ENVIRONMENTAL MANAGEMENT SERVICES, INC.

December 21, 2016

Mr. Brian Hocutt
Cooperative Energy
P.O. Box 15849
Hattiesburg, MS 39402

Re: CCR Impoundments – Placement Above Uppermost Aquifer
R.D. Morrow, Sr. Generating Station
Purvis, Lamar County, Mississippi

Dear Mr. Hocutt:

Cooperative Energy (formerly South Mississippi Electric Power Association) retained Environmental Management Services, Inc. (EMS) to evaluate Cooperative Energy's compliance with the Federal Coal Combustion Residuals Rule (CCR Rule) requirements in accordance with 40 CFR 257.60 which states:

> "*(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including seasonal high water table).*"

Cooperative Energy has two existing CCR surface impoundments including: 1) the Emergency Scrubber Surge Pond, and 2) the Scrubber Supply Pond.

§257.60 Placement Above the Uppermost Aquifer

The vertical separation between the CCR impoundment liner and the uppermost water bearing zone identified during the installation of monitoring wells MWI-1 through MWI-4 and during subsequent water level monitoring events greatly exceeds the minimum required 1.52 meters (five feet) of vertical separation by §257.60(a). Supporting information including boring logs with monitor well construction details is attached.

P. O. Box 15369 (39404) • 7350 Highway 98 • Hattiesburg, MS 39402
Phone (601)544-3674 • Fax (601) 544-0504 • www.env-mgt.com

Engineer's Certification

I hereby certify, as a Professional Engineer in the State of Mississippi, that the information in this document was assembled under my direct personal charge and that this determination was conducted in accordance with and meets the requirements of 40 CFR Part 257.60(a).

Christopher Taylor Johnson, P.E.
Mississippi Professional Engineer No. 15761

Date: 12/21/2016

CHRISTOPHER T. JOHNSON
LICENSED PROFESSIONAL
ENGINEER
AND
SURVEYOR
12/21/2016
PE-15761
PS-9129
STATE OF MISSISSIPPI

Geologist's Certification

I have reviewed the portions of this report having to do with geology in sufficient depth to accept full responsibility for those contents.

Kenneth D. Ruckstuhl, RPG
MS Professional Geologist No. 0090

Date: 12/21/2016

REGISTERED PROFESSIONAL GEOLOGIST
MS
0090
KENNETH D. RUCKSTUHL

Attachment - Boring Logs

File: Placement Above Uppermost Aquifer

Attachment

Project No.:	SOU2-16-001	Latitude:	31.215925	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395214	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	259.37	Driller:	WHE
Date:	3-22-16	Total Depth (ft. bls)	60.0	Checked By:	KDR

Boring No.: MWI-1

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

SUBSURFACE PROFILE			SAMPLE		Well Completion Details
Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)	
		Ground Surface			
0		6" Asphalt			
		Reddish brown CLAYEY GRAVEL (CLG)			
		Brown SILTY CLAY (CL-ML)			
5		Gray CLAY (CH) with red and brown streaking			
		Gray stiff CLAY (CH)			
10					
15		2" Gray SILTY CLAY (CL-ML)			
		Gray stiff CLAY (CH)			
		Gray SILTY CLAY (CL-ML)			
		Gray stiff CLAY (CH)			
20		Gray stiff CLAY (CH) with brown streaking			
25		Gray-green stiff CLAY (CH) with red streaking			
		Gray-green stiff CLAY (CH) with brown streaking			
30		Gray-green stiff CLAY (CH) with red and brown streaking			
		Gray-green stiff CLAY (CH)			
35					

1.0'

34.0'

NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16

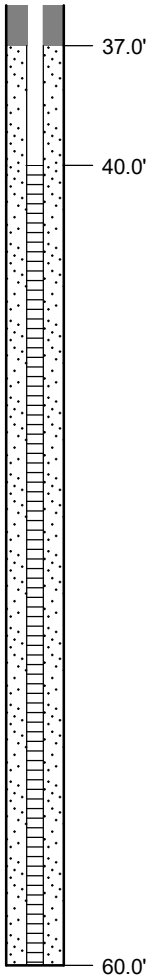
Project No.:	SOU2-16-001	Latitude:	31.215925	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395214	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	259.37	Driller:	WHE
Date:	3-22-16	Total Depth (ft. bls)	60.0	Checked By:	KDR

Boring No.: MWI-1

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		Gray-green stiff CLAY (CH) *(Continued)*		
		Gray-green stiff CLAY (CH) with brown streaking		
40		Gray-green medium soft CLAY (CH)		
		Gray-green medium soft CLAY (CH) with silt		
45		Gray-green soft SILTY CLAY (CL-ML) with brown streaking - medium soft 45' - 45.5' - soft below 45.5'		
		Brown saturated SILT (ML)		
		Brown and gray soft SILTY CLAY (CL-ML)		
		Brown and gray-green CLAY (CH)		
		Firm brown CLAY (CH)		
50		- Soft below 49.8'		
		Brown saturated SILT (ML)		
		Soft brown CLAYEY SILT (CL-ML)		
		Firm green CLAY (CH) with brown streaking		
		BORING SAMPLED TO 54'		
55				
60		**SET WELL AT 60'**		
65				
70				

