APPENDICES

Appendix A Summary Scoping Report

RECLAMATION
Managing Water in the West

SCOPING SUMMARY REPORT

Minidoka Dam Spillway Replacement Project Environmental Impact Statement

Minidoka Project
Burley, ID

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Snake River Area Office

August, 2009

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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SCOPING SUMMARY REPORT

MINIDOKA DAM SPILLWAY REPLACEMENT

The Proposed Project

The Bureau of Reclamation is preparing an environmental impact statement (EIS) for the proposed Minidoka Dam Spillway Replacement project. The purpose of the project is to prevent a structural failure of the Minidoka Dam spillway and associated structures. Alternatives currently being considered are No Action as required under NEPA, total replacement of the spillway and headgate structures, or replacement of just the spillway.

The purpose of this summary report is to provide a summary of the major comments and issues received as part of the scoping process under the National Environmental Policy Act (NEPA).

Background

Minidoka Dam impounds Lake Walcott and is a feature of Reclamation's Minidoka Project. It is located on the main stem Snake River about 18 miles northeast from the city of Burley, ID within the Minidoka Wildlife Refuge. After over 103 years of continued use, the over 2000 feet long concrete spillway at the Minidoka Dam has reached the end of its functional lifespan. The concrete that forms the spillway crest and the piers of the pier-and-stoplog structure shows extensive visible deterioration at numerous locations. In addition, the potential for ice damage to the stoplog piers requires that reservoir water levels be dropped each winter. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen along the spillway. The current conditions of the Minidoka Dam spillway and headgate structures present increasingly difficult reliability and maintenance problems. If structural problems are not corrected there is potential of partial or complete failure of the spillway and headgates. If these failures occur, Reclamation may not be able to meet contractual obligations for water delivery, power generation and Reclamation's commitments to deliver flow augmentation water under the Nez Perce Settlement Agreement and the Endangered Species Act.

A related action currently being studied is a structural raise (to be determined) of Minidoka Dam to accommodate a 5-foot raise in the Reservoir Water Surface (RWS) elevation. The Idaho Water Resource Board (IWRB) is funding a special study that explores the feasibility and costs associated with this action. The purpose of the dam raise is to increase the storage capacity of Lake Walcott by approximately 50,000 acre-feet as one element of efforts to address water supply concerns in the Eastern Snake River Plain Aquifer area. The IWRB anticipates the additional supplies of stored water could be used to help address surface and groundwater demands by implementing improvement measures being considered by the State. If the IWRB decides to pursue this action, a supplemental EIS will be developed to evaluate impacts.

Scoping Process

Scoping is an essential part of public involvement. Public involvement is a process for including interested and affected individuals, organizations, and local, state and federal agencies in the decision making process. Scoping is a term used for the process of seeking comments and public information to identify significant issues related to a proposal.

The scoping process for this project was initiated on November 13, 2008 when a Notice of Intent to prepare an EIS and to conduct public scoping meetings was published in the *Federal Register*. A scoping letter discussing the project and notifying the public of the scoping meetings was sent to a mailing list of 106 individuals, organizations, governmental agencies, and congressional delegates. A similar letter was sent to 28 tribal governments.

Initially, two public scoping meetings were held. The first meeting was held in Idaho Falls, Idaho on December 3, 2008, the second was held in Burley, Idaho on December 4, 2008. Sixteen people in total attended the scoping meetings. At the public meetings, Reclamation presented the proposed alternatives, provided an overview of the NEPA process, and provided opportunities for the public to identify issues and concerns associated with the proposed project. In addition to comments received at the scoping meetings, written comments were accepted through December 19, 2008. At the Shoshone Bannock Tribe's request, a public meeting was held from 6-8 p.m. on the Shoshone-Bannock Reservation on April 7, 2009. One member of the public attended the meeting.

Five letters of comment were received. Comments ranged from brief comments and questions to detailed statements. Each comment relevant to the project has been summarized under an issue category, and is presented in this document. Comments received during the scoping process dealing with issues, concerns, and potential impacts will be considered by Reclamation in the preparation of the Draft EIS. Additional issues will also be considered as they arise.

The comments received will be used to assist in the following:

1. Identifying the significant issues relevant to the proposed action.
2. Identifying those elements of the environment that could be affected by the proposed action.
3. Formulating new or modifying current alternatives for the proposed action.

The Notice of Intent, news release, scoping letter, maps, and meeting handouts are attached to this document.

Summary of Comments and Issues

This section identifies the major comments and issues provided to Reclamation as part of the scoping process.

1. **Elimination of Winter Drawdown**
    - Adverse effects to downstream vegetation and waterfowl.
    - Potential for Eurasian milfoil to invade Lake Walcott at a higher water elevation.

2. **Alternatives**
    - What is the purpose of the spillway?
    - When the new spillway is being built will the silt in front of the old spillway be cleaned out?
    - What is the timeframe for construction?
    - After the replacement goes in, will the old one be removed?
    - Will the water be drawn down?

3. **Economic impact to the Minidoka Irrigation District**

4. **Fish Entrainment in canal diversions, hydroelectric generators, and the spillway**
    - Include an analysis of alternatives to prevent canal entrainment including screening, electrical barriers, strobes, and/or bypass structures.
    - What fish species are in Lake Walcott?

5. **Spillway Fishery below Minidoka Dam**
    - Need to maintain the sport fishery for rainbow trout, smallmouth bass, and other species.
    - Current flows in the spillway represent the minimal discharge needed to sustain basic aquatic life in this area particularly during the summer months.
    - The ability to stabilize flows below the spillway has the potential to increase the productivity of the fishery. Conversely, any loss, modification, or degradation of flows has the potential to affect a locally popular fishery.
    - Include an analysis of alternatives to maintain or improve aquatic resource conditions and the sport fishery.

6. **Wetland Habitat below Minidoka Dam Spillway**
    - Include an analysis of alternatives to maintain, improve, or mitigate impacts to wetland habitats below Minidoka spillway.

7. **Spillway Flows**

- Partial mitigation for the impacts resulting from the replacement of the powerplant requires that Reclamation release certain flows during the irrigation season.
- Include an analysis of alternatives to maintain, improve, or mitigate flows below the Minidoka spillway.

8. Lake Walcott Water Levels

- Annual winter drawdown of the reservoir negatively affects a number of aquatic species including trout and smallmouth bass.
- Benefits to fish resources as a result of water level stabilization, with options for periodic drawdown to manage wetland/aquatic vegetation, should be included in the analysis.

9. Endangered Species Act

- Yellow-billed cuckoo (candidate species)
- Desert valvata (endangered species)
- What Threatened and Endangered species are in the reservoir or below it?
- Are there land locked Sturgeon?

10. Species of Greatest Conservation Need

- One invertebrate, one amphibian, variety of birds.

11. Previous mitigation commitments

- Need to ensure that commitments for previous actions at the Minidoka Project have been fulfilled and /or are addressed in the spillway replacement analysis.

12. Water resources impacts

- Water quality degradation.

13. Habitat, Vegetation, and Wildlife

- Habitat for various species may be disturbed during construction.
- Construction activities will disturb vegetation which may spread noxious weeds and exotic (non-indigenous) plants.
- What is the distance between American Falls and the Minidoka spillway? Will the distance and amount of water affect any species along that distance?

14. Wetlands and riparian areas

- Clean Water Act Section 404 permit.

15. Air quality

- Potential impacts from construction activities.

16. Climate change

- Consider how climate change might affect resources as well as how greenhouse gas emissions from the project may affect climate change.

17. Cumulative effects

- Should clearly identify the resources that may be cumulatively impacted, the time over which impacts are going to occur, and the geographic area that will be impacted.

18. Environmental Justice

- Determine if environmental justice populations (minority and low-income) occur within the geographic scope of the project.
- Address the potential for disproportionate adverse impacts to minority and low-income populations, and the approaches used to foster public participation by these populations.

19. Historic and cultural resources

- Discuss potential impacts to historic and cultural resources, and treaty rights (ITA's) and describe coordination with affected tribal governments.
- Do we need to have monitors out during the project construction?
- The area of Lake Walcott was once in the Shoshone-Bannock Treaty, but the treaty was never ratified and they lost them, this area is very important to the Tribes
- There is an incredible amount of looting when water goes down at reservoir. If the water is drawn down need to ensure protection of these sites and the Tribes would like to have a monitor at for the reservoir.

20. Monitoring

- Include implementation and effectiveness monitoring.

22. Miscellaneous

- Need to make sure that equipment is cleaned prior to entering area to ensure there are no epidemics of invasive species like mussels or other aquatic travelers.
- Why are there no screens to prevent sturgeon from going down the canals?
- There are a lot of areas that are not disturbed and every effort should be taken to protect these areas.

23. Outside Scope of Project

- Have we taken into consideration the coal plant that is going to be built near American falls?
- The coal plant could deposit up to 10% of its debris per year, this should be addressed.

- What about the Simplot chemicals, have any tests occurred to test for these polluting the water at Lake Walcott?
- Has the Snake River aquifer been taken into consideration and effects from pollution or reservoir change been incorporated into that?
- Spillway Replacement alternatives are premature since a study of a dam raise is currently underway.
- Increase capacity of site (raise the dam) as part of the spillway project.
- Delay to Spillway Replacement if dam raise is pursued.
- Does sediment deposition affect carrying capacity?

Tribal Government to Federal Government Consultation and Scoping of Issues

A meeting was held April 7th, 2009 with the Shoshone-Bannock Fort Hall Business Council from 11:00 a.m. to12:00 p.m. The meeting was attended by Chairman, Vice Chairman, and four Council members. Reclamation employees included the Assistant Area Manager, Activity Manager and the Native American Affairs Coordinator. Discussion ranged from brief comments and questions to detailed statements. They are summarized within the categories identified above. No written comments were received. In addition, the following comments, although not considered scoping issues, are comments considered as part of the Tribal Government to Federal Government Consultation.

- The council looks for employment opportunities for Tribal members, the economy is even worse on the Reservation, they would like Reclamation to add something to the contract so that any sub-contracting or hiring of employees would have native preference, work with the TERO office to do this.

- Tribes want to be involved from day one, not when the project is near completion.

- When the construction starts will they be able to hire Tribal folks?

Attachments

Notice of Intent

Dated: November 6, 2008.

Randall B. Luthi,

Director, Minerals Management Service.

[FR Doc. E8–26995 Filed 11–12–08; 8:45 am]

BILLING CODE 4310–MR–C

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

Minidoka Dam Spillway Replacement; Minidoka County, ID

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice of intent to prepare an Environmental Impact Statement.

SUMMARY: Pursuant to section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969, as amended, the Bureau of Reclamation (Reclamation) intends to prepare an Environmental Impact Statement (EIS) on the proposed Minidoka Dam Spillway Replacement. Alternatives currently being considered are No Action as required under NEPA, total replacement of the spillway and headgate structures, or replacement of just the spillway.

