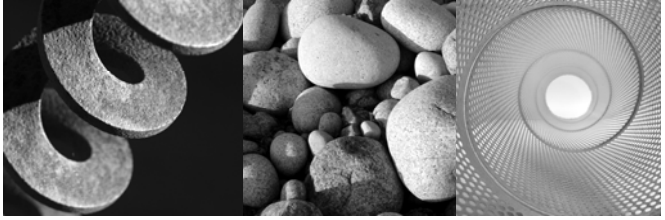


GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Comments On:

Specific Site Assessment for Coal Ash Impoundments at Arizona Public Service (APS) Four Corners Power Plant

Lined Ash Impoundment

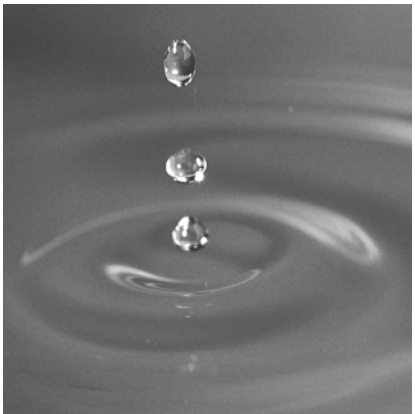
Lined Decant Water Impoundment

Fruitland, New Mexico

Submitted to:
Lockheed-Martin Corporation
2890 Wood Bridge Avenue
Building 209 BAYF
Edison, NJ 08837

Submitted by:
GEI Consultants, Inc.
6950 South Potomac Street, Suite 300
Centennial, CO 80112

June 2009
Project 091330



Stephen G. Brown, P.E.
Senior Project Manager

EPA's Comments

From: "Killeen, Deborah A" <deborah.a.killeen@lmco.com>
To: "Stephen G. Brown" <sbrown@geiconsultants.com>
CC: "Miller, Dennis A" <dennis.a.miller@lmco.com>, <Hoffman.Stephen@epamail....
Date: 7/9/2009 11:29 AM
Subject: Site 20 - Four Corners Draft Final Report

Steve,

I received two comments on the draft final report for this site from Steve Hoffman. Please include the date of the assessment up front in Section 1.1 and please define "OSE" in Section 2.7. I will be sending instructions shortly on what is necessary for final versions of the reports.

Deb

Deborah A Killeen

Quality Assurance Officer

Lockheed Martin/REAC

732-321-4245 (office)

609-865-9308 (cell)

732-494-4021 (fax)

State's Comments

From: "Miller, Dennis A" <dennis.a.miller@lmco.com>
To: "Stephen G. Brown" <sbrown@geiconsultants.com>, "Killeen, Deborah A" <de...
CC: "Hoffman.Stephen@epa.gov" <Hoffman.Stephen@epa.gov>, "Kohler.James@epama...
Date: 9/3/2009 6:38 AM
Subject: FW: State Comments on GEI Report to USEPA for APS LAI and LDWI Dams

Steve: Please address the state comments given below for the assessment report for the Arizona Public Service CCW impoundments.

Thank You.

-----Original Message-----
From: Kohler.James@epamail.epa.gov [mailto:Kohler.James@epamail.epa.gov]
Sent: Thursday, September 03, 2009 8:29 AM
To: Miller, Dennis A; Killeen, Deborah A
Cc: Hoffman.Stephen@epamail.epa.gov
Subject: State Comments on GEI Report to USEPA for APS LAI and LDWI Dams

Dear Dennis and Deb,

Please see state comments below. We have reviewed the comments and believe they are limited to factual/editorial issues. They should be verified and incorporated accordingly.

If you have any questions or concerns with these directions please feel free to call me or Steve. Thanks!

Jim

****
Jim Kohler, P.E.
Environmental Engineer
LT, U.S. Public Health Service
U.S. Environmental Protection Agency
Office of Resource Conservation and Recovery
Phone: 703-347-8953
Fax: 703-308-8433
****

----- Forwarded by James Kohler/DC/USEPA/US on 08/31/2009 01:54 PM -----
|---------->
| From: |
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|"Chaudhary, Sushil K, OSE" <SushilK.Chaudhary@state.nm.us>
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|---------->
| To: |
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|James Kohler/DC/USEPA/US@EPA

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|---------->
| Cc: |
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>----------|
|"Pacheco, Elaine, OSE" <elaine.pacheco@state.nm.us>
|

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|---------->
| Date: |
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|08/31/2009 01:49 PM
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|---------->
| Subject: |
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|RE: Comments on GEI Report to USEPA for APS LAI and LDWI Dams
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Jim,
I appreciate the opportunity for review and comment on the Report by GEI Consultants for Arizona Public Service (APS) Lined Ash Impoundment and Lined Decant Water Impoundment Dams. I agree with the general content of the report, but I have not attempted to verify the findings of GEI Consultants. The Dam Safety Bureau will consider verifying the findings of GEI Consultants during routine inspections of the dams and will recommend appropriate corrective measures to APS at that time. We will appreciate a copy of the final report.