Well Completion Details



NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16

Project No.:	SOU2-16-001	Latitude:	31.214289	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395711	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	255.27	Driller:	WHE
Date:	3-23-16	Total Depth (ft. bls)	60.0	Checked By:	KDR

Boring No.: MWI-2

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		SUBSURFACE PROFILE	**SAMPLE**	
0		Ground Surface		
		Saturated organic SILTY SAND (SM)		
		Brown SILTY CLAY (CL-ML)		
5				
		Dark gray fine SANDY CLAY (SC)		
		Soft brown medium SAND (SW)		
10				
		Medium brown SANDY CLAY (SC)		
		Soft brown medium SAND (SW)		
		Soft gray CLAY (CH) with silt		
15				
		CLAY (GC) with gravel		
		Soft gray CLAY (CH) with silt, brown streaking		
		CLAY (GC) with gravel		
		Brown SILTY CLAY (CL-ML) with black inclusions, red and gray streaking		
20		Firm gray CLAY (CH) with orange, black and red streaking		
		Firm brown CLAY (CH) with gray streaking		
25				
		Firm gray CLAY (CH) with orange and brown streaking		
		Firm gray CLAY (CH)		
30				
		Firm orange CLAY (CH) with black streaking		
		Firm gray CLAY (CH)		
		Firm gray-green CLAY (CH)		
35				

Well Completion Details

0.0'

34.0'

NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16

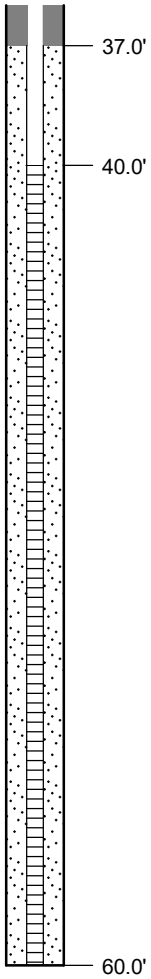
Project No.:	SOU2-16-001	Latitude:	31.214289	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395711	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	255.27	Driller:	WHE
Date:	3-23-16	Total Depth (ft. bls)	60.0	Checked By:	KDR

Boring No.: MWI-2

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		Firm gray-green CLAY (CH) with orange and black streaking		
		Firm gray-green CLAY (CH) with orange streaking		
40				
		Firm gray-green CLAY (CH) with silt and orange streaking		
45				
		Saturated gray SILT (ML)		
		Soft gray-green SILTY CLAY (CL-ML)		
		Saturated gray SILT (ML)		
50		Gray SILTY CLAY (CL-ML) with brown streaking		
		Saturated brown SILTY fine SAND (SM)		
		Gray SILT (ML) with clay		
		Gray SILT fine SAND (SM)		
		Firm gray-green CLAY (CH) with brown streaking		
		BORING SAMPLED TO 54'		
55				
60		**SET WELL AT 60'**		
65				
70				

Well Completion Details



Project No.:	SOU2-16-001	Latitude:	31.214361	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395292	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	258.28	Driller:	WHE
Date:	3-23-16	Total Depth (ft. bls)	76.0	Checked By:	KDR

Page: 1 of 3

Boring No.: MWI-3

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		SUBSURFACE PROFILE	**SAMPLE**	
0		Ground Surface		
		Brown to tan fine to medium SAND (SW)		
10		Brown, orange and gray SANDY CLAY (SC)		
		Firm red, orange and gray SILTY CLAY (CL-ML)		
15		SILTY CLAY (CL-ML) with gravel		
		Firm gray, orange and red CLAY (CH)		
		Firm gray-green CLAY (CH)		
		- 2" soft layer at 19'		
20		- brown streaking 20' - 28'		
25		- orange streaking 28' - 34'		
30				
		Firm gray-green SILTY CLAY (CL-ML)		
35				

Well Completion Details

0.0'

NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16

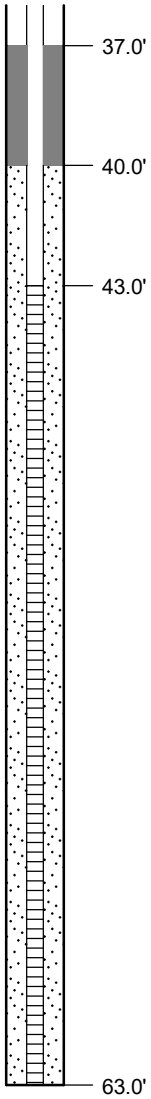
Project No.:	SOU2-16-001	Latitude:	31.214361	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395292	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	258.28	Driller:	WHE
Date:	3-23-16	Total Depth (ft. bls)	76.0	Checked By:	KDR