Reclamation is requesting early public comment and agency input to help identify significant issues or other alternatives to be addressed in the EIS. Information obtained during the scoping period will help in developing information to be included in the EIS. A draft EIS is expected to be provided to the public for review by winter, 2009 followed by opportunities to provide written and oral comments. The final EIS is scheduled for completion in winter, 2010. A Record of Decision, describing which alternative is selected for implementation, and the rationale for its selection, would then be issued following a 30-day waiting period.

DATES: Scoping meetings will be held on the following dates and times:

- *Idaho Falls, ID: December 3, 2008:* Open House Meeting 6 pm to 9 pm.
- *Burley, ID: December 4, 2008:* Open House Meeting 6 pm to 9 pm.

Written comments will be accepted through December 19, 2008 for inclusion in the scoping summary document. Please direct requests for sign language interpretation for the hearing impaired or other auxiliary aids, to Ms. Allyn Meuleman by November 24, 2008, at the telephone or fax numbers listed under the **FOR FURTHER INFORMATION** section of this notice.

ADDRESSES: Comments and requests to be added to the mailing list may be submitted to Bureau of Reclamation, Snake River Area Office, Attention: Allyn Meuleman, Activity Manager, 230 Collins Road, Boise, ID 83702–4520. Comments may also be submitted electronically to *minidoka_dam_eis@pn.usbr.gov.*

The scoping meetings will be held at the following locations which are physically accessible to people with disabilities.

- Red Lion Hotel, 475 River Park Way, Idaho Falls, ID 83402
- Burley Best Western Inn, 800 North Overland Avenue, Burley, ID 83318

FOR FURTHER INFORMATION: Contact Allyn Meuleman, (208) 383–2258, fax: (208) 383–2237 for additional information. Information on this project can also be found at: *http://www.usbr.gov/pn/programs/eis/minidokadam/index.html.*

SUPPLEMENTARY INFORMATION: The purpose of the proposed spillway replacement action is to prevent a structural failure of the Minidoka Dam spillway and associated structures.

Minidoka Dam impounds Lake Walcott and is a feature of Reclamation's Minidoka Project. They are located on the main stem Snake River about 18 miles northeast from the city of Burley, ID within the Minidoka Wildlife Refuge. After over 103 years of continued use, the over 2000 feet long concrete spillway at the Minidoka Dam has reached the end of its functional lifespan. The concrete that forms the spillway crest and the piers of the pier-and-stoplog structure shows extensive visible deterioration at numerous locations. In addition, the potential for ice damage to the stoplog piers requires that reservoir water levels be dropped each winter. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen along the spillway. The current conditions of the Minidoka Dam spillway and headgate structures present increasingly difficult reliability and maintenance problems. If structural problems are not corrected there is potential of partial or complete failure of the spillway and headgates. If these failures occur, Reclamation may not be able to meet contractual obligations for water delivery, power generation and Reclamation's commitments to deliver flow augmentation water under the Nez Perce Settlement Agreement and the Endangered Species Act.

A related action which may be considered is a structural raise (to be determined) of Minidoka Dam to accommodate a 5-foot raise in the Reservoir Water Surface (RWS) elevation. The Idaho Water Resource Board (IWRB) is funding a special study that explores the feasibility and costs associated with this action. The purpose of the dam raise is to increase the storage capacity of Lake Walcott by approximately 50,000 acre-feet as one element of efforts to address water supply concerns in the Eastern Snake River Plain Aquifer area. The IWRB anticipates the additional supplies of stored water could be used to help address surface and groundwater demands by implementing improvement measures being considered by the State. If the IWRB decides to pursue this action, a supplemental EIS will be developed to evaluate impacts.

Public Involvement

Reclamation will conduct public scoping meetings to solicit input on the alternatives developed to address replacement of the Minidoka Dam Spillway and associated structures and the impacts associated with those alternatives. Reclamation will summarize comments received during the scoping meetings and written comments received during the scoping period, identified under **DATES**, into a scoping summary document which will be made available to those who have provided comments. It will also be available to others upon request and will be posted on the Web site listed under **FOR FURTHER INFORMATION**.

If you wish to comment, you may provide your comments as indicated under the **ADDRESSES** section. Before including your name, address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment (including your personal identifying information) may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

J. William McDonald,

Regional Director, Pacific Northwest Region.

[FR Doc. E8–26990 Filed 11–12–08; 8:45 am]

BILLING CODE 4310–MN–P

News Releases

News Release RECLAMATION

Managing Water in the West

Pacific Northwest Region
Boise, Idaho

Media Contact: John Redding, 208-378-5012 jredding@pn.usbr.gov Allyn Meuleman, 208-383-2258 ameuleman@pn.usbr.gov

Released On: November 21, 2008

Reclamation Hosts Public Meetings for Minidoka Dam Spillway Replacement EIS

The Bureau of Reclamation will hold two public scoping meetings for the proposed Minidoka Dam Spillway Replacement aimed at preventing possible structural failure of the dam's spillway and associated structures. Minidoka Dam is located on the Snake River about 18 miles northeast of Burley, Idaho.

The scoping meetings will give the public the opportunity to identify issues and concerns associated with the currently proposed alternatives, and to identify other potential alternatives that could be considered in the Environmental Impact Statement (EIS). Alternatives currently being considered are No Action as required under National Environmental Policy Act, total replacement of the spillway and headgate structures, or replacement of just the spillway. Scoping meetings will be held:

December 3, 6:00 - 9:00 p.m., Red Lion Hotel 475 River Park Way, Idaho Falls, ID

December 4, 6:00 - 9:00 p.m., Burley Best Western Inn 800 North Overland Avenue, Burley, ID

In addition to comments received at the scoping meetings, written comments will be accepted through December 19, and may be submitted to Bureau of Reclamation, Snake River Area Office, Attention: Allyn Meuleman, Activity Manager, 230 Collins Road, Boise, ID 83702, or at 208-383-2258. Comments may also be submitted electronically to minidoka_dam_eis@pn.usbr.gov. The meeting facilities are physically accessible to people with disabilities.

Minidoka Dam was constructed in 1906 by Reclamation as part of the Minidoka Project. The dam is operated as one of five storage facilities constructed on the Snake and Henrys Fork rivers. The multi-purpose project provides irrigation, power production, flood control, recreation, and fish and wildlife benefits.

For more information about the project, please go to:
http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

# # #

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at www.usbr.gov.

Relevant Links:

http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

News Release RECLAMATION

Managing Water in the West

Pacific Northwest Region
Boise, Idaho

Media Contact: David Walsh, 208-378-5026 dwalsh@pn.usbr.gov Allyn Meuleman, 208-383-2258 ameuleman@pn.usbr.gov

Released On: April 02, 2009

Reclamation Hosts Public Meeting for Minidoka Dam Spillway Replacement EIS

The Bureau of Reclamation will hold a public scoping meeting for the proposed Minidoka Dam Spillway Replacement project on April 7 in Fort Hall, Idaho. The spillway on the 103 year-old dam has been targeted for replacement and has reached the end of its functional lifespan.

The dam, located on the Snake River about 18 miles northeast of Burley, Idaho, is a major feature of Reclamation's Minidoka Project.

The scoping meeting will be an opportunity for the public to identify issues and concerns associated with the currently proposed alternatives, and to identify other potential alternatives that could be considered in the Environmental Impact Statement (EIS).

Alternatives currently being considered are: No Action as required under National Environmental Policy Act (NEPA), total replacement of the spillway and headgate structures, or replacement of just the spillway.

The April 7 scoping meeting will be held from 6:00 to 8:00 p.m., at the Shoshone-Bannock Tribal Office, Business Council Conference Room, Pima Drive, Fort Hall, Idaho. The meeting facilities are physically accessible to people with disabilities.

In addition to comments received at the scoping meetings, written comments will be accepted through April 30, 2009, and may be submitted to Bureau of Reclamation, Snake River Area Office, Attention: Allyn Meuleman, Activity Manager, 230 Collins Road, Boise ID 83702-4520 or at (208) 383-2258. Comments may also be submitted by email at: minidoka_dam_eis@pn.usbr.gov.

Minidoka Dam was completed in 1906 and is operated as one of six storage facilities on the Snake and Henry's Fork rivers. The multi-purpose project provides irrigation, power production, flood control, recreation, and fish and wildlife benefits.

For more information about the project, please go to: http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

Scoping Letter

RECLAMATION
Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

Minidoka Dam Spillway Replacement EIS

MINIDOKA PROJECT

SCOPING MEETINGS

DECEMBER 2008

Reclamation intends to prepare an Environmental Impact Statement (EIS) on the proposed Minidoka Dam Spillway Replacement. Reclamation is requesting early public comment and agency input to help identify significant issues or other alternatives to be addressed in the EIS. Information obtained during the scoping period (November 12-December 19, 2008) will help in developing information to be included in the EIS. A draft EIS is expected to be provided to the public for review by winter, 2009 followed by opportunities to provide written and oral comments. The final EIS is scheduled for completion in winter, 2010. A Record of Decision, describing which alternative is selected for implementation, and the rationale for its selection, would then be issued following a 30-day waiting period. Additional information about the project is available at Reclamation's website:

http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

PUBLIC SCOPING MEETINGS

Reclamation is hosting two public meetings to obtain your input about the project. During these meetings, the current alternatives being considered will be described and staff will be available to answer questions. You will also be given an opportunity to identify issues and concerns associated with the current alternatives and to identify other potential alternatives.

SCOPING MEETING DETAILS

Wednesday, December 3, 2008	***Thursday, December 4, 2008***
Red Lion Hotel	Burley Best Western Inn
475 River Park Way	800 North Overland Avenue
Idaho Falls, ID	Burley, ID

Both meetings are from 6 – 9 p.m.

The meeting facilities are physically accessible to people with disabilities. If you need other accommodations or auxiliary aids, please contact Allyn Meuleman 208 -383 -2258 before November 24th, 2008.

PURPOSE AND NEED

The purpose of the proposed spillway replacement action is to prevent a structural failure of the Minidoka Dam spillway and associated structures. Minidoka Dam impounds Lake Walcott and is a feature of Reclamation's Minidoka Project. They are located on the main stem Snake River about 18 miles northeast from the city of Burley, Idaho within the Minidoka Wildlife Refuge. After over 103 years of continued use, the over 2,000 feet-long concrete spillway at the Minidoka Dam has reached the end of its functional lifespan. The concrete that forms the spillway crest and the piers and-stoplog structure shows extensive visible deterioration at numerous locations. In addition, the potential for ice damage to the stoplog piers requires that reservoir water levels be dropped each winter. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen along the spillway. The current condition of the Minidoka Dam spillway and headgate structures present increasingly difficult reliability and maintenance problems. If structural problems are not corrected, there is potential of partial or complete failure of the spillway and headgates. If these failures occur, Reclamation may not be able to meet contractual obligations for water delivery, power generation, and commitments to deliver flow augmentation water under the Nez Perce Settlement Agreement and the Endangered Species Act.