While reading through the report, the following typos were found and should be corrected:

Section 5.1.3 - "Five vibrating..." should be "Six vibrating..."

Section 5.2.2 - "NM SEO" should be "NM OSE"

Section 6.2, First Paragraph - "New Mexico Dam Safety Division" should be "New Mexico Dam Safety Bureau"

Section 7.2 First Sentence - "NM DWR" should be "NM OSE"

Thanks

Sushil K. Chaudhary, D.Eng., P.E.
Dam Safety Bureau
Office of the State Engineer
P.O. Box 25102
Santa Fe, NM 87504-5102
Tel. 505-827-6136
Fax 505-827-6068
sushilk.chaudhary@state.nm.us
http://www.ose.state.nm.us

-----Original Message-----
From: Kohler.James@epamail.epa.gov [mailto:Kohler.James@epamail.epa.gov]

Sent: Tuesday, August 25, 2009 3:01 PM
To: Chaudhary, Sushil K, OSE
Cc: Danielson, Bryan, OSE; Pacheco, Elaine, OSE
Subject: RE: Fwd: Tri-State Escalante Report

Excellent, thank you Sushil.

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| From: |
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|"Chaudhary, Sushil K, OSE" <SushilK.Chaudhary@state.nm.us>
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| To: |
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|James Kohler/DC/USEPA/US@EPA
|

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|---------->
| Cc: |
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|"Danielson, Bryan, OSE" <Bryan.Danielson@state.nm.us>, "Pacheco,
Elaine, OSE" <elaine.pacheco@state.nm.us>

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|---------->
| Date: |
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|08/25/2009 04:36 PM
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|---------->
| Subject: |
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|RE: Fwd: Tri-State Escalante Report
|

>----------|

Jim, I will try to review APS LAI and LDWP Report and provide you comments by 8/31.

Thanks,

Sushil K. Chaudhary, D.Eng., P.E.
Dam Safety Bureau
Office of the State Engineer
P.O. Box 25102
Santa Fe, NM 87504-5102
Tel. 505-827-6136
Fax 505-827-6068
sushilk.chaudhary@state.nm.us
http://www.ose.state.nm.us

-----Original Message-----
From: Danielson, Bryan, OSE
Sent: Tuesday, August 25, 2009 1:47 PM
To: Chaudhary, Sushil K, OSE
Subject: FW: Fwd: Tri-State Escalante Report

Sushil,

FYI, I understand you've got this one.

Bryan

-----Original Message-----
From: Kohler.James@epamail.epa.gov [mailto:Kohler.James@epamail.epa.gov]
Sent: Monday, August 24, 2009 7:26 AM
To: Danielson, Bryan, OSE
Subject: Re: Fwd: Tri-State Escalante Report

Bryan,

Thanks for the review. Can you have Sushil call me about the Four Corners report? In order to incorporate his comments we would need them sooner (i.e. by 8/31). They want these publicly posted ASAP. Thanks again-

Jim

****
Jim Kohler, P.E.
Environmental Engineer
LT, U.S. Public Health Service
U.S. Environmental Protection Agency
Office of Resource Conservation and Recovery
Phone: 703-347-8953
Fax: 703-308-8433
****

Arizona Public Service's Comments

THE POWER TO MAKE IT HAPPEN℠

Four Corners Power Plant
P. O. Box 355
Mail Station 4900
Fruitland, NM 87416-0355
Fax No.: (505) 598-8339

August 7, 2009

Mr. Stephen Hoffman
Office of Resource Conservation and Recovery (5304P)
U.S. Environmental Protection Agency 1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Dear Mr. Hoffman,

RE: APS Response - Arizona Power Four Corners Draft Coal Combustion Waste Report

Thank you for the opportunity to review and comment on the "Draft Report – Specific Site Assessment for Coal Ash Impoundments" for our Lined Ash Impoundment (LAI) and Lined Decant Water Pond (LDWP) prepared by GEI. In keeping with your request, we have reviewed the report and offer the attached comments for your consideration. Our comments help to clarify and correct items discussed in the GEI draft report. Please note that APS agrees with the report's final recommendations and will work to continue the safe operation of our ash disposal facilities.

Again, thanks for the opportunity to review and comment on the report.

Sincerely,

David L. Saliba, Plant Manager
FOUR CORNERS POWER PLANT

Attachments

BE610 / 423.24

APS Comments on Geological Engineers Inc Draft Report

Specific Site Assessment for Coal Ash Impoundments at Arizona Public Service (APS)
Four Corners Power Plant
Lined Ash Impoundment
Lined Decant Water Impoundment
Fruitland, NM
Dated June 2009

Page 1, Section 1.1
General Comment – Please note that the Lined Decant Water Pond (LDWP) is referred to by GEI as the Lined Decant Water Impoundment (LDWI) throughout the text of the document. All APS documentation uses (LDWP). This may be confusing to anyone referencing both GEI and APS documents in the future.

