Sandia Canyon SAP Outline

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1.0 Problem Definition

1.1 Questions to be Answered

1) Do elevated concentrations of PCBs or other chemical stressors pose an unacceptable risk to ecological receptors?
   Inputs to resolve this question include:
   - ecological risk assessment endpoints
   - ecological risk measurement endpoints
   - quantification of exposure
   - quantification of effects given exposure

2) What is the inventory of stored PCBs or other chemical stressors in wetland sediments?
   Inputs to resolve this questions include:
   - geomorphic mapping of floodplain and channel deposits
   - chemical concentration data in sediments
   - sediment properties: organic carbon content and grain size

3) What contamination, if any, is entering or leaving the wetland?
   - surface water samples: filtered and unfiltered
   - sediment sample data
   - data from source PRSs

Side Issue:
What mitigation or remediation strategies are needed to address PCB or other chemical stressor impact at the wetland? (Is the 1 ppm cleanup value for water courses from EPA Region 6 an appropriate threshold?)

1.2 Purpose

The Sandia Canyon investigation is prompted by the remedial action taken at PRS 3-056(c). This remedial action was taken to address historical releases of PCBs. During this remediation, the extent of contamination increased over the original estimates, and lead to further assessment of the human health and ecological risk associated with various residual levels of PCBs. Ecological risk was identified as a driver for this site, and the wetlands in Sandia Canyon was the key location to assess potential impacts of residual contamination. Preliminary sampling of the wetland and surface water leading to the wetland indicated detectable quantities of PCBs in wetland sediments as well as the sediments transported in surface water. These data suggested that other PCB sources may be contributing to the PCB inventory in the Sandia Canyon wetland. Thus, a assessment of the wetland as a potential decision unit was appropriate.

1.3 Site Description

site map of Sandia Canyon
- wetland
- known PCB sources
- other sampled PRSs
- unsampled PRSs

historical aerial photos
- show dates that wetland has been present
- help to locate pockets of sediment accumulation

1.4 Existing Data

- 4 sediment samples
- 4 surface water samples - filtered and residual sediment
- 4 additional surface water samples collected during base flow conditions
- ESH outfall sampling
- Biota sampling
  - Saul Cross - aquatic invertebrates
  - Ford-Schmidt - dragonflies
  - Kathy Bennett - small mammals
- possible source data 3-056(c), including in the TA-3,59,60,61 RFI Report
- ESH surface water monitoring for 3-056(c) slope stabilization project
  data collection will start soon

1.5 Regulatory Context

- RCRA
- TSCA
  - PCB spill policy 761.120,125
  - EPA Region 6 policy
- WQCC surface water standards for wildlife (PCBs 0.008 ug/l or 1 ug/l MDL)
- Army Corps of Engineers -- affects excavation of wetlands
- No net loss of wetlands - CWA?
- No degradation of wetlands - CWA?

2.0 SAP Design

2.1 Overview

Basis for SAP will be a geomorphic understanding of the wetlands
- identify areas of historic sediment accumulation
  - floodplain sediments
  - channel sediments
- preliminary geomorphic mapping

based on aerial photos and canyon walkover

Geomorphology will be used to efficiently sample biological exposure areas
- identify receptors
  - shrews, birds for measurement endpoints
  - raptors as assessment endpoints
- locate potential home ranges

Media sampling
- sediments RA OR ACTION LEVEL
- surface water

Biological sampling
- animal collection
- biomarkers

2.2 Design Assumptions

geomorphology
- likely sediment packages to sample
- organic carbon
- sediment grain size

biological receptors/endpoints
- assessment species
  - predaceous birds
- measurement species
  - insectivorous birds
  - small mammals
  - aquatic insects
- parameters to measure
  - reproductive success
  - biomarkers
  - body burdens
  - aquatic insect diversity/abundance

PCBs are primary contaminant
- primary PCB sources include 3-056(c) and power plant spills
- mercury detected above background at some PRSs
- PAHs detected at several PRSs

2.3 Data Uses

quantify inventory

✓ evaluate potential for transport under current conditions
- develop prey species concentrations that would yield and a significant
- effect in predaceous birds

evaluate ecological risk
pathway to assessment endpoint exist?
quantify uptake through food chain to assessment endpoint
determine probability of adverse effects given uptake

2.4 Data Quality Requirements

provide data to Canyons team for modeling remainder of Sandia Canyon
quantify inventory to +/-50% with 95% confidence
provide baseline ecorisk for evaluating potential remedial actions