Department of Energy

Environmental Management
Consolidated Business Center
250 East 5th Street, Suite 500
Cincinnati, Ohio 45202
(513) 246-0500

JUL 24 2007

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

EMCBC-00611-07

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

On-Site Disposal Facility (OSDF) Cell 7 and 8 Surface

As a result of a December 18, 2006 quarterly routine On-site Disposal Facility (OSDF) inspection, both U.S. Environmental Protection Agency (EPA) and Ohio EPA raised a concern related to the "transition" area between Cell 7 and Cell 8 and the surface of the south facing slope of Cell 8. These concerns were reviewed and evaluated, and the areas were monitored through the winter and spring. Routine maintenance was performed on the OSDF.

The maintenance that was conducted related to the areas of concern consisted of backfilling erosion rills with topsoil by hand, broadcast seeding with the OSDF seed mix, and hand mulching with straw. In addition, a portion of the Cell 8 south slope that did not appear to have adequate grass germination was broadcast seeded as well. The south slope of Cell 8 was subsequently irrigated to promote germination.

Geosyntec, the designer of the OSDF, was asked to evaluate the concerns that had been raised. As a result, Geosyntec prepared a memorandum dated December 21, 2006 that was followed up by a memorandum dated April 9, 2007 (see copy enclosed).

On June 29, 2007 a field review of the OSDF was conducted with representatives of USEPA, OEPA, Tetra Tech, Geosyntec, Fluor Daniel, Stoller, DOE-LM and DOE EM followed by a meeting to discuss the findings.

As a followup to the meeting, Dr. J.D Chiou of Fluor Daniel, who has been affiliated with the design, construction, operations and closing of the OSDF, generated an e-mail describing his overall interpretation relative to the findings (see e-mail enclosed).

Based upon the above, DOE believes the OSDF is functioning as designed. Per the requirements of the Legacy Management and Institutional Control Plan, the OSDF will continue to be monitored and maintained to insure proper performance.

If you have questions related to this letter, please feel free to contact me at 513-648-3139.

Sincerely,

Johnny Reising

Johnny Reising
Director

Enclosures

cc w/enclosures:
T. Schneider, OEPA-Dayton (three copies of enclosures)
M. Cullerton, Tetra Tech
M. Shupe, HSI GeoTrans
S. Helmer, ODH
AR Coordinator, Wanda Sumner

cc w/o enclosures:
F. Johnston, Stoller
R. Norton, Fluor

Geosyntec consultants

1255 Roberts Blvd. NW
Kennesaw, GA 30144
PH 678.202.9500
FAX 678.202.9501
www.geosyntec.com

Memorandum

Date: 9 April 2007

To: Mr. Johnny Reising, US Department of Energy

Copies to: Mr. John Homer (Stoller), Dr. J.F. Beech (Geosyntec)

From: James Fleck, PE, Geosyntec

Subject: Response to OEPA's concerns about Cell 8
Fernald Closure Project, Fernald, Ohio

STATE OF OHIO
JAMES A. FLECK
E-61801
REGISTERED PROFESSIONAL ENGINEER

INTRODUCTION

Geosyntec Consultants (Geosyntec) has prepared this memorandum as a follow-up to the Geosyntec memorandum dated 21 December 2006 which was written in response to concerns posed by Ohio Environmental Protection Agency (OEPA) following the December 18, 2006 quarterly inspection of the OSDF final covers to the Department Of Energy. That memorandum addressed two issues as follows:

1. The south side of Cell 8 cap has an undulating appearance. Why is this, and is there a stability concern due to seemingly higher potential of surface erosion?

2. Why does the west side of the OSDF between Cell 7 and Cell 8 jog out and what should be done about the erosion observed at the transition?

The Cell 7 and 8 portion of the OSDF final cover inspection was performed on 27 March 2007. A secondary meeting was conducted on the OSDF Cell 8 cap on 9 April 2007. In attendance, at the secondary meeting, were Mr. Johnny Reising, Mr. John Homer, and myself. The meeting was held to inspect and discuss the current status of the issues addressed in December 2006. The remainder of this memorandum will discuss the two issues noted above. The Background and December Recommendations sections below are as stated in the December memorandum with the current observations included in the March – April Observations sections.

UNDULATING SOUTH SLOPE

Background

The undulating appearance seen on the south side of Cell 8 was caused by the stabilizer when stabilizing topsoil just prior to seeding. Once an area is turned over for seeding, a soil stabilizer is used to break up compacted soil to prepare the seed bed. The stabilizer leaves depressions from its wheels during this activity. A tractor with a tiller attachment is then used to further prepare the soil and smooth out the depressions left by the stabilizer. The tiller is run perpendicular to the slope. For the south side of Cell 8, depressions are still present following the tiller run. This is because the good loamy topsoil that was easily compressed during the overlapping trips of the stabilizer could not be completely smoothed out by the tiller. This phenomenon has been observed on previous cells where the stabilizer worked straight up and down the slopes. In some of the previous instances, erosion occurred in these lower portions of the waves. For the south side of Cell 8, in an attempt to reduce the potential for erosion, the stabilizer was used at about a 45 degree angle along the slope to slow down any surface water following the depressions. Seeding was then conducted along the contours perpendicular to the slope. Erosion mat has been installed correctly in this area and is providing good erosion protection. Based on these observations slope instability is not developing on this slope.