PROPOSED ALTERNATIVES

Reclamation is currently investigating the alternatives identified below.

- No Action
- Total replacement of the spillway and headgate structures
- Replacement of just the spillway

YOUR FEEDBACK REQUESTED

We want to hear your thoughts about the issues and concerns associated with the proposed alternatives. Please attend one of the scoping meetings scheduled in December 2008 to provide input. If you cannot attend one of our public scoping meetings, please submit your comments using the enclosed comment form and return it to us by December 19, 2008.

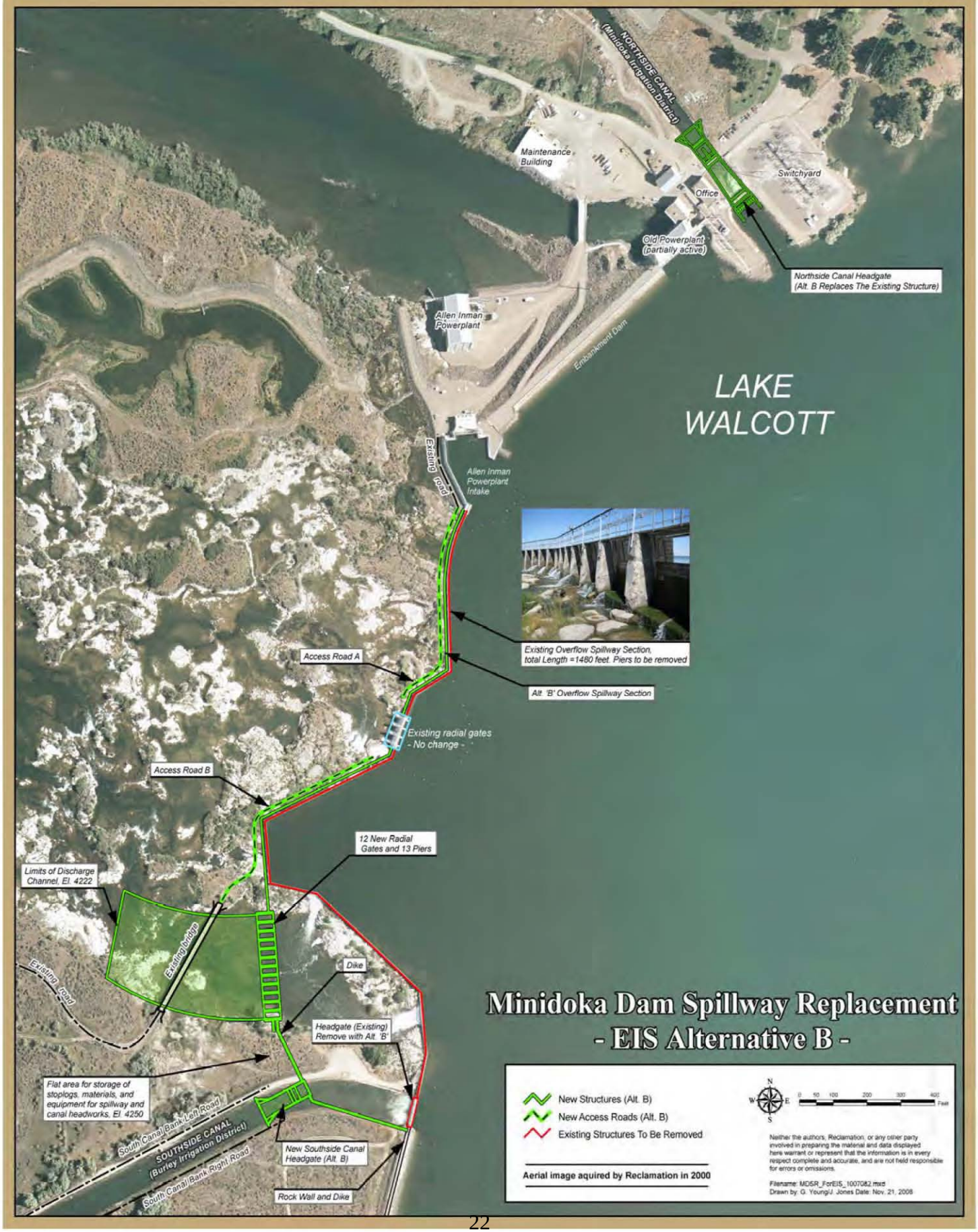
FOR MORE INFORMATION

For more information about the project, please contact:

Allyn Meuleman, Activity Manager
Bureau of Reclamation
230 Collins Road
Boise, Idaho 83712
208-383-2258 (telephone)
208-383-2275 (fax)
minidoka_dam_eis@pn.usbr.gov

Maps

RECLAMATION *Managing Water in the West*


NORTHSIDE CANAL
(Minidoka Irrigation District)
Maintenance Building
Switchyard
Office
Old Powerplant (partially active)
Northside Canal Headgate (Alt. B Replaces The Existing Structure)
Allen Inman Powerplant
Embankment Dam
LAKE WALCOTT
Existing Road
Allen Inman Powerplant Intake
Existing Overflow Spillway Section, total Length =1480 feet. Piers to be removed
Access Road A
Alt. 'B' Overflow Spillway Section
Existing radial gates - No change -
Access Road B
12 New Radial Gates and 13 Piers
Limits of Discharge Channel, El. 4222
Existing Dredge
Existing Road
Dike
Headgate (Existing) Remove with Alt. 'B'
Flat area for storage of stoplogs, materials, and equipment for spillway and canal headworks, El. 4250
South Canal Bank Left Road
SOUTHSIDE CANAL
(Burley Irrigation District)
South Canal Bank Right Road
New Southside Canal Headgate (Alt. B)
Rock Wall and Dike
Minidoka Dam Spillway Replacement
- EIS Alternative B -
New Structures (Alt. B)
New Access Roads (Alt. B)
Existing Structures To Be Removed
Aerial image aquired by Reclamation in 2000
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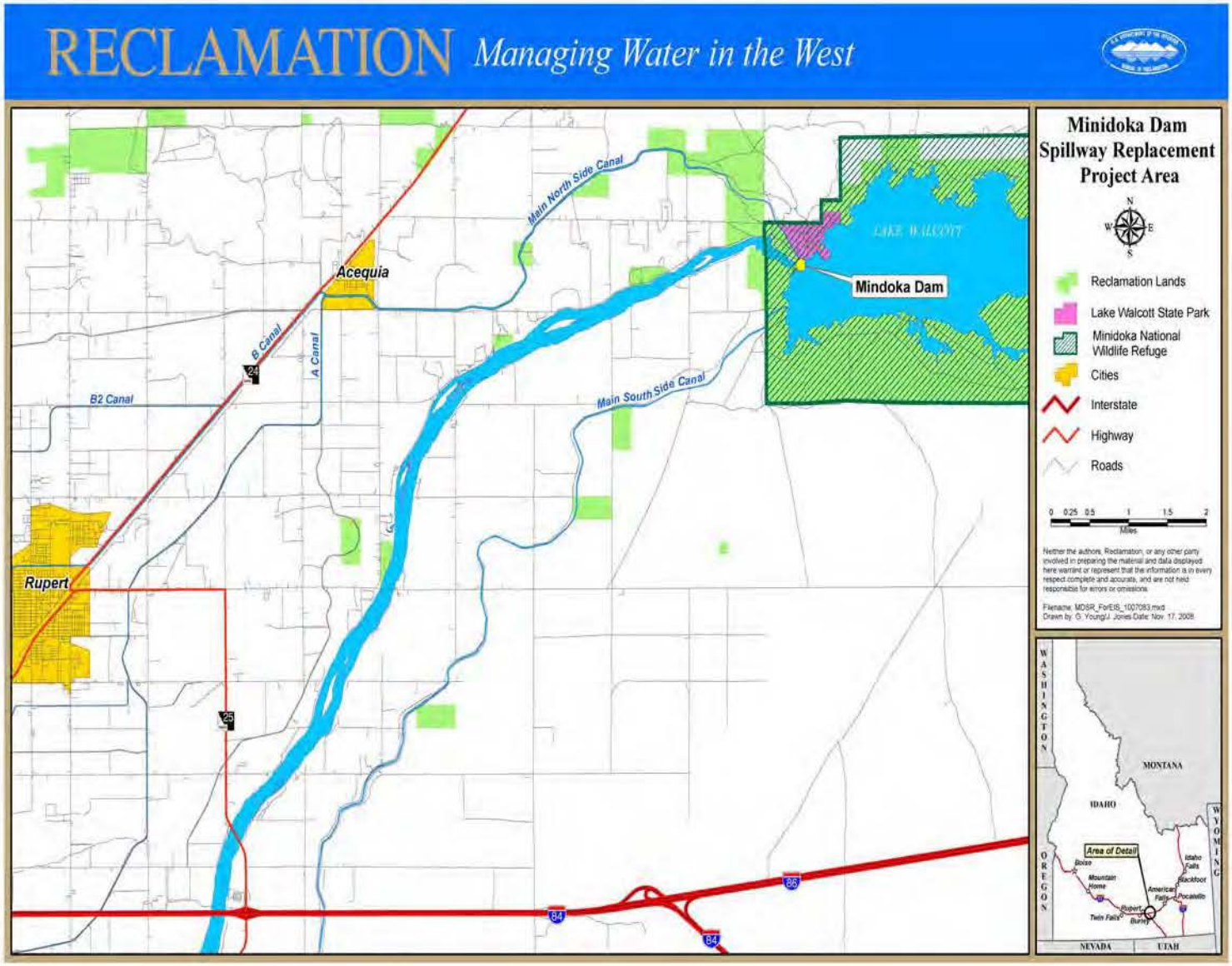
0 50 100 200 300 400 Feet
Neither the authors, Reclamation, or any other party involved in preparing the material and data displayed here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.
Filename: MDSR_ForEIS_1007082.mxd
Drawn by: G. Young/J. Jones Date: Nov. 21, 2008


RECLAMATION Managing Water in the West
Minidoka Dam Spillway Replacement Project Area
Reclamation Lands
Lake Walcott State Park
Minidoka National Wildlife Refuge
Cities
Interstate
Highway
Roads
Miles
Main North Side Canal
Main South Side Canal
Acequia
Rupert
Mindoka Dam
B Canal
A Canal
B2 Canal
24
25
84
86
WASHINGTON
MONTANA
IDAHO
WYOMING
OREGON
NEVADA
UTAH
Area of Detail
Boise
Mountain Home
Twin Falls
Rupert
Burley
American Falls
Pocatello
Idaho Falls
Blackfoot

Meeting Handouts

MINIDOKA DAM SPILLWAY REPLACEMENT

Minidoka Project

ENVIRONMENTAL COMPLIANCE

December 2008

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) was enacted into law on January 1, 1969. It requires Federal agencies to evaluate and consider environmental factors during decision making and to seek input to these evaluations from state and local agencies, Tribal Governments, organizations, and the public. Agencies also must consider and evaluate a range of alternatives that meet the purpose and need of the proposed action.

