Buttress Design Presentation
Elizabeth Mine TAG Meeting Minutes
March 4, 2004
10:00 to 2:45

Attendees: Ed Hathaway – EPA Project Manager
Wing Chau – EPA On-Scene Coordinator
Scott Acone – USACE Project Manager
John Schmeltzer – VT DEC Project Manager
Cindy Cook – EMCAG Facilitator
Mike Holmquest – Facilitator (intern working with Cindy)
Anne Clift – TAG Geotechnical Engineer
Dick McGaw – TAG Geotechnical Engineer
Lori Barg – TAG Hydrologist
Christopher Hatton – URS Geotechnical Engineer/Lead Designer
Jason Clere – URS Project Manager
Marcel Guay – URS Project Director

The meeting began with a review of the PowerPoint presentation that presented the basis for buttress design followed by a review of the draft design package (which was included in the meeting handout). Group discussion highlights included the following:

Recent Site Work

USACE has improved the inlet channel and regraded around the inlet to facilitate flow into the new inlet (now a stainless steel trash rack). The 0.25-inch (.02 feet) thick steel plate on the new inlet structure results in an invert elevation (the elevation at which water enters the inlet) of 1052.99'. The design called for an invert of 1053.0; so, the structure meets design requirements. The requirement of pre-installation survey was again discussed. The design was based on a surveyed average pond elevation of 1054.0. The invert is set one foot below the pond elevation at 1053.0. Therefore, the average pond elevation should be lowered by one foot with the diversion in place.

Decant Tower 2 was plugged with concrete in February 2004.

For a majority of the past construction season, a USACE representative (Scott, a project engineer, or a construction representative) and an EPA On-Scene Coordinator (OSC) were onsite. During diversion construction, Scott talked to workers at the site several times daily to coordinate activities and remain abreast of activity. During buttress construction, EPA and USACE will have an active site presence. Any questions or concerns should be directed to Ed Hathaway or the EPA OSC, Wing Chau.

Buttress Design

The buttress will extend onto part of western slope of TP-1. This western portion of the buttress is primarily to allow the buttress to tie into high ground. The current cutback of 30 feet is generally consistent with the initial design, but a 6:1 slope chamfer at the crest may slightly exceed the 30-foot cutback.

Removal of tailing at the base of TP-1 will be limited to the area within the buttress disturbance area, because EPA's budget limits work to that necessary to stabilize the tailing dam.

Except for a temporary dewatering drain at the toe of the starter dam (which may be removed, or may remain in place), the intent is that the buttress components will be permanent (incorporated into the final closure of TP1).

Review of construction area versus where trees are located indicates that vegetation clearing will be relatively minor. Contractor will also minimize vegetation clearing since they will have to revegetate all disturbed areas after construction.

Conceptual sequence of work:
1. Mobilize
2. Install erosion control measures
3. Construct sedimentation basin
4. Develop borrow source
5. Consolidate soil staging areas
6. Regrade and re-vegetate upper slope cutback of TP1
7. Install temporary dewatering at starter dam
8. Initiate buttress construction, starting at the bottom and work upwards
9. Establish grass on buttress

<u>Borrow Material and Topsoil</u>
Eight test pits logs (previously requested by the TAG) are included with the meeting handout document.

Borrow source area to be cleared is approximately 8 acres. Because negotiations with the landowners for borrow source are ongoing, EPA can't discuss more detail regarding the location and development of the borrow area at this time.

Approximately 30,000 cubic yards of tailing from the top of TP-1 will be cut back. The current cutback for upper slope regrade is 30 feet, generally consistent with initial design, but a 6:1 slope chamfer at the top edge may push the regrading slightly beyond the original 30 foot cutback estimate.

TAG consultants suggested considering using excavated tailing from the top of TP-1 as part of buttress fill, to reduce the amount of borrow needed for the buttress construction. While the design team appreciates the concept, it has a number of concerns with using tailings for buttress construction:

- The tailings have a large proportion of fines (50-70%), making them very difficult to work with due to moisture sensitivity.

- The buttress contains a number of components (sand filter layer, fill and topsoil); adding an additional material complicates construction sequencing and increases construction costs.
- Use of tailing might create acid mine-affected infiltration that creates precipitation within the toe drain pipes, requiring more maintenance.
- Because of the high fines-content of the tailing and the resulting reduced permeability that fines create when compacted, the use of tailing might create areas of perched water where seepage could result in grass kill, thereby increasing maintenance.