From a long-term standpoint, there is no evidence that the undulating appearance is due to the final grading of the topsoil rather varying degrees of compaction caused by the soil stabilizer. The observed condition is similar to that in other cells at the end of construction and is expected to become less apparent with time as in the other cells. Actually, the current observed condition is already less apparent than what was observed at the end of October when construction was just completed.

December Recommendation

This slope was seeded late in the year (end of October). There has been significant seed germination as of December 20, 2006, but the area does not yet have a good stand of grasses to cover the entire surface. With no current evidence of erosion or stability issues, Geosyntec recommends that the area be left as-is so that a good stand of grass can grow. Any work in the area at this time of year would only create a greater potential for erosion problems. This area should be monitored in the spring, for erosion that may have occurred during the winter months. GeoSyntec will evaluate this specific issue again during the next quarterly OSDF inspection to be conducted in March 2007. If erosion occurs over the winter, it can be addressed in the spring at the start of the growing season.

March – April Observations

The vegetation on the south slope remains about the same as that indicated in December as it was either dormant or pending germination depending on the seed. Some erosion rills were observed on the south slope. These areas will need to be repaired. Overall, less erosion was observed on the south slope than other areas (west slope) that had the same amount of vegetative growth. There is no indication of an increased risk of stability or erosion on the undulating south slope of Cell 8.

Now that spring has arrived, the Cell 8 vegetation should be monitored by onsite personnel as the temperatures rise over the next few months. A follow-up inspection of the vegetation on Cell 8 would be advisable sometime in May depending on the ambient air temperatures over the next two months. This would allow time to reseed, if needed, before the dry summer months.

WEST SIDE CELL 7 TO 8 TRANSITION

Background

The original layout of the OSDF had a straight edge at the transition of Cell 7 to Cell 8. At the time of construction of Cell 8 and Valve House 8 several changes to the alignment along the west side of the OSDF in the vicinity of Cell 8 were required. These adjustments were required to account for the presence of physical site features including the alignment of the EPLTS, a major drainage ditch/culvert, underground utility lines, and the location of the former Building 82 and two associated trailers. These adjustments required that the western boundary of Cell 8 be shifted towards the east, and a corresponding grading transition between the existing edge of Cell 7 and the proposed edge of Cell 8 were required. As Cell 8 was reaching capacity, there were adjustments to the grading on the east and west to create additional air space. The east side re-grading was relatively straightforward, and only required moving out the toe of slope and relocating the east drainage ditch. The west side expansion had to address Valve House 8, a horizontal monitoring well and cleanout, and Valve House Road. The toe on the west side jogs out to account for these permanent features, to allow construction of the Cell Cap 8 according to the design while maintaining all design constraints and requirements, and to maintain a 6H:1V slope except in the area of Valve House 8.

At the north end of the Cell 7 to 8 transition there is some erosion starting near the toe of the slope. The amount of erosion is minimal considering the time the area has been exposed without vegetative growth. This has also been observed in the past in other cells at a similar

stage of the construction. Regardless, this area will need to be repaired. Similar repairs were required on the east side of the Cell 7/8 transition. These repairs are successful and the area is holding well as seen during this inspection.

December Recommendation

No action is required for the observed jog. The grading is per the design drawings and associated Design Change Notices (DCNs). Corresponding calculations indicate that the OSDF is stable and meets the requirements set forth in the Design Criteria Package (DCP).

The erosion noticed at the beginning of the transition on the west side of the OSDF will need to be repaired as spring begins. The goal through the winter should be to minimize further erosion by maintaining good contact of the Coir matting and the topsoil. This can be accomplished by installing additional staples to the Coir matting that is currently in-place. This will help to prevent further erosion of this area until warmer weather arrives and the grass is able to germinate. As the weather breaks after this winter season, the erosion control matting should be removed, the eroded areas should be filled with topsoil, reseeded, and Coir erosion control matting applied and stapled. Performing these operations in the spring will allow the seeds to germinate and vegetation to become established.

March – April Observations

The area of erosion noted in the December OSDF inspection has been repaired, reseeded, and the coir erosion control matting was replaced. The seed mix placed in this area has begun to germinate. Identical work was performed along the transition on the eastern slope which currently has a good stand of grass and does not show any indications of an erosion issue.

RECOMMENDATIONS

Proceed with current repairs of erosion rills – they are effective. Continue to monitor vegetative growth on Cell 8. Geosyntec and Stoller personnel should inspect the vegetative growth on Cell 8 sometime in May 2007, depending on the spring weather (temperature) conditions.