When a Federal action is determined likely to significantly affect the quality of the human environment, an environmental impact statement (EIS) is prepared. The EIS provides decision-makers with important information on the types of issues and concerns identified by the public, the expected environmental consequences of all alternatives, and potential mitigation measures.

Terms Commonly Associated with an EIS

- **Federal Action –** This is what triggers the requirement for NEPA compliance. It can be an action that the Federal agency will take, or a decision that must be made, that may significantly impact the human environment.

- **Scoping –** The process by which input from the public, agencies, and organizations is sought to help define the alternatives, issues, and impacts that should be addressed in the EIS.

- **Purpose and Need –** The statement of purpose and need identifies the underlying reasons why an action is needed.

- **Proposed Action –** This is the action initially identified to meet the identified purpose and need for action.

- **Alternatives –** These are reasonable actions that meet the identified purpose and need of the proposed action.

- **Federal Preferred Alternative –** This is the alternative that the Federal agency proposes to implement. If one has been identified, it will be described in the Draft EIS. A Preferred Alternative must be identified in the Final EIS.

- **No Action Alternative –** This is considered to be the most likely future without implementation of the proposed action or other alternative.

- **Alternatives Considered but Eliminated From Further Study –** These are other alternatives considered, but not found to be technically feasible or to reasonably meet the purpose and need of the proposed action.

- **Record of Decision –** This document summarizes the alternatives considered in the EIS and identifies the agency's decision along with the basis for that decision.

NEPA as an Umbrella for Other Environmental Laws

Compliance with related environmental laws, rules, regulations, and executive and secretarial orders is integrated into the NEPA process and documented in the EIS. However, these other laws, regulations and Executive and Secretarial Orders have their own specific compliance requirements separate from NEPA. A partial list of other major environmental laws, regulations, and Executive and Secretarial Orders requiring compliance includes:

Endangered Species Act
Fish and Wildlife Coordination Act
National Historic Preservation Act
Clean Water Act
Environmental Justice Executive Order
Sacred Sites Executive Order
Indian Trust Assets Secretarial Order

FOR MORE INFORMATION

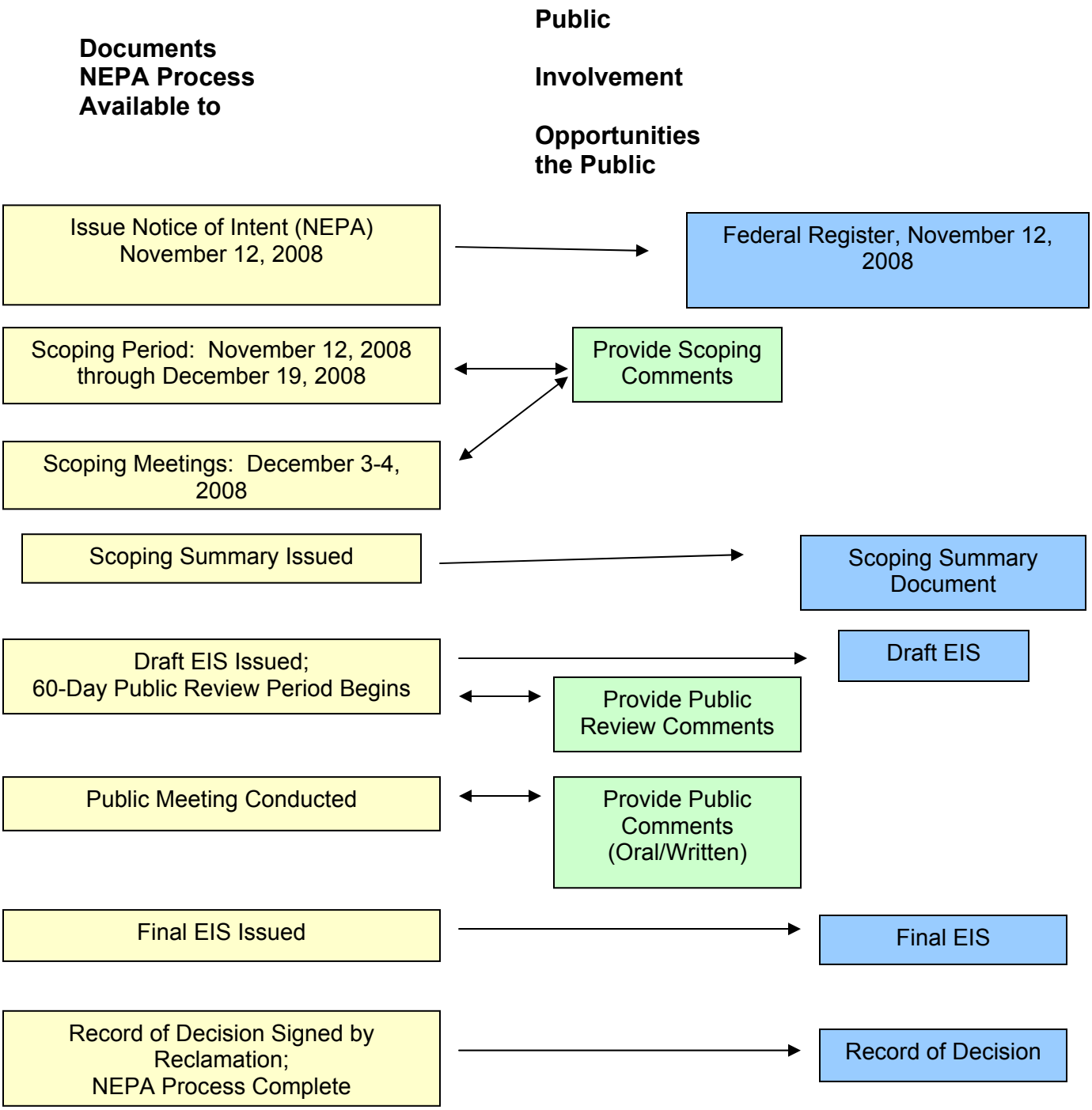
EIS Website:
http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

Activity Manager: Allyn Meuleman
Bureau of Reclamation
230 Collins Road
Boise, Idaho 83702-4520

208-383-2258
208-383-2237 FAX
Minidoka_dam_eis@pn.usbr.gov

MINIDOKA DAM SPILLWAY REPLACEMENT
Minidoka Project

NEPA PROCESS
December 2008



Contact: Allyn Meuleman, Activity Manager, Bureau of Reclamation, 208-383-2258

Minidoka Dam Spillway Replacement
Minidoka Project

Fort Hall, Idaho
April 7, 2008

AGENDA

6:00 p.m. **Doors open**

6:15 p.m. **Welcome**
Chris Ketchum, Assistant Area Manager, Reclamation
Hap Boyer, Natural Resource Manager, Reclamation

PowerPoint Presentation by Reclamation
Allyn Meuleman, Activity Manager, Reclamation

Identification of Issues and Concerns
Take this opportunity to provide written comments about any issues or concerns you have about the impacts associated with the alternatives currently proposed or identify other alternatives that address the project's purpose and need.
Comment categories include:

- ***Historic Properties/Cultural Resources***
- ***Recreation***
- ***Water Resources and Reservoir operations***
- ***Water quality***
- ***Fish and Wildlife***
- ***Threatened and Endangered Species***
- ***Vegetation/Wetlands***
- ***Economics***
- ***Other Issues and Concerns***
- ***Alternatives***

This is also an opportunity to review maps and other information and have one-on-one discussions with technical team members and managers.

Review and Wrap-Up

8:00 p.m. **Adjourn**
If you have additional comments, please turn in your comment form before you leave.

Minidoka Dam Spillway Replacement
Minidoka Project

PUBLIC SCOPING MEETING

Idaho Falls, Idaho
December 3, 2008

AGENDA

6:00 p.m. **Doors open**

6:15 p.m. **Welcome**
Chris Ketchum, Activity Manager, Reclamation

PowerPoint Presentation by Reclamation
Allyn Meuleman, Activity Manager
Lola Abshire, Environmental Specialist
Keith Brooks, Civil Engineer

Identification of Issues and Concerns
Take this opportunity to provide written comments about any issues or concerns you have about the impacts associated with the alternatives currently proposed or identify other alternatives that address the project's purpose and need. Post-its are provided for you to record your comments and then place them on the appropriate comment board.

Comment board categories include:

- ***Historic Properties/Cultural Resources***
- ***Recreation***
- ***Water Resources and Reservoir operations***
- ***Water quality***
- ***Fish and Wildlife***
- ***Threatened and Endangered Species***
- ***Vegetation/Wetlands***
- ***Economics***
- ***Other Issues and Concerns***
- ***Alternatives***

This is also an opportunity to review maps and other information and have one-on-one discussions with technical team members and managers.

Review and Wrap-Up

9:00 p.m. **Adjourn**
If you have additional comments, please turn in your comment form before you leave.

Minidoka Dam Spillway Replacement
Minidoka Project

PUBLIC SCOPING MEETING

Burley, Idaho
December 4, 2008

AGENDA

6:00 p.m. **Doors open**

6:15 p.m. **Welcome**
Chris Ketchum, Assistant Area Manager, Reclamation

PowerPoint Presentation by Reclamation
Allyn Meuleman, Activity Manager
Lola Abshire, Environmental Specialist
Keith Brooks, Civil Engineer

Identification of Issues and Concerns
Take this opportunity to provide written comments about any issues or concerns you have about the impacts associated with the alternatives currently proposed or identify other alternatives that address the project's purpose and need. Post-its are provided for you to record your comments and then place them on the appropriate comment board.

Comment board categories include:

- ***Historic Properties/Cultural Resources***
- ***Recreation***
- ***Water Resources and Reservoir operations***
- ***Water quality***
- ***Fish and Wildlife***
- ***Threatened and Endangered Species***
- ***Vegetation/Wetlands***
- ***Economics***
- ***Other Issues and Concerns***
- ***Alternatives***

This is also an opportunity to review maps and other information and have one-on-one discussions with technical team members and managers.

Review and Wrap-Up

9:00 p.m. **Adjourn**
If you have additional comments, please turn in your comment form before you leave.

COMMENT FORM

Minidoka Dam Spillway Replacement

Name (please print legibly):	
Organization:	
Mailing Address:	
City, State, and Zip Code:	
Telephone (optional):	**E-mail (optional):**

If you received this form in the mail or attended a public scoping meeting you will be placed on our mailing list.

