5 Objectives and Criteria

The primary objective of the removal and restoration efforts will be to restore the site so that there are no permanent losses to waters of the United States (Order, §VII, 12 (c)). It is the objective of the work described in this document to assemble the necessary data and critically evaluate the most appropriate way of implementing the removal, restoration, and mitigation activity.

5.1 Assessment Criteria

In order to achieve these objectives, consistent assessment criteria need to be developed to establish the baseline conditions and determine the appropriate degree of removal/restoration. In general, assessment criteria have been broken into three general criteria:

- Habitat-The stream segments and adjacent impacted riparian areas will be restored to levels which provide a habitat value present prior to the spill;
- Hydraulics/Hydrology – Channel hydraulics and hydrology should be restored in a manner to support the restored habitat, minimize future erosion of surfaces where vegetation has been removed, and restore pre-release flood protection conditions; and
- Slurry – Slurry stabilization within stream segments needs to be addressed in a manner that supports the restored habitat and minimizes the potential for further resuspension that may result in continual or additional impacts to biological components and habitat structure

To apply the above criteria, it is imperative to establish baseline conditions. The baseline condition will be established using a variety of techniques. These may include a review of and statistical reduction of existing data, an assessment of reference reaches, and Interviews with those knowledgeable of the stream segment.

Baseline, existing, and post-removal habitat will be compared using a variety of assessment methodologies such as USF&WS's Habitat Evaluation Procedures or EPA's Rapid Bioassessment Protocol, Habitat Assessment Criteria. The selection of a methodology will be based on its ability to discern incremental physical and biological changes over time. Once selected, the methodology will be consistently applied throughout the segment. In addition these methodologies may be augmented with risk-based numeric removal goals for turbidity and/or TSS to help quantify stream segment conditions.

Baseline, existing, and post-removal hydraulics and hydrology will be compared by examining physical alterations of the channel. Appropriate stream restoration activities will be evaluated.

Baseline, existing and post-removal slurry conditions will be compared by examining slurry depth and consistency. Suspended slurry will be compared using numeric turbidity or TSS values. Here the applicable standards and criteria or risk-based values will also be considered.

The impacted areas include a variety of stream and river types and adjacent areas. As such, it is envisioned that a variety of assessment criteria applicable to particular areas will be developed. It is likely these areas will be further broken down for application of criteria based on stream and adjacent land use parameters.

5.1.1 Coldwater Fork and Upper Wolf Creek

These areas include those where removal has already been completed as prescribed by the SACS Team. To date, the methodology used in determining the appropriate level of slurry removal relied primarily on visual inspection by the SACS Team and considered a number of factors, including the extent of impact, accessibility, and land use. Work completed to date is described in Section 4.1. Remaining work in these areas will include stabilization of banks where vegetation was removed as a result of removal operations and replanting of vegetation. The draft Streambank/Floodplain Restoration Plan (SRP) that has been submitted (February 27, 2001) and is currently under review is outlined in Section 7 of this Work Plan. It is assumed that successful implementation of the restoration plan under the direction of the SACS Team will meet the three general criteria above and therefore result in attaining the restoration and mitigation objectives for these segments.

As part of removal activities completed on Coldwater Fork, a gabion weir structure (Cain Weir) was constructed to facilitate slurry containment and removal. Criteria for removal of the structure will be based on recommendations by the SACS Team as determined appropriate by the EPA OSR.

5.1.2 Lower Wolf Creek

Removal activities are currently underway in areas along Lower Wolf Creek. In Lower Wolf Creek the slurry was predominantly deposited within the streambank and on small discontinuous floodplains adjacent to the stream. Additionally, there is limited vehicular access to this segment due to a lack of access roads, the presence of numerous gas and water lines, multiple residential property owners, and deep incision of the stream. Therefore, slurry removal is predominantly being conducted using equipment located instream to wash the banks with stream water, together with light scraping of the banks. This work is being conducted using assessment methodologies previously established by the SACS Team, as directed by the UC. It is assumed that these areas will also be restored under the direction of the SACS Team, in a manner consistent with techniques used in Upper Wolf Creek, thus achieving restoration and mitigation objectives for this segment.