By placing compacted fill on top in most permeable area of TP-1, it will help reduce infiltration.

TAG consultants suggested reopening a stump dump on or near TP-1. The site is privately owned; the property owner would need to go through the formal solid waste and other applicable permitting processes. The TAG consultants indicated that they may approach the landowner about opening a stump dump.

Truck estimates presented in the fall are still consistent with current design. Material quantities have been upgraded, but have not changed substantially.

Sedimentation Basin

The sedimentation basin associated with buttress construction will be approximately one acre in size, 3 acre-feet in volume. EPA will consider enlarging the basin and/or incorporating design features to increase residence time in the basin. Other options (e.g., multiple smaller basins extending downslope) are too expensive.

A TAG advisor suggested the use of active treatment in the sedimentation basin. The project team has not included active water treatment because there isn't enough money in the budget for it.

The NTCRA design may include a collection and treatment system, but the sedimentation basin is only designed to meet erosion and sedimentation control issues associated with buttress construction. Final sedimentation basin design and erosion control measures will be developed in consultation with VT ANR. EPA will keep the TAG informed on development of its sedimentation approach.

Coordination of Emergency Construction with NTCRA Construction

A TAG advisor asked that to the extent feasible, the tailing stabilization work be designed in coordination with the NTCRA work. The EPA team responded that it would very much like to do so, but this is very difficult, because the project team does not have the funding to develop the NTCRA design. (For example: the kind of cover system to be used on TP-1 is an open question. It is difficult to regrade TP-1 to accommodate final closure configuration when no one knows yet what the final configuration of TP-1 will be.)

Construction Safety Issues

EPA requested that TAG advisors coordinate with EPA to schedule site visits during construction. EPA will organized several site visits for EMCAG and community members over the course of the construction season, and can organize additional site visits for TAG advisors, if desired. *No one should go on site without first obtaining landowner permission and clearance from EPA.*

This season's construction activities will be more intensive and safety concerns are heightened. As a result, the site will be posted and unauthorized trespassers will be escorted off site. Safety on the construction is paramount to all parties involved in this project.

Follow-up Items

- Scott to check for pictures of existing stone check dams. (He checked and found that he doesn't have any photos of the check dams. The stone check dams are made of 1 ½" stone about 2 feet high, spaced at about 75 feet apart. A photo of the diversion channel just prior to placement of check dams is attached to the email accompanying this document).
- TAG request that a change to notes on C-010 be made to more clearly describe how smoothing of rills/drainage way is dealt with.
- EPA will check with Dave Hyman to see if there are any new methods to incorporate a capillary break into the regraded cover soil layer.
- TAG consultants requested that:
  - the design team consider locating borrow area on east side of TP-1. It is planned to be on the east site, however, it cannot cost-effectively be turned into the diversion channel,
  - design incorporate the use of new roads to create diversions (already being done),
  - design minimize volume for new buttress materials (quantities optimized during design to be the minimum possible), and
  - the area adjacent to spillway needs to be managed/watched to minimize spring melt erosion.
- USACE to evaluate separation of acid mine drainage and clean water discharge on west side of TP-1 as part of any haul road improvements.

Next Steps

- EPA requested that TAG provide comments next week for consideration prior to finalizing design.

- Final design will be completed by end of March. Draft work plans will be developed in mid April. EPA will meet w/ TAG advisors and organize a site tour on the day of the next EMCAG meeting, which is currently scheduled for April 28 (the meeting may be changed, as a member of the design team has a conflict on 4/28). At the next EMCAG meeting, EPA will present further information about the buttress design and construction sequencing.

- USACE will meet with VT DEC to review erosion control requirements.

- URS will evaluate if there is the risk of an adverse impact to the West Branch as a result of planned construction activities (i.e., tailing regrading). Based on preliminary analyses by the USGS for the horizontal drains (no longer being installed), it appears that there is sufficient buffering capacity in the West Branch to minimize the chance of a construction-related acute effect. At a minimum, all construction activities will incorporate best management practices (minimize areas of exposed, unoxidized tailing, cover exposed areas is a timely manner, route stormwater away from work areas, etc.) to minimize the risk of an adverse impact. If this evaluation shows high potential for acid shock, EPA will consider different treatment options (e.g., surfactants, lime addition, etc.), as well as possible construction sequencing and the use of tarps to minimize the amount of oxidized tailing that is exposed at any given time.