___ I want my name removed from this mailing list.

Please note: Before including your name, address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment (including your personal identifying information) may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

My comments on the Minidoka Dam Spillway Replacement are:

_____

_____

_____

_____

_____

(Use back of sheet or additional sheets as necessary)

Please mail, fax, or email your comments before December 19, 2008, to: Allyn Meuleman, Activity Manager, Bureau of Reclamation, 230 Collins Road, Boise, ID 83702-4520; fax: (208) 383-2237; email: Minidoka_dam_eis@pn.usbr.gov

Comments (continued)

Please mail, fax, or email your comments before December 19, 2008, to: Allyn Meuleman, Activity Manager, Bureau of Reclamation, 230 Collins Road, Boise, ID 83702-4520; fax: (208) 383-2237; email: Minidoka_dam_eis@pn.usbr.gov

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Appendix B Minidoka Final EIS 11x17 Figures

Figure Number	Title
2-1	Minidoka Dam EIS proposed alternatives
2-2	Alternative A – No Action.
2-3	Minidoka Dam spillway replacement recreation and public use areas.
2-4	Alternative B – Spillway and headworks replacement.
2-5	Alternative B excavation areas.
2-6	Minidoka Dam spillway replacement proposed biological flows and wetland mitigation area.
2-7	Alternative B – Minidoka Dam spillway replacement recreation and public use areas.
2-8	Minidoka Dam spillway replacement staging, waste areas, and construction closure points.
2-9	Alternative C – Spillway replacement.
3-2	Changes in spillway area inundation based on a mininum flow of 500 cfs.
3-3	Snail pool and all year release point.
3-4	Winter release flow pattern based on elevations.

Figure 2-1

Minidoka Dam Spillway Replacement
- EIS Alternatives -

EIS Alternatives

- A: No Action (Existing)
- B: Total replacement of the spillway and North Side and South Side headworks.
- C: Replacement of just the spillway.

Aerial image aquired by Reclamation in 2000

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Filename: MDSR_ForEIS_100708.mxd
Drawn by: J. Jones Date: Nov. 9, 2009

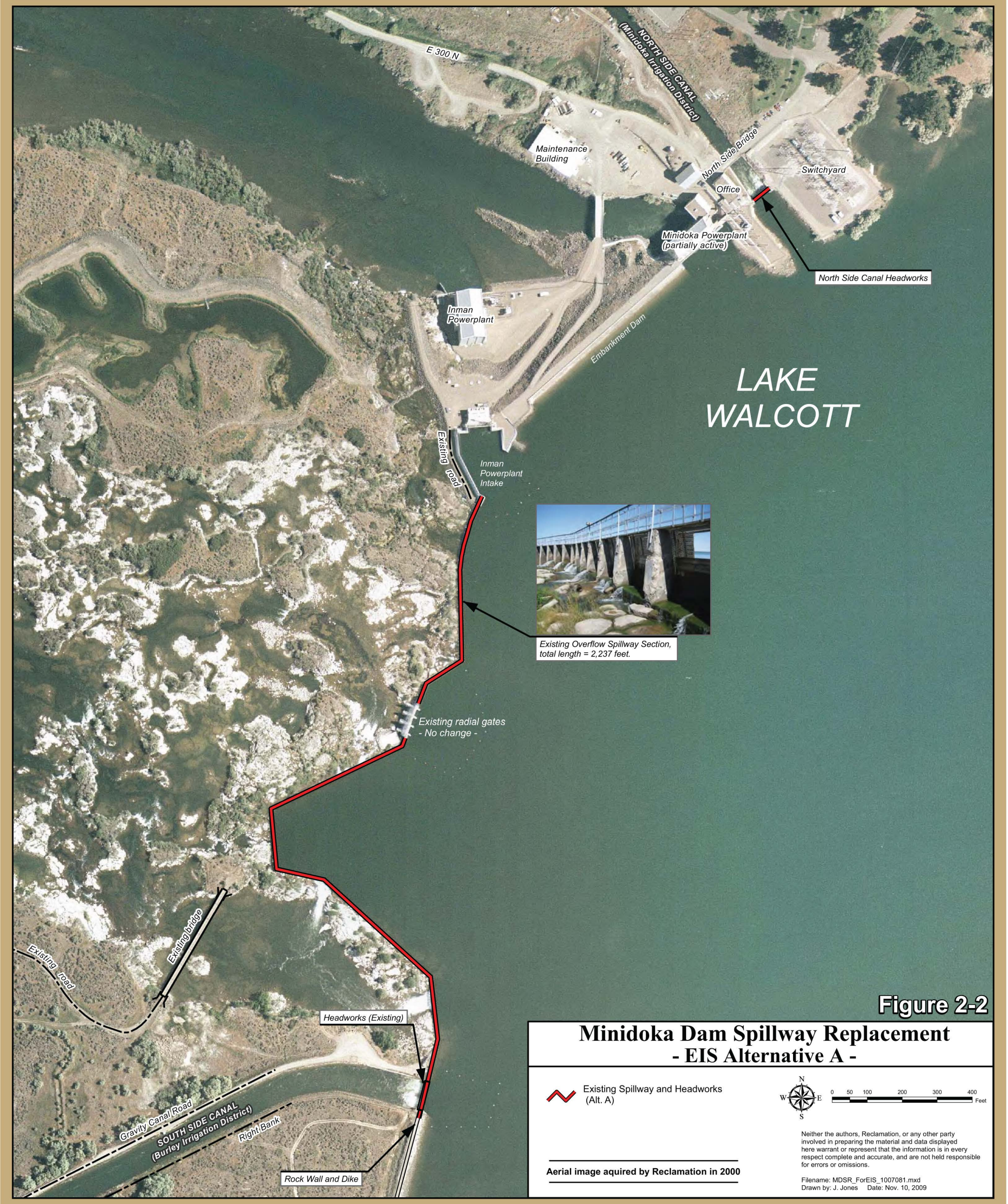
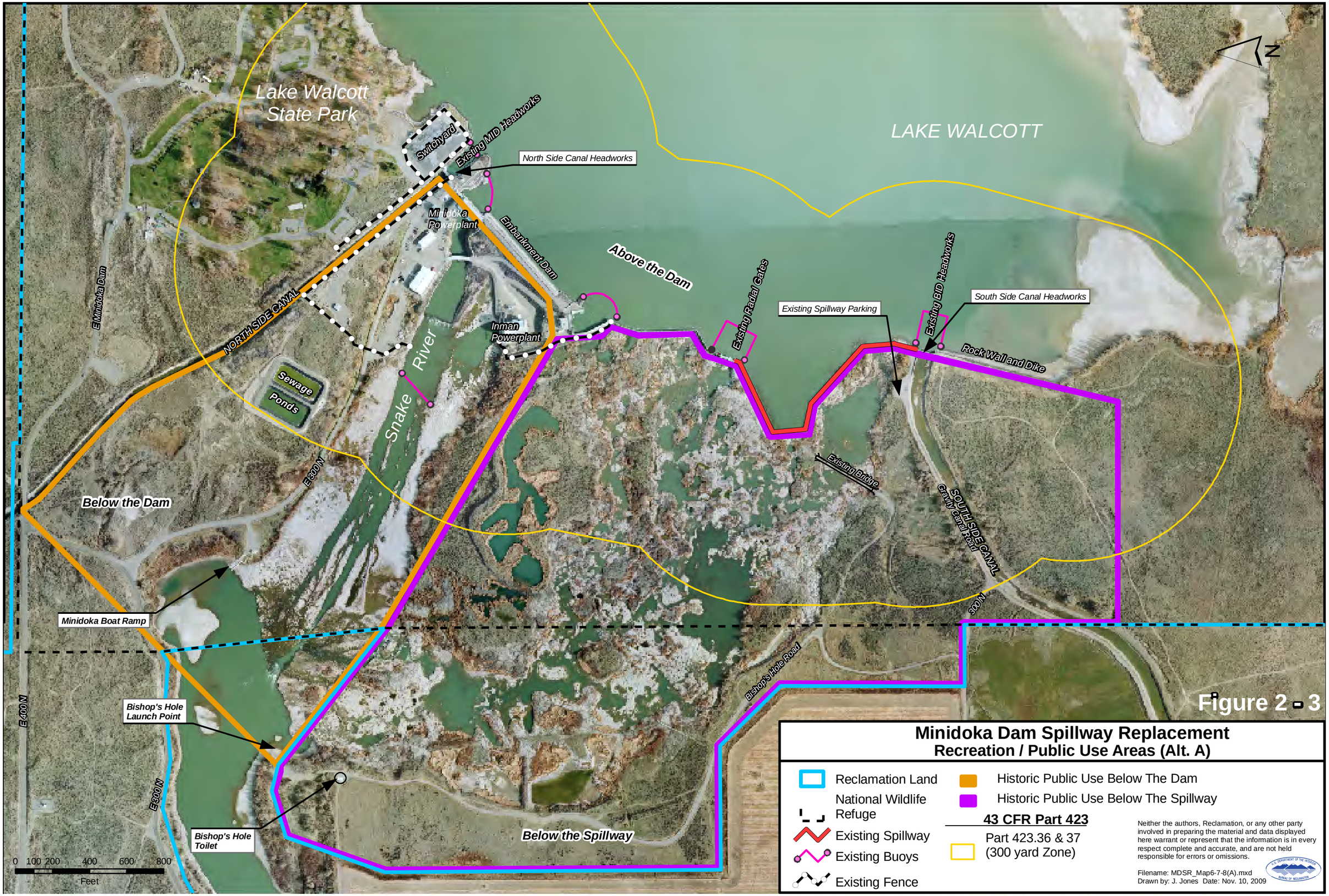


