

Lake Powell Pipeline

Draft Aquatic Resources Work Plan

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Section 1 Introduction

The purpose of this work plan is to define the procedures and methodologies for analyzing potential impacts on Aquatic resources for the Lake Powell Pipeline (LPP). The work plan is prepared to meet requirements for preparation of an Aquatic Resources Technical Report (TR). This work plan presents preliminary issues and concerns, defines the impact area and significance criteria, describes the analysis methodology, summarizes data available and needed, references the outline for the Aquatic Resources TR, and identifies dependency items and relationships to other resources.

Section 2 Issues

Aquatic-related issues and concerns identified during the formal scoping process will be addressed in the analysis for the LPP alternatives. Related questions raised during the informal scoping process have been consolidated into the following issues.

- What impacts would occur on fish and other aquatic species from construction and operation of the LPP?
- What long- and short-term impacts would occur on aquatic habitat from construction and operation of the LPP?

Additional issues that arise during the formal scoping process, or during the preparation of the analysis, will be added and addressed.

Section 3 Impact Topics

The following aquatic resources impact topics have been identified.

- Aquatic fish populations
- Non-fish species aquatic population
- Aquatic habitat (wet)
- Aquatic habitat (riparian)

Section 4

Impact Area and Significance Criteria

4.1 Impact Area

The impact area would include the following:

- Paria River in the area where the pipeline will cross the live stream
- Kanab Creek pipeline crossing
- The Virgin River where the Cedar Valley Pipeline System would cross the live stream
- Other fluvial and seasonal streams that would be crossed by the pipe
- Sand Hollow Reservoir and Quail Creek Reservoirs will receive water from the Lake Powell Pipeline. The impact on the aquatic resource resulting from this transfer will need to be identified. Biota transfer of non-endemic organisms and the resultant modification of water quality on the aquatic habitat of the reservoir will require investigation.
- The Lake Powell intake and intake pipeline construction and operation will result in some short-term changes and have a potential for long-term impacts on the character and habitat of Lake Powell
- Other impacts related to water transfer and groundwater impacts that may impact aquatic species or habitat

4.2 Significance Criteria for Each Impact Topic

As there are no specific regulatory guidelines for supporting aquatic species populations or aquatic habitat loss or impacts, the significance criteria are based on past experience with similar projects and best professional judgment. Sports fishing and T&E species (species of special concern) can have specific regulation governing the taking or loss of some species.

The following criteria will be used initially to determine significant impacts on aquatic species and the various aquatic habitats:

- Activities that could have a measurable effect or disturbing influences on any species of special concern in the project impact area will need to be carefully monitored. These potential species have been identified to date as:
 - Desert Spring Snail
 - Woundfin Minnow
 - Virgin River Chub
 - Razorback Sucker
 - Flannel Mouth Sucker
 - Bluehead Sucker
 - Speckled Dace

Other species of concern may be identified as studies progress. While it is not expected that significant effects will result to any of these species as a result of LPP the potential impacts need to be considered and mitigated as necessary.

- Sport fishing species that could be impacted need to have a monitoring plan developed and implemented. The State Division of Wildlife Resources would be the primary agency involved in this effort since it will involve a long time period. The loss or improvement of sport fish recreation is a significance criterion.
- Biota transfer of native and invasive species will require monitoring and periodic assessment. While the project is only one avenue for biota transfer because of the volume of water involved, it becomes the primary concern. While it may not be possible to manage this potential to any practical extend the ability to monitor the problem is a critical factor.
- Any project activity that reduces or limits the quality of the aquatic resource or habitat either through disturbance or reduction will need to be considered a significance criterion to be monitored and mitigated. Improvements resulting to aquatic environments such as the use of pressurized water for the Hurricane irrigation system resulting in enhanced flow management in the Virgin River must be determined.
- Project activities that could restrict or prevent the natural movement, migration or use of critical fish habitat will need to be considered.

Section 5 Methodology

The following subsections describe the methodology that will be used to address issues and concerns and to define existing aquatic species distributions and habitat use and analyze impacts.

5.1 Introduction and Overall Approach

Aquatic resource impacts will be analyzed by estimating the impact on critical species developed by the fisheries biologist, estimating the area of critical riparian or wet habitat disturbed by construction and operation of the LPP alternatives, estimating the impact of project construction and operation on existing aquatic populations and by estimating direct mortality and significant impact to fish and other aquatic species of concern from construction and operation of LPP alternatives and indirect morality from habitat loss and changes in human population and activity.

5.1.1 Definition of Baseline Conditions

Aquatic resources baseline conditions will be defined the existing fish and other critical aquatic species and populations and habitat conditions in the immediate impact area and surrounding area. Species and habitats will be described using existing data and information, and quantitative field surveys within the impact area are not anticipated.

5.1.2 Analysis of Alternatives

Fish and other critical aquatic species will be mapped for occurrence and distribution using a geographic information system (GIS). Fish species will be identified by concern (sport, endemic, etc.) and available information will be used to identify distribution, population density and areas of specific impact.

Disturbances created by pipeline crossing of streams and channels will be identified in detail and the surrounding areas of direct and indirect potential impact mapped to determine if any critical species may be effected.

All available local and state records, creel census, UDWR information and academic research papers will be collected, catalogued and used to analyze the aquatic resource within the areas of impact.

Of particular interest will be the issue of invasive species, both quagga mussels, mudsnails and other species that have been found in the southwest Colorado River drainage. The distribution of these species will be defined in order to assess how the LPP could impact or be impacted by these organisms.