* * * * *

Johnny Reising

From: Jd.Chiou@fluor.com
Sent: Thursday, July 12, 2007 7:41 PM
To: Johnny Reising
Cc: Con_Murphy@rl.gov; Jane Powell
Subject: Re: OSDF Cell 8 Cap

Johnny,

During the June 29 site visit with OEPA and EPA, we all had a close-up look at the OSDF Cell 8 Cap. The cap looked reasonably good. In my opinion it actually looked much better than some of the earlier caps at the same stage following completion of construction. The waving condition was barely noticeable now. John Homer and his team really did a good job maintaining the cap including re-seeding in the mid-slope section, patching of some small erosion, and providing irrigation during the dry weather to keep the grass growing. No ponding condition on the slope or any significant wash out of fine at the toe was observed. The silt fence was properly installed and maintained. In addition to the south slope of the Cell 8 Cap, Jim Fleck and I also took Tom Ontko to look at the western transition zone between the Cell 7 and Cell 8 caps.

I explained the designed functions of the vegetative layer and the subsurface drainage layer of a cap in the filed and in the conference room consistent with my June 15 email (see attached). I also pointed out what was the most serious failure mode that could result in unacceptable ponding conditions all the way down the drainage layer of a cap.

Before the field visit on June 29, Tom O. had an impression that the "tire ruds" on Cell 8 were narrow, localized, deep, and run straight down the slope instead of the 2'-3' wide minor 45 degree waves uniformly across the entire south slope. Understandably he had major concerns based on the "tire ruds" impression. But after seeing the actual conditions of the cap closely and hearing my explanations of the engineering design concepts. He agreed that this is not something that requires a rework or to worry too much about. Everyone else who attended the field visit and subsequent meeting seemed to reach the same conclusion at the end of the day.

In summary the OSDF Cell 8 Cap is functioning as designed. As long as John keeps up the good works as specified in the LM/ICP, Cell 8 will have a long and healthy life like the other 7 caps of the OSDF. Per your request, this email documents the conclusive outcome from the June 29 meeting regarding the Cell 8 Cap issue. Please let me know if you need additional write up on this. Thanks.

J.D.

Jd Chiou
06/15/2007 10:46 AM

To Johnny.Reising@gjo.doe.gov
cc Jane.Powell@lm.doe.gov, Con_Murphy@rl.gov
Subject OSDF Cell 8 Cap

Johnny,

Per your request, following is my "engineering" thought on the waving condition on the Cell 8 Cap:

The OSDF Cap design and performance requirements call for both protection of the top soil layer from erosion and efficient drainage capacity of rain water. The protection against erosion relies on installation of the erosion mat with temporary grass initially and eventually is achieved by a healthy native vegetation cover in the long run. The efficient drainage capacity of the cap

is provided mainly by evaportranspiration (ET) of the healthy vegetative cover and the subsurface drainage system that includes the bio-intrusion barrier layer and the drainage layer over the GML/GCL layer. Surface run-off is NOT to be the main drainage mechanism in a stable cap system in order to minimize erosion of the surface layer. The ideal/designed condition is for the excess rain water to infiltrate through the upper soil layers of the cap into the subsurface rock layers and drain out at the toe of the cap where additional riprap layer is placed to maintain a long term subsurface drainage function and capacity.

The waving condition on the Cell 8 cap surface creates a longer travel distance, lesser slope, and therefore slower storm water run-off velocity. Based on the 45 degree angle of the waves, the run-off travel distance is 40% longer along the slope and the run-off velocity is about 15% slower. Although not intentionally created, this waving condition does reduce the potential of surface erosion and top soil loss by reducing run-off velocity. As a result, it also allows more infiltration of the rain water through the upper soil layers into the subsurface drainage layers in the cap as intended in the design requirements.

Ponding of rain water on the side slope of the Cell 8 Cap due to the waving condition is not considered likely because the side slope is still very steep (~8.4:1) and the subsurface drainage capacity is much higher than the original design because of the added thickness (about double at the toe) of the bio-intrusion barrier layer and the steeper (5.3:1) drainage layer. No ponding condition on the Cell 8 Cap side slope has been observed to date after the wet fall and winter weather.

In our original design consideration, ponding water on a cap could be caused by very localized uneven subsidence of multiple layers of the cap system and a blocked or depressed drainage layer. The observed surface waving condition on the Cell 8 Cap is not among the unacceptable failure modes of the cap.

Please let me know if you have any questions. Thanks.

J.D.

The information transmitted is intended only for the person
or entity to which it is addressed and may contain
proprietary, business-confidential and/or privileged material.
If you are not the intended recipient of this message you are
hereby notified that any use, review, retransmission, dissemination,
distribution, reproduction or any action taken in reliance upon
this message is prohibited. If you received this in error, please
contact the sender and delete the material from any computer.

Any views expressed in this message are those of the individual
sender and may not necessarily reflect the views of the company.