Figure 2-2

Minidoka Dam Spillway Replacement
- EIS Alternative A -


Lake Walcott State Park
LAKE WALCOTT
N
Switchyard
Existing MID Headworks
North Side Canal Headworks
Minidoka Powerplant
Embankment Dam
Above the Dam
Existing Radial Gates
Existing BID Headworks
South Side Canal Headworks
Existing Spillway Parking
Rock Wall and Dike
E Minidoka Dam
NORTH SIDE CANAL
Inman Powerplant
Snake River
Sewage Ponds
E300 N
Existing Bridge
SOUTH SIDE CANAL
Gravity Canal Road
300 N
Below the Dam
Minidoka Boat Ramp
Bishop's Hole Road
E400 N
Bishop's Hole Launch Point
E300 N
Bishop's Hole Toilet
Below the Spillway
0 100 200 400 600 800
Feet
Figure 2 - 3
Minidoka Dam Spillway Replacement
Recreation / Public Use Areas (Alt. A)
Reclamation Land
National Wildlife Refuge
Existing Spillway
Existing Buoys
Existing Fence
Historic Public Use Below The Dam
Historic Public Use Below The Spillway
43 CFR Part 423
Part 423.36 & 37 (300 yard Zone)
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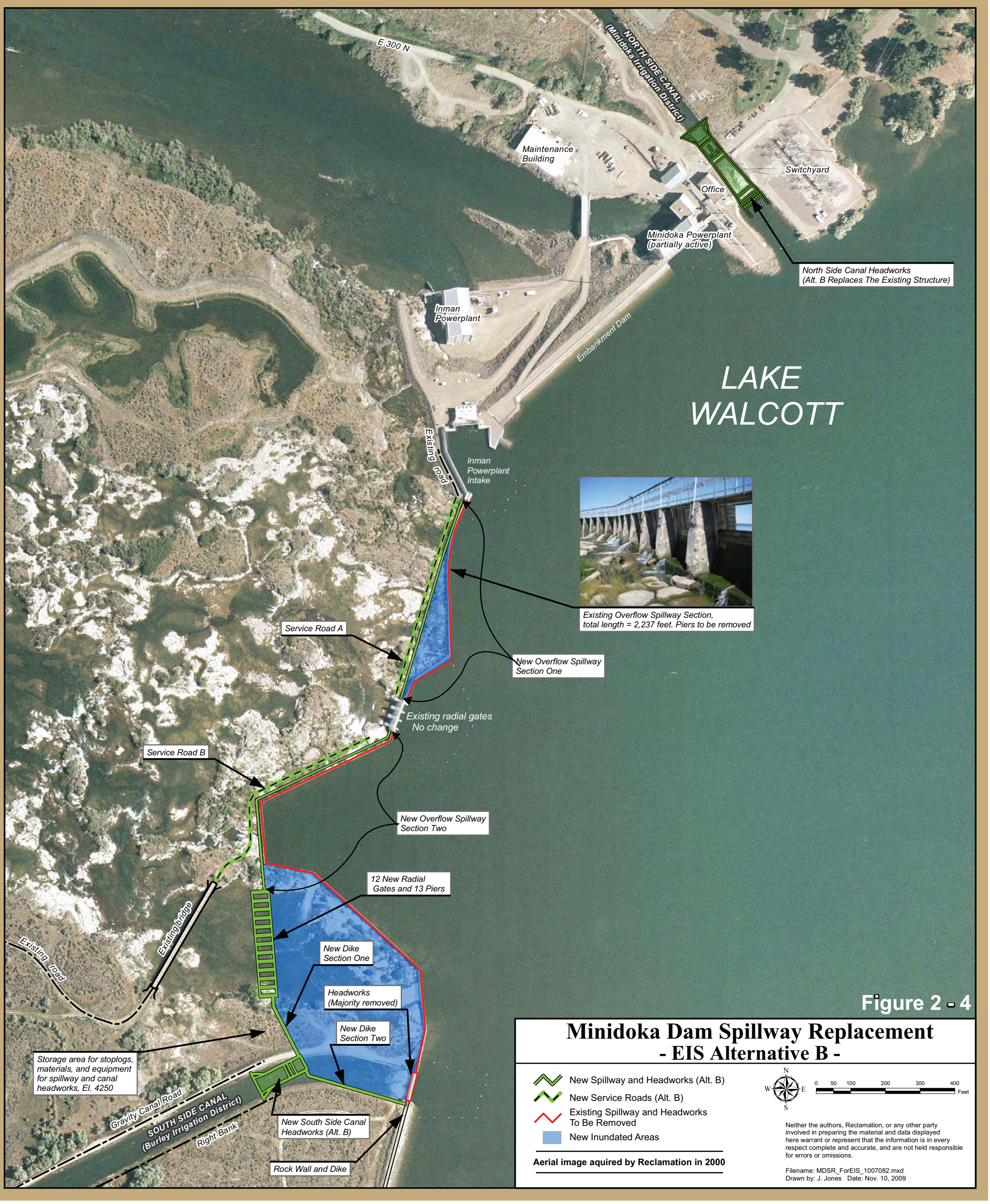
Filename: MDSR_Map6-7-8(A).mxd
Drawn by: J. Jones Date: Nov. 10, 2009

RECLAMATION *Managing Water in the West*



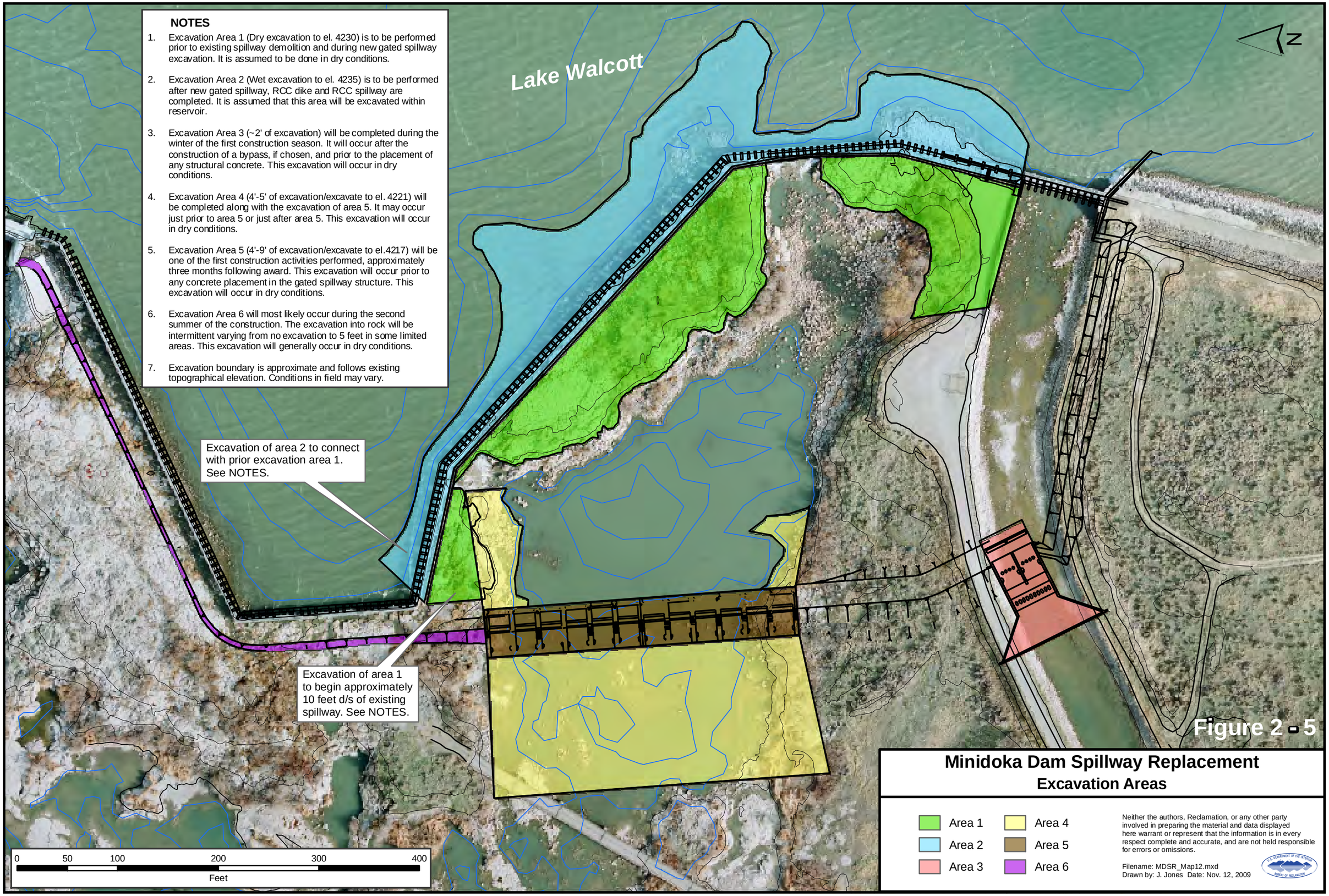

NOTES
1. Excavation Area 1 (Dry excavation to el. 4230) is to be performed prior to existing spillway demolition and during new gated spillway excavation. It is assumed to be done in dry conditions.
2. Excavation Area 2 (Wet excavation to el. 4235) is to be performed after new gated spillway, RCC dike and RCC spillway are completed. It is assumed that this area will be excavated within reservoir.
3. Excavation Area 3 (~2' of excavation) will be completed during the winter of the first construction season. It will occur after the construction of a bypass, if chosen, and prior to the placement of any structural concrete. This excavation will occur in dry conditions.
4. Excavation Area 4 (4'-5' of excavation/excavate to el. 4221) will be completed along with the excavation of area 5. It may occur just prior or just after area 5. This excavation will occur in dry conditions.
5. Excavation Area 5 (4'-9' of excavation/excavate to el.4217) will be one of the first construction activities performed, approximately three months following award. This excavation will occur prior to any concrete placement in the gated spillway structure. This excavation will occur in dry conditions.
6. Excavation Area 6 will most likely occur during the second summer of the construction. The excavation into rock will be intermittent varying from no excavation to 5 feet in some limited areas. This excavation will generally occur in dry conditions.
7. Excavation boundary is approximate and follows existing topographical elevation. Conditions in field may vary.
Lake Walcott
N
Excavation of area 2 to connect with prior excavation area 1. See NOTES.
Excavation of area 1 to begin approximately 10 feet d/s of existing spillway. See NOTES.
0 50 100 200 300 400
Feet
Minidoka Dam Spillway Replacement
Excavation Areas
Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Neither the authors, Reclamation, or any other party involved in preparing the material and data displayed here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.
Filename: MDSR_Map12.mxd
Drawn by: J. Jones Date: Nov. 12, 2009