The alternatives for the LPP project will be evaluated with regard to significance criteria discussed to define measurable potential impacts and determine the need for mitigation.

5.1.3 Analysis of Cumulative Impacts

The aquatic resources cumulative impacts analysis will address the combined impacts of the alternatives and any past or future proposed or planned actions that have or are likely to affect the aquatic species and resources in the impact areas. The inter-related projects and project elements will be identified for analysis cumulative impacts.

Section 6 Data Needs and Analysis

6.1 Data Needs

The following data are needed to perform the analysis.

- Identification of open water, stream and riparian habitat available within the impact area.
- Information on fish and aquatic species distributions, life history (spawning areas and migration patterns, seasonal habitat use, etc.) and responses to project-related activities (turbidity, increased human presence, etc.).
- Areas of important habitat and/or the distribution of aquatic species within the impact area need careful delineation.
- Sport fish information for the lake, reservoirs and streams that support a game fish population.
- Information on biological carrying capacity of each of the significant water features in the project area.

- Analysis of the impacts of construction of the various stream crossing options on water quality and habitat conditions along the pipeline route.
- Information on the characteristics of Lake Powell in the area of the proposed intake and initial pump station will be used to assess potential impacts of construction and operation.

6.2 Data Available and Adequacy

6.2.1 Available Data

The following data sources have been identified to date.

- Navajo generating Station Environmental Assessment
- Paria River Management Plan
- Arizona Rivers, Streams and Wetland Study (also a FERC 10(a)(2)(A) Comprehensive Plan)
- Unique Wildlife Ecosystems of Arizona, USFWS, 1978 (also a FERC 10(a)(2)(A) Comprehensive Plan)
- Arizona Strip EIS
- GSENM Management Plan
- Escalante Management Framework Plan
- Kanab Resource Management Plan
- Colorado River Management Plan
- Biological Opinion for the Colorado River Management Plan
- Biological Opinion on the Operation of Glen Canyon Dam
- Biological Opinion for the Arizona Strip Resource Management Plan
- Virgin River Resource Management and Recovery Program
- Virgin River Management Plan
- Virgin River Watershed Management Plan
- Virgin Spinedace Conservation Agreement and Strategy
- Virgin River Fishes Recovery Plan
- Colorado River Ecology and Dam Management Proceedings 1990, Santa Fe, New Mexico
- New Zealand Mudsail Second Annual Conference 2002, Montana State University
- Glen Canyon Dam Proposed Temperature Control Device Environmental Assessment 2004, U.S. Bureau of Reclamation
- Water Delivery Financing Task Force Report Financing the Lake Powell Pipeline and Bear River project 2004, State of Utah
- River Resource management in the Grand Canyon 1996
- Kanab Field Office Resource Management Plan
- Kanab Field Office Areas of Critical Environmental Concern Draft Report
- Grand Staircase-Escalante National Monument EIS

6.2.2 Level of Analysis With Available Data

The current available data are expected to be sufficient to analyze preliminary proposed alternatives to estimate general levels of impact on aquatic species and habitat for comparison of alternatives.

6.3 Additional Data Needs

6.3.1 Primary

The following primary data needs have been identified.

- Field review by aquatic biologist to evaluate pipeline alignment and stream crossings, reservoirs and the Lake Powell intake structure.
- Discussion with local state fishery experts regarding Lake Powell Pipeline intake structure and screen and the species that need to be protected.
- Development of a strategy with State of Utah Division of Wildlife staff on the biota transfer and evasive species introduction concerns. This may require establishment of a sampling/monitoring program.
- Any specific sampling and data collection identified during the evaluation and the primary data collection tasks.

6.3.2 Secondary

No secondary data needs have been identified.

6.3.3 Level of Analysis with Additional Data

The additional data will be sufficient to perform detailed analysis of impacts on aquatic species and habitat for alternatives carried forward after fatal flaw engineering analysis.

Section 7 Procedures for Development of Mitigation

The analysis of impacts on aquatic resources will be based on standard operating procedures and measures to avoid or reduce impacts that have been used in similar water intakes, pipeline and power generation and transmission projects. The significance criteria for aquatic resources will then be applied to determine if any impact would require modification of the project or mitigation. Mitigation measures would then be developed to offset significant impacts. The mitigation measures will be based on applicable state and Federal statutes and regulations, past experience and best professional judgment to either satisfy a legal requirement or to satisfy the public interest. In some cases significant impacts may not be able to be mitigated. All reasonably foreseeable mitigation options will be evaluated by the Federal Energy Regulatory Commission, Bureau of Land Management, and other responsible federal agencies and factored into the respective decision documents.

Section 8

Technical Report

A technical report will be necessary to document in detail baseline conditions of and potential impacts on fish and aquatic resources. The technical report will follow the resource technical report outline common to all resource work plans (see Resource Technical Report Outline).

Section 9

Dependency Items From Other Resources

The following items are required from other MWH Team resource specialists:

- **Water Quality Resources:** Information on the water quality impacts of transferring Lake Powell water to Sand Hollow Reservoir and other receiving waters.
- **Hydrology and Water Quality:** Information regarding how the flow and quality of the Virgin River will be affected by eliminating the Hurricane irrigation withdrawals from the river.
- **Construction Related:** Information regarding the open cutting or boring for pipeline crossing of existing water bodies.
- **Construction and Operation Related:** Information discussing the Lake Powell intake for the LLP.
- **Wetland Resources:** Location, type and area of wetlands impacted by project construction or operation.