Boring No.: MWI-3

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		Gray-green CLAY (CH) *(Continued)*		
		- with silty clay inclusions at 37'		
		Gray-green CLAY (CH) with some silt, orange and red streaking		
40		Gray CLAY (CH) with red streaking		
		Firm gray CLAY (CH) with brown streaking		
45		Firm gray-green CLAY (CH) with brown streaking		
50		Firm brown CLAY (CH) with gray streaking		
55				
60				
		Medium brown firm CLAY (CH) with gray streaking		
65		Dark brown CLAY (CH) with black inclusions		
		Light brown CLAYEY SILT (CL-ML)		
		Gray CLAY (CH) with brown streaking		
		SILT (ML) pocket with green color surrounding		
		Soft gray CLAY (CH) with brown silt pockets		
70		Slightly moist soft gray CLAY (CH)		

Well Completion Details



NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16

Project No.:	SOU2-16-001	Latitude:	31.214361	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.395292	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	258.28	Driller:	WHE
Date:	3-23-16	Total Depth (ft. bls)	76.0	Checked By:	KDR

Boring No.: MWI-3

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

SUBSURFACE PROFILE			SAMPLE		Well Completion Details
Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)	
75		Slightly moist soft gray CLAY (CH) *(Continued)*			
		BORING TERMINATED AT 76' **SET WELL AT 63'**			
80					
85					
90					
95					
100					
105					

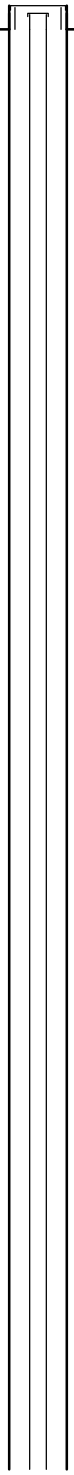
Project No.:	SOU2-16-001	Latitude:	31.214433	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.394908	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	265.96	Driller:	WHE
Date:	3-24-16	Total Depth (ft. bls)	70.0	Checked By:	KDR

Boring No.: MWI-4

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		Ground Surface		
0		Organic SILTY SAND (SM)		
5		Firm orange CLAY (CH) with gray, brown and red streaking		
		Brown SILTY CLAY (CL)		
		Brown SILTY SAND (SM)		
10		Firm orange SILTY CLAY (CL-ML) with gray streaking		
		Firm orange CLAY (CH) with gray and red streaking		
		Firm gray CLAY (CH) with red streaking		
15				
20				
		Firm gray-green CLAY (CH) with red and orange streaking		
25				
		Gray saturated SILT (ML)		
		Firm gray CLAY (CH) with brown streaking		
		Gray SILT fine SAND (SM)		
		Firm brown CLAY (CH) with gray streaking, 2" saturated silty clay lens		
30		Firm brown CLAY (CH) with gray and black streaking		
		Firm gray CLAY (CH) with brown and black streaking		
		Firm brown CLAY (CH) with gray and black streaking		
35				

SUBSURFACE PROFILE | SAMPLE | Well Completion Details



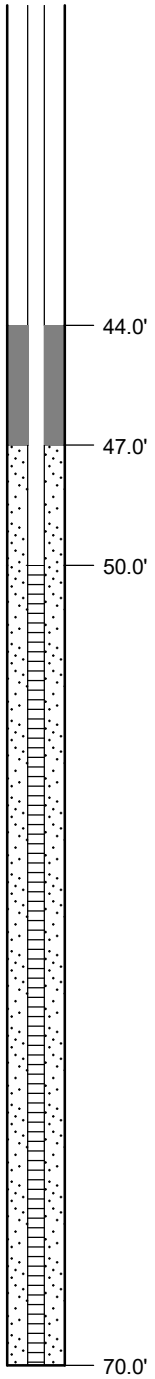
Project No.:	SOU2-16-001	Latitude:	31.214433	Geologist:	JVS
Project:	SMEPA	Longitude:	-89.394908	Drill Method:	Hollow Stem
Location:	Purvis, MS	Grd. Elev:	265.96	Driller:	WHE
Date:	3-24-16	Total Depth (ft. bls)	70.0	Checked By:	KDR

Boring No.: MWI-4

ENVIRONMENTAL MANAGEMENT SERVICES, INC.
600 N. 26TH AVE
HATTIESBURG, MS 39401

Depth (ft.)	Symbol	Description / Unified Soil Classification	Lab Sample No.	PID (ppm)
		SUBSURFACE PROFILE	**SAMPLE**	
40		Firm gray CLAY (CH) with brown streaking		
		4" red and green layered brittle CLAYEY SILT (CL-ML) 4" gray-green firm CLAY (CH) 2" red and gray layered brittle CLAYEY SILT (CL-ML)		
		Firm gray-green CLAY (CH) with clayey silt inclusions		
45		Gray firm CLAY (CH) with red streaking		
50		- brown streaking below 50'		
55		- firm, with gray streaking below 56'		
60		**BORING SAMPLED TO 62'**		
65				
70		**SET WELL AT 70'**		

Well Completion Details



NEW WELL PID SMEPA LOGS.GPJ ENV MANAGEMENT.GDT 13/7/16