Figure 2 - 5

LAKE WALCOTT
Lake Walcott State Park
Switchyard
Existing MID Headworks
North Side Canal Headworks (Replaces The Existing Structure)
NORTH SIDE CANAL
Minidoka Powerplant
Embankment Dam
Inman Powerplant
Snake River
E Minidoka Dam
Sewage Ponds
E 300 N
Existing Radial Gates (No Change)
New South Side Canal Headworks
New Radial Gates
Existing BID Headworks
Rock Wall and Dike
South Side Canal Headworks (Majority Removed)
SOUTH SIDE CANAL
Gravity Canal Road
Bishop's Hole Road
(IS) Water released during Irrigation Season
(NIS) Water released during Non Irrigation Season.
1 50 cfs (IS) and 0 cfs (NIS)
2 300 cfs (IS) and 0 cfs (NIS)
3 50 cfs (IS) and 100 cfs minus seepage (NIS)
Releases through point 3 will be added to any natural seepage to result in 100 cfs minimum flow all year.
Example: If seepage is 20 cfs then 80 cfs will be released.
4 When necessary to satisfy minimum flow requirements, additional releases will be made through the powerhouses. Minimum flows, comprised of both powerhouse and spillway flows, will be 525 cfs during dry water type years and 600 cfs for average and high water type years. (Measurements are taken at USGS gauge located at Howells Ferry)
N
0 100 200 400 600 800
Feet
Minidoka Dam Spillway Replacement
Proposed Biological Flows & Wetland Mitigation Area
New Spillway and Headworks
Existing Spillway
National Wildlife Refuge
Reclamation Land
Winter Release Flows
Water Release Gate
Area to be planted with Native Plants
Wetland Mitigation Area
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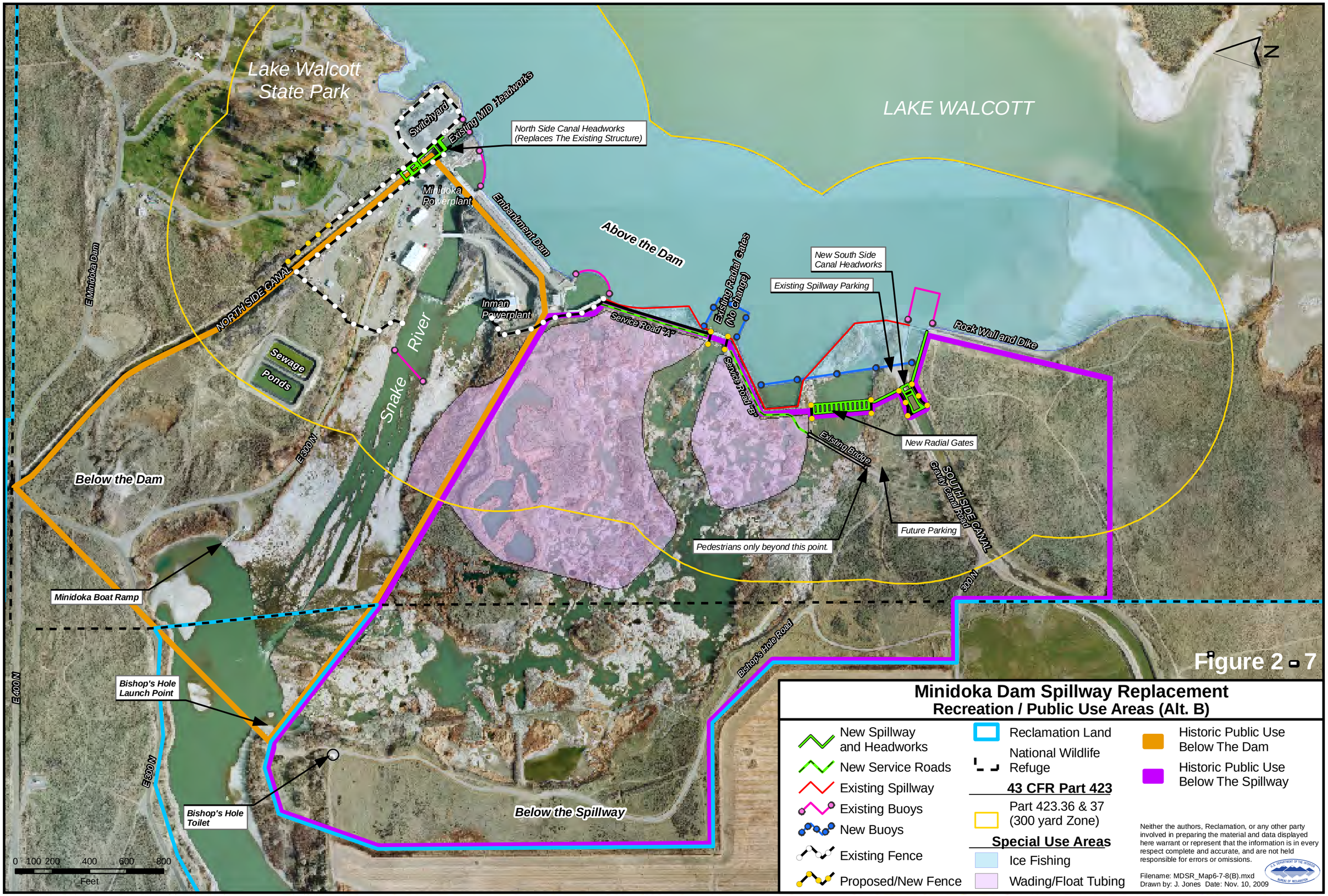
Filename: MDSR_Map5.mxd
Drawn by: J. Jones Date: July 16, 2010

Figure 2 - 6


Lake Walcott State Park
LAKE WALCOTT
N
Switchyard
Existing MID Headworks
North Side Canal Headworks (Replaces The Existing Structure)
Minidoka Powerplant
Embankment Dam
Above the Dam
Existing Radial Gates (No Change)
New South Side Canal Headworks
Existing Spillway Parking
Rock Wall and Dike
Service Road "A"
Service Road "B"
Inman Powerplant
NORTH SIDE CANAL
E Minidoka Dam
Sewage Ponds
Snake River
E 300 N
Existing Bridge
New Radial Gates
SOUTH SIDE CANAL
Gravity Canal Road
Future Parking
Pedestrians only beyond this point.
300 N
Below the Dam
Minidoka Boat Ramp
Bishop's Hole Road
Bishop's Hole Launch Point
E 400 N
E 500 N
Bishop's Hole Toilet
Below the Spillway
0 100 200 400 600 800
Feet
Figure 2 - 7
Minidoka Dam Spillway Replacement
Recreation / Public Use Areas (Alt. B)
New Spillway and Headworks
New Service Roads
Existing Spillway
Existing Buoys
New Buoys
Existing Fence
Proposed/New Fence
Reclamation Land
National Wildlife Refuge
43 CFR Part 423
Part 423.36 & 37 (300 yard Zone)
Special Use Areas
Ice Fishing
Wading/Float Tubing
Historic Public Use Below The Dam
Historic Public Use Below The Spillway
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Filename: MDSR_Map6-7-8(B).mxd
Drawn by: J. Jones Date: Nov. 10, 2009

LAKE WALCOTT
N
Lake Walcott State Park
Staging Area
Rock & Soil Waste Area
Switchyard
Existing MID Headworks
North Side Canal Headworks (Replaces The Existing Structure)
NORTH SIDE CANAL
Minidoka Powerplant
Embankment Dam
Inman Powerplant
Minidoka Dam
Sewage Ponds
Staging and Waste Area
E300N
Snake River
Existing Radial Gates (No Change)
South Side Canal Headworks (Majority Removed)
New South Side Canal Headworks
Existing BID Headworks
Rock Wall and Dike
Existing Bridge
New Radial Gates
SOUTH SIDE CANAL
Gravity Canal Road
Staging and Waste Area
Staging Area
Bishop's Hole Road
E300N
0 100 200 400 600 800
Feet
Figure 2 - 8
Minidoka Dam Spillway Replacement
Staging, Waste Area & Construction Closure Points
Staging and Waste Areas
National Wildlife Refuge
Reclamation Land
Proposed/New Fence
Existing Fence
Existing Spillway
New Spillway and Headworks
New Buoys
Existing Buoys
Limits of Construction Zone (No Public Access)
Approx. Closing Points During Construction
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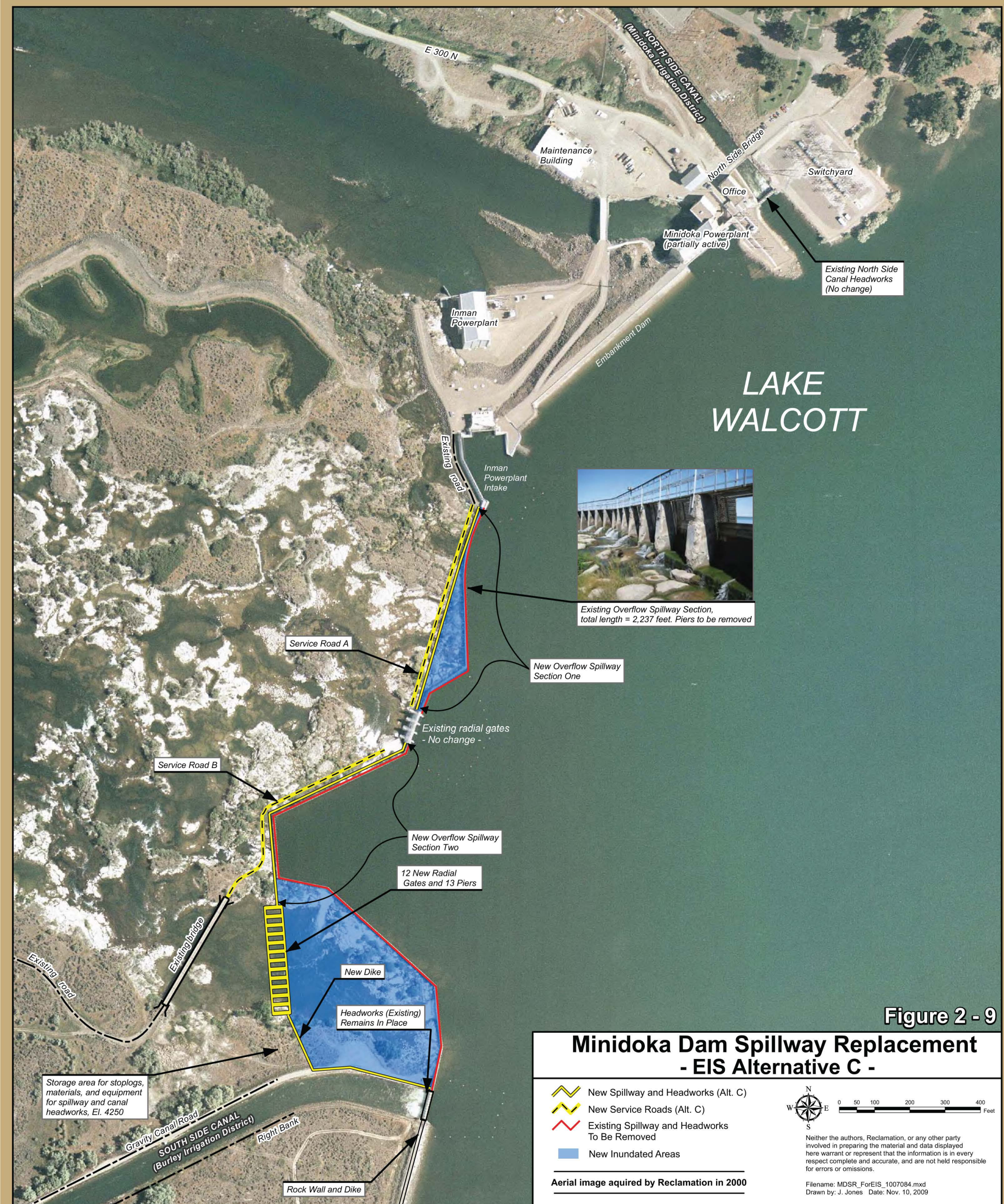
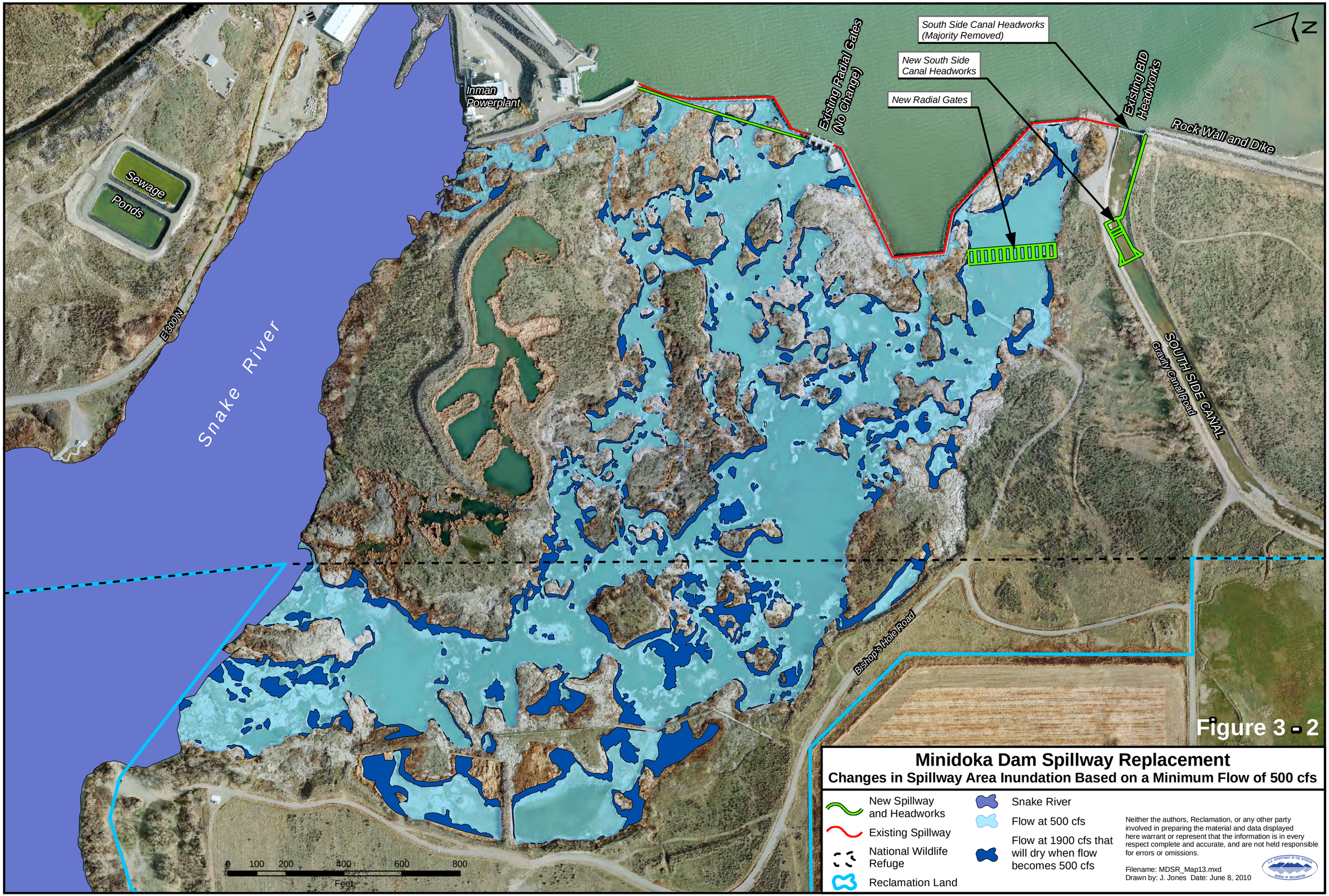
Filename: MDSR_Map4.mxd
Drawn by: J. Jones Date: Nov. 10, 2009