Page 4, Table 2.1
The LDWP crest is actually about 5488 feet long, not 3094 feet as indicated in the table.

Page 5, Section 2.7, 1st Paragraph, Last sentence
The LAI and LDWP have only been in service for about 5 years (2004-2009). APS suggests that the sentence should read as follows. "There have been no known spills or unpermitted releases for any of the ash ponds at the facility."

Page 9, Section 5.1.3, 1st Paragraph, 1st sentence
There are six vibrating wire piezometer groups, not five as written in the sentence. The table 5.1 is correct showing all 6 groups.

Page 10, Section 5.1.3, 1st Paragraph on page, 2nd sentence
The sentence should reference Table 5.2, not Table 3.

Page 10, Section 5.2.2, 1st Paragraph, 3rd sentence
The sentence should read ….every 6 months to the NM OSE. The use of SEO is a typo.

Page 11, Section 5.3.1, 1st Paragraph, (also applies to sections 6.2.3, 6.4.4, & 11.1.1)
General Comment - Moisture at the toe of the south embankment of the LAI – Seepage at the toe of the south embankment of the Lined Ash Impoundment (LAI) is mentioned in several places in the GEI draft report. APS believes this moisture is drainage from the bottom ash material placed as embankment fill during construction, and not seepage from the Pond 4 impounded fly ash behind the embankment. Since optimum moisture content, as determined by ASTM D698 for the bottom ash material, runs from approximately 30% to 45% by weight of solids, the bottom ash is delivered to the embankment fill at approximately 40% moisture. This bottom ash is very free draining and the delivered moisture drains away rapidly. APS believes that the moisture at the toe of the south embankment is drainage from the bottom ash construction water. This is validated by historical observations. When bottom ash construction in this area stops, the water dries out. In fact, the area on the south embankment is now dry as of this writing since bottom ash construction in the area has not occurred for several weeks. Even so, APS will continue to monitor the toe of the south embankment for evidence of seepage that might indicate seepage from the Pond 4 impoundment fly ash as a precaution.

Page 11, Section 5.3.1, 2nd Paragraph, 3rd sentence
The statement that the data shows a vertical movement of 0 to 2.5 feet is not correct. The referenced data actually shows vertical movement of 0 to 7 inches. Further, since the settlement plates in question have not been covered with construction material yet, APS has verified with a GPS survey that the plates have actually only moved about 1 inch. Once the plates are covered with material, they are expected to perform properly. APS will test the plates performance before they are covered with construction material.

Page 13, Section 6.2.5, (also applies to sections 8.8.3, 8.7, & 12.1.2) This is a report recommendation.

General Comment – Drop Inlet Structure LAI outlet works – During the initial materials review and analysis APS had Performance Pipe, a division of Chevron Phillips Chemical Company, perform materials calculations for the sizing and HDPE class specification for the outlet structure. APS believes the structure is properly designed. Even so, APS agrees to revisit these calculations documenting different water loadings, internal and external load conditions, and evaluate the effect of the seepage penetrations in the structure.

Page 16, Section 6.4.4, last sentence (also applies to section 12.1.1) This is a report recommendation.

The tamarisk trees are growing at the down stream toe of the west embankment, not the south embankment as stated in the sentence. General comment – It should be noted that the subject tamarisk trees are also on the bank of the old ash pond #6 seepage trench (which is now dry). The pond #3 toe and pond #6 trench are adjacent to each other. APS will remove the tamarisk trees this summer and monitor to ensure the west embankment has no seepage.

Page 22, Section 8.5.2 (also applies to sections 8.5.2, 8.8.2, 11.1.2, 12.1.1, & 12.4) This is a report recommendation.

General Comment – Lined Decant Water Pond (LDWP) steady-state seepage slope stability factor of safety – The APS and URS reported factor of safety for the west embankment of the LDWP is 1.4 static conditions. This factor of safety met requirements for slope stability calculation at the time of permitting and construction of the LDWP. APS agrees with GEI's statement about fully saturated fly ash contained in pond 3 as quoted in the last paragraph of the section of their report. ("*It is reasonable to analyze the dam assuming full steady-state conditions in the clay embankment, but only partial depth saturation of the underlying fly ash. In this revised case, the factor of safety would be nearly 1.9 and would meet both the New Mexico OSE and FERC minimum factor of safety for static steady seepage of 1.5*.") Reducing the saturated height of fly ash does increase the steady-state seepage factors of safety. Even so, APS will reevaluate these factors of safety and seepage conditions as recommended in the GEI report.

Page 27, Section 11.1.1, (also applies to section 12.1.1) This is a report recommendation.

General Comment – Uneven dam crest on LDWP – APS agrees with the need to perform maintenance work on the crest of the embankment to prevent wind erosion. Prior to the GEI inspection APS had committed to the NM OSE to add a road base material to the top of the embankment to prevent wind erosion. This work will be completed this year.