As part of the removal activities conducted on Wolf Creek, three weir structures (Weir Nos. 1.2, and 3) were constructed on Lower Wolf Creek to facilitate slurry containment and removal. Criteria for removal of the remaining weir structures will be based on recommendations by the SACS Team as determined by the EPA OSR.

5.1.3 Rockcastle Creek

Due to the rapid response, installation of the rock-filter berms, gabion weir structures, straw-bale filters, and turbidity curtains on Coldwater Fork were successful in minimizing impacts to Rockcastle Creek. However, during precipitation events, overflow of the weir structures occurred, and it is believed that a minimal amount of slurry may have reached Rockcastle Creek. An assessment of Rockcastle Creek will be performed to evaluate impacts with respect to habitat, hydraulics/hydrology, and slurry influence. The need to take further action on Rockcastle Creek will be based on a comparison of existing conditions to known or predicted baseline conditions, and the potential for these actions to cause further impact. Baseline conditions will be established through a review of existing data and assessment of reference reaches. The benefits of taking removal action in Rockcastle Creek will be weighed against the damage that will be caused by taking the action (removal of vegetation, destruction of habitat, etc).

5.1.4 Tug Fork River

It is recognized that undefined quantities of slurry were discharged to Tug Fork as a result of the release. However, it is anticipated that significant quantities of slurry have already been removed from the Tug Fork by natural processes resulting from ensuing precipitation events.

Potential slurry impacts to Tug Fork are limited to the main channel. In addition, it is believed that any slurry remaining in Tug Fork is undergoing a process of natural stabilization involving washing away of fine-grained material leaving an upper layer of material relatively more resistant to resuspension.

An assessment will be completed on Tug Fork based on the three-general criteria: habitat, hydraulics/hydrology, and slurry influence. Baseline conditions for Tug Fork will be established through a review of existing data and an evaluation of reference reaches. The benefits of taking action to remove slurry in Tug Fork River will be weighed against the damage that will be caused by taking the action (resuspension, down stream impacts, destruction of habitat, etc.).

5.1.5 Big Sandy River

Slurry that had passed though the Tug Fork may have settled in the Big Sandy River. It should be noted that the Big Sandy River has historically received high sediment loads both naturally and from historic coal mining, dredging, and logging operations. Commercial dredging for coarse sand and coal particles is performed in the river and has been for many years. During dredging, coarse particles are recovered and fines are returned to the stream with the water. As such, the release may not have significantly altered the pre-existing habitat. Impacts to the Big Sandy River, if present, would be limited to the main channel.

An assessment will be completed of Big Sandy River based on the three general criteria: habitat, hydraulics/hydrology, and slurry influence. Baseline conditions for the Big Sandy will be established through a review of existing data, an evaluation of reference reaches and interviews with those familiar with the river. The benefits of taking action to remove slurry in the Big Sandy River will be weighed against the damage that will be caused by taking the action (resuspension, downstream impacts, destruction of habitat, etc.).

5.2 Risk-based Objectives

To help quantify conditions under which a habitat may be established and/or restored, criteria will be established, based on an ecological risk assessment as outlined in Section 6.5.

Development of these criteria will consider potential effects on sensitive habitats that support benthic macroinvertebrates and sensitive fish species (i.e., riffle areas). Criteria may consider reduction/modification of benthic populations or sensitive taxa, exhaustion of effects-based suspended solids concentrations, or fish community health indices (i.e., index of biotic integrity). The variability of each stream segment's capacity or ability to support the various biotic communities (benthics or fish) will be determined prior to establishing criteria for that segment or reach.

5.3 Data Quality Objectives

As part of the development of the Sampling Plan referenced in Section 6.2, data quality objectives will be established to ensure the quality of sample collection, maintenance of chain-of-custody, and consistent implementation of laboratory analysis procedures (Order, §VII, 15), as outlined in the Order.