

Lake Powell Pipeline

Draft Paleontological Resource Work Plan

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Section 1

Introduction

The purpose of this work plan is to define the procedures for analyzing impacts on paleontological resources for the Lake Powell Pipeline (LPP). Paleontological resources are the fossilized remains of animals (vertebrates and invertebrates) and plants or traces or evidence of animals. The analysis is in compliance with the following federal legislation: Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 432, 433) and the National Environmental Policy Act of 1969 (NEPA)(P.L. 91-190; 83 Stat. 852; 42 U.S.C. 4321-4327). Applicable Utah State legislation consists of the Antiquities Protection Act of 1993 (U.C.A. Sec. 9-8-101-806). Applicable Arizona State legislation consists of A.R.S. § 15-1631 and 41-841. ET SEQ, The Arizona Antiquities Act.

This work plan presents the issues and concerns, defines the impact area and significance criteria, describes the analysis methodology, reviews existing data and identifies data needs, references an outline for the paleontological resources Technical Report, and identifies dependency items and relationships to other resources.

Section 2

Issues

Paleontological Resources-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 issue(s).

- What impacts would occur on paleontological localities?
- What impacts would occur on vertebrate and other fossils?
- What impacts would occur on paleontologically sensitive formations?

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 paleontological resource impact topics include the following:

- Paleontological localities
- Paleontologically sensitive formations

Section 4

Impact Area and Significance Criteria

4.1 Impact Area

The impact area would include the following:

- Any area directly affected by project feature construction or operations
- Any stream or river and associated corridor that would be subject to water deliveries or alterations in flow

4.2 Significance Criteria for Each Impact Topic

Impacts on paleontological resources will be considered significantly adverse if project implementation results in adverse effects on Condition 1 or 2 paleontologically sensitive geological formations or in adverse effects on Class 1, 2, or 3 paleontologically sensitive fossil localities. The rationale for these significance criteria is discussed below.

Paleontological research will be guided, in part, by a geologic formation classification system and a sensitivity classification of fossil localities, both suggested by the Bureau of Land Management (BLM) and modified from the Committee on Guidelines for Paleontological Collecting (Committee) (1987). The classification system for defining the paleontological sensitivity of geological formations consist of the following from the BLM:

Condition 1. Formations known to contain fossils of significant scientific interest, or where significant fossils (especially vertebrates) are likely to be discovered with detailed field work.

Condition 2. Formations where fossils are present, but by their nature are not anticipated to be of high scientific value.

Condition 3. Formations containing few fossils or those found are of little scientific value.

The classification system for defining the paleontological sensitivity of fossil localities consist of the following from Committee (1987:174):

Class 1. Critical - reference locality for holotype or critical paleontological material, or any type section of geological strata needed for future study. All vertebrate fossil sites fall within this category.

Class 2. Significant - any locality that produces rare, well-preserved, or critical fossils usable for taxonomic, evolutionary, stratigraphic, paleoenvironmental, or paleoecological studies.

Class 3. Important - any locality that produces common, abundant fossils useful for stratigraphic or population variability studies.

Class 4. Insignificant - any locality with poorly preserved, common, or stratigraphically unimportant fossil material.

Class 5. Unimportant - any locality intensively surveyed and determined to be of minimal scientific interest.

Ultimately, the significance of paleontological localities and fossil finds will be determined by the lead federal agency in consultation with the federal land owning agency (if applicable), the Utah State Paleontologist (USP) and the Director of the Arizona State Museum. The lead federal agency, in consultation with the federal land owning agency (as applicable), and the USP, determines the

significance of impacts and treatment planning related to these resources. Impacts on paleontological resources are considered significant if either of the following were to occur:

- Disturbance of paleontological resources, including fossil localities, geologic formations containing fossils or isolated fossil finds that are on file with the USP's Office.
- Alteration of paleontological resources, including fossil localities, geologic formations containing fossils or isolated fossil finds that are on file with the USP's Office.

Section 5 Methodology

The following section describes the methodology that will be used to address issues and concerns related to paleontological resources, to identify paleontological resources within the impact area of influence, and to analyze impacts on the resource.

5.1 Introduction and Overall Approach

The analysis of impacts on paleontological resources will involve identifying geologic formations containing scientifically significant fossils, known fossil localities or isolated fossil finds within the impact area of influence, defining the characteristics of each fossil locality or find that contribute to the significance, and determining the effect of the alternatives and cumulative impacts on each fossiliferous formation, fossil locality or isolated find.

5.1.1 Definition of Baseline Conditions

Paleontological Resources baseline conditions will be defined by determining which geological formations are present and each formation's paleontological sensitivity. Baseline conditions also will be defined by determining what fossil localities are already known in or near the impact areas.

5.1.2 Analysis of Alternatives

Impacts on paleontological resources will be analyzed for each of the alternatives. These impacts will be measured by paleontological sensitivity of geologic formations under each alternative and the presence and kind of known fossil localities..

5.1.3. Analysis of Cumulative Impacts

The paleontological 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 paleontological resources in the impact area. The following inter-related projects may be analyzed for cumulative impacts.

- Proposed St. George Airport
- Proposed Southern Corridor Highway, St. George to Hurricane Highway

Section 6 Data Needs and Analysis

6.1 Data Needed

The data needed to perform the analysis include:

Geologic maps showing the geologic formations, compilation of background research and information known for the LPP impact area in preparation for undertaking fieldwork.

A field survey and recordation of paleontological resources.

6.2 Data Available and Adequacy

The data required to complete the paleontological resources analysis can be acquired from the following identified and existing sources:

Geologic maps are available covering the impact area. Obtain existing information on fossiliferous formations, known localities and previous paleontological resource projects from published sources, files of the BLM field Offices and Grand Staircase-Escalante National Monument, National Park Service, Office of the State Paleontologist at the Utah Geological Survey and Arizona State Museum. Information available at the geology departments at Brigham Young University and the University of Utah also may be consulted.

6.3 Additional Data Needs

6.3.1 Primary

The following data will be required in addition to the data described in Section 6.2:

A field inventory and recordation of paleontological resources within the LPP. At this time, it is not known how many alternatives, or portions of alternatives may have been previously inventoried and whether those inventories are adequate for the purposes of this study. Additionally, it is not known how many fossil localities within the project area have been previously recorded. As such, only general methodological guidance for the field portion of the project is described here.

Formations and deposits of Condition 1 sensitivity will be examined wherever exposures occur within the impact area of influence. Formations and deposits of Condition 2 sensitivity will be examined at known localities and spot surveyed and sampled within the impact area. New localities will be recorded on Paleontological Locality Data Forms.

6.3.2 Secondary

The following data will be required in addition to the data described in Section 6.2: (description of data need from governmental agencies, historical records, or derived from other resource analysis results, etc.)

- Describe additional data needed and how to be acquired.

Section 7

Procedures For Developing Mitigation

The analysis of impacts on paleontological resources will be based on the standard operating procedures and measures to avoid or reduce impacts, both of which will be included in the project description chapter of the Draft (name of document). The significance criteria for paleontological resources will then be applied to determine if any impact would be significant. 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 requirement. 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 paleontological 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 paleontological analysis is dependent on input from the following resources:

Geology: Geologic maps and interpretation of geology as they relate to potential occurrence of paleontological resources

GIS: Geologic and other maps and GIS data pertaining to paleontological resources