elevation)

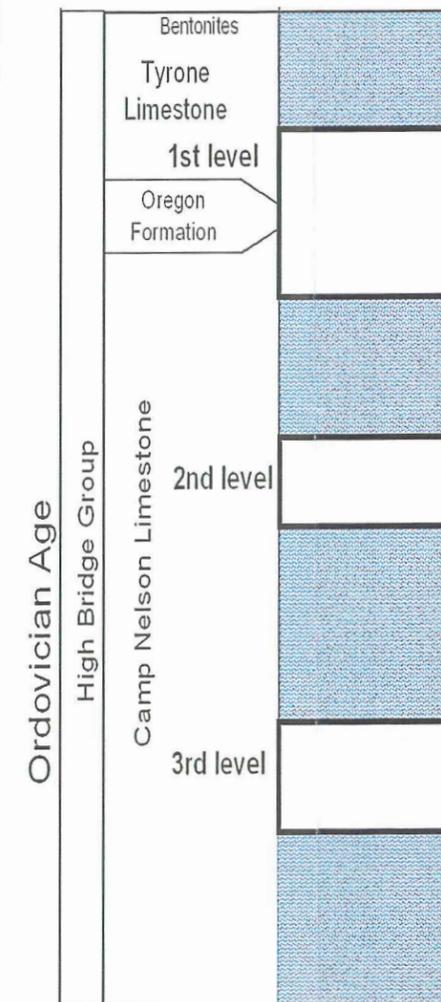
-149' (Avg Level 3 Ceiling Elevation)

3<sup>rd</sup> Level

-182' (Avg Level 1 Floor Elevation)



Interior Mine Photo: Typical Storage Area



- Notes:
- ❖ Drawing Not to Scale.
  - ❖ Mine ceiling and floor elevations are based on average elevations across each level.
  - ❖ Bentonite Seam and Rock Stratigraphy Information Resource: Kentucky Geological Survey, University of Kentucky, Lexington Series X, 1974. High Carbonate Rock in the High Bridge Group (Middle Ordovician), Boone County, Kentucky. Author: Garland R. Dever, Jr.
  - ❖ Elevations are referenced at Sea Level.



**KENTUCKY UTILITIES COMPANY  
LOUISVILLE GAS AND ELECTRIC COMPANY**

**First Data Request for Information to Sterling Ventures, LLC**

**Dated July 2, 2015**

**Case No. 2015-00194**

**Question No. 21**

**Witness: Caryl M. Pfeiffer/Counsel**

Q-21. With respect to the Synthetic Materials (“Synmat”) contract, please answer the following. Please provide copies of all equipment specifications, calculations, work 10 papers, spreadsheets and any other supporting documents, used in support of your responses.

...

- i. Has the Company investigated or had discussions with Synmat or any other party as to whether anticipated closings of coal-fired power plants and/or the conversion of coal-fired power plants to natural gas will have an impact on future demand for gypsum and/or fly ash from Ghent or Trimble County. If so, please provide all e-mails, correspondence, PVRR analyses, spreadsheets, documentation, internal or external presentations, business cases, forecasts and any other information prepared, reviewed or discussed with respect to anticipated future demand.

A-21. **ORIGINAL RESPONSE**

- i. General discussions have taken place on what impact plant closings could have on the marketability of by-product; however, no conclusive action has taken place. Concerning documents responsive to this request, see attached. Counsel for the Companies is continuing to undertake a reasonable and diligent search for other such documents and will reasonably supplement this response no later than Monday July 20, 2015.

**SUPPLEMENTAL RESPONSE**

- i. No additional responsive documents were found.

**KENTUCKY UTILITIES COMPANY  
LOUISVILLE GAS AND ELECTRIC COMPANY**

**First Data Request for Information to Sterling Ventures, LLC**

**Dated July 2, 2015**

**Case No. 2015-00194**

**Question No. 28**

**Witness: John N. Voyles/R. Scott Straight**

Q-28. Exhibit S attached to Sterling's Complaint is a PVRR calculation for Sterling's proposal to use an industrial site with an existing barge permit on the northern edge of Warsaw, Kentucky approximately 9 miles south of Sterling's mine as a site for a barge unloading facility (the "Warsaw barge site"). Attached to Exhibit S are the assumptions on which the PVRR calculation is based (the "Support Document").

- a. Attached as Attachment A to this Data Request is details of the barge site Sterling referred to in its emails to Scott Straight on December 5th, December 11th and December 30th of 2014.

...

- ii. Please provide copies of all e-mails, correspondence, PVRR analyses, spreadsheets, documentation, internal or external presentations, business cases and any other information prepared and reviewed or discussed with respect to the option of using the Warsaw barge site in connection with Sterling's proposal for beneficial use of Trimble County's CCR.

A-28 **ORIGINAL RESPONSE**

- a. ii. See the attached documents. Counsel for the Companies is continuing to undertake a reasonable and diligent search for other such documents and will reasonably supplement this response no later than Monday, July 20, 2015.

Certain documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Companies will file no later than Monday, July 20, 2015, a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

**SUPPLEMENTAL RESPONSE**

- a. ii. See the attached documents.

Certain documents responsive to this request are not being provided because they contain communications with counsel and the mental impressions of counsel, which information is protected from disclosure by the attorney-client privilege and the work product doctrine. The Companies are filing contemporaneously herewith a privilege log describing the responsive documents the Companies are not producing on the ground of attorney-client or work product privilege.

**From:** John Walters(johnwalters@sterlingventures.com)  
**To:** Straight, Scott  
**CC:**  
**BCC:**  
**Subject:** Sterling Ventures alternative to Trimble County Landfill  
**Sent:** 12/30/2014 12:25:31 PM -0500 (EST)  
**Attachments:**

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Scott

I have not heard anything in response to my December 11 e-mail asking if LG&E would like to sit down and talk about the options and logistical issues of barging CCRs to our facility as an alternative to the building the new Trimble County Landfill. Is this an alternative that LG&E wants to explore?

John

John W. Walters, Jr.  
Sterling Ventures, LLC  
376 South Broadway  
Lexington, KY 40508  
Phone (859) 259-9600  
Fax (859) 259-9601

[johnwalters@sterlingventures.com](mailto:johnwalters@sterlingventures.com)

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