E 300 N
NORTH SIDE CANAL
(Minidoka Irrigation District)
Maintenance Building
North Side Bridge
Switchyard
Office
Minidoka Powerplant
(partially active)
Existing North Side Canal Headworks (No change)
Inman Powerplant
Embankment Dam
LAKE WALCOTT
Existing road
Inman Powerplant Intake
Existing Overflow Spillway Section, total length = 2,237 feet. Piers to be removed
Service Road A
New Overflow Spillway Section One
Existing radial gates - No change -
Service Road B
New Overflow Spillway Section Two
12 New Radial Gates and 13 Piers
Existing bridge
Existing road
New Dike
Headworks (Existing) Remains In Place
Storage area for stoplogs, materials, and equipment for spillway and canal headworks, El. 4250
Gravity Canal Road
SOUTH SIDE CANAL
(Burley Irrigation District)
Right Bank
Rock Wall and Dike
Figure 2 - 9
Minidoka Dam Spillway Replacement
- EIS Alternative C -
New Spillway and Headworks (Alt. C)
New Service Roads (Alt. C)
Existing Spillway and Headworks To Be Removed
New Inundated Areas
Aerial image aquired by Reclamation in 2000
N
W
E
S
0 50 100 200 300 400 Feet
Neither the authors, Reclamation, or any other party involved in preparing the material and data displayed here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.
Filename: MDSR_ForEIS_1007084.mxd
Drawn by: J. Jones Date: Nov. 10, 2009


Inman Powerplant
Existing Radial Gates (No Change)
South Side Canal Headworks (Majority Removed)
New South Side Canal Headworks
New Radial Gates
Existing BID Headworks
Rock Wall and Dike
Sewage Ponds
E300N
Snake River
SOUTH SIDE CANAL
Gravity Canal/Road
Bishop's Hole Road
N
0 100 200 400 600 800
Feet
Figure 3 - 2
Minidoka Dam Spillway Replacement
Changes in Spillway Area Inundation Based on a Minimum Flow of 500 cfs
New Spillway and Headworks
Existing Spillway
National Wildlife Refuge
Reclamation Land
Snake River
Flow at 500 cfs
Flow at 1900 cfs that will dry when flow becomes 500 cfs
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Filename: MDSR_Map13.mxd
Drawn by: J. Jones Date: June 8, 2010

LAKE WALCOTT
Lake Walcott State Park
Switchyard
Existing MID Headworks
North Side Canal Headworks (Replaces The Existing Structure)
NORTH SIDE CANAL
Minidoka Powerplant
Embankment Dam
E Minidoka Dam
Inman Powerplant
Snake River
Sewage Ponds
E 300 N
E 800 N
Existing Radial Gates (No Change)
(IS) Water released during Irrigation Season
(NIS) Water released during Non Irrigation Season.
50 cfs (IS) and 100 cfs minus seepage (NIS)
Releases through this point will be added to any natural seepage to result in 100 cfs minimum flow all year.
Example: If seepage is 20 cfs then 80 cfs will be released.
Existing BID Headworks
Rock Wall and Dike
South Side Canal Headworks (Majority Removed)
New South Side Canal Headworks
New Radial Gates
SOUTH SIDE CANAL
Gravity Canal Road
Bishop's Hole Road
N
0 100 200 400 600 800
Feet
Figure 3 - 3
Minidoka Dam Spillway Replacement
Snail Pool and All Year Release Point
New Spillway and Headworks
Existing Spillway
National Wildlife Refuge
Reclamation Land
Winter Release Flows
Water Release Point
Snail Pool
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Filename: MDSR_Map11.mxd
Drawn by: J. Jones Date: Nov. 9, 2009

N
Figure 3 - 4
Minidoka Dam Spillway Replacement
Winter Release Flow Pattern Based on Elevations
Existing Spillway
Winter Release Flows
New Spillway
0 100 200 400 600 800
Feet
Neither the authors, Reclamation, or any other party involved in preparing the material and data displayed here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.
Filename: MDSR_Map10.mxd
Drawn by: J. Jones Date: Nov. 9, 2009

Appendix C Groundwater Model Construction and Calibration

1. Model Development

The Minidoka Groundwater Model (MGM) was developed using MODFLOW, a groundwater modeling software package developed by the USGS (USGS, 2000). The MGM was a modified version of ESPAM1.1 (Cosgrove and others, 2006). The decision was made to modify the existing ESPA model because it is technically accepted by the Idaho Department of Water Resources.

Since it was determined that the RBPA is hydrologically disconnected from Lake Walcott it was not included in the model. In addition, only the portion of the Snake River just downstream of the dam was included in the model since further downstream, it is considered hydrologically disconnected from Lake Walcott. Any change in return flow to the Minidoka to Milner reach of the river are assumed to be due to changes immediately downstream of the dam:

- changes in seepage on the north side of the river,
- changes in returns to the river just downstream of the dam, and
- changes to seepage through the wetlands on the south side of the river

The MGM was designed to determine how much water will impact the river by way of seepage in the silty sand layer (Model Layer 1); how much water will impact the river just downstream of the dam (represented in Layer 2); and how much water will impact the regional aquifer (Layer 2).

Other modifications to the ESPAM1.1 model include:

- The MODFLOW flow package was converted from the Block-Centered Flow (BCF) package to the Layer Property Flow (LPF) package.
- The model grid was modified to give greater resolution near the Dam.

Recharge was assumed to be the same as recharge in ESPAM1.1.

2. Layering

A layer was added to ESPAM1.1 to represent the silty sand layer on the north side of the dam and reservoir. The layer (Layer 1) is limited to the extent of the silty sand interbed on the north side of the reservoir that is believed to be a geologic pathway for seepage (Figure 1).

Figure 1. Model representation of the silty sand layer (Layer 1) on the north side of Lake Walcott.

Layer 1 extends upstream along the reservoir to correspond to the eolian sand deposits as mapped by Scott (1982). The bottom of the silty sand layer is at elevation 4160 near the dam and slightly decreases to 4150 downstream from the dam (Buehler and Carter, 1985). The top of the layer is represented by land surface elevation from 30 meter digital elevation models (DEM) (USGS, 1999a-i).

The MODFLOW flow package was converted from the BCF package to the LPF package to allow for better representation of the additional model layer. In the ESPAM1.1 model, the regional aquifer has a top elevation of 6000 feet and a bottom elevation of 2000 feet. In the MGM, the aquifer bottom elevation was left unchanged at 2000 feet but the top elevation was converted to the top of land surface elevation. In the area of the new layer, the bottom of the new layer was used as the top elevation of layer 2.

Transmissivity was converted to hydraulic conductivity by dividing the transmissivity values by the new thickness of the aquifer layer. The storage coefficient values were converted to specific storage by dividing the values by the thickness of the model layer. Hydraulic properties of the new Layer 1 were determined by the calibration process, but were limited by known estimates of silty sand properties.

2.1 Grid and Vertical Datum

The Eastern Snake Plain Aquifer model grid was refined in the area near Minidoka Dam to allow for better resolution in the area of interest for the MGM. The ESPAM1.1 grid has grid cells that represent one mile by one mile. The MGM grid was telescoped down to grid cells that represent 165 feet by 165 feet (Figure 1and Figure 2).

All vertical elevations in this report are with respect to North American Vertical Datum (NAVD) 1988. To correct to the local Minidoka Dam vertical datum, add 49.67 feet to all elevations.

2.2 Steady-state and Transiet Models

Both steady-state and transient versions of the MGM were developed for this project. The steady-state model was developed similarly to the steady-state ESPAM1.1 model by using average water level conditions from 1980 to 2002 (Cosgrove and others, 2006). The solution to the steady-state MGM was used as the starting head condition for the transient model.

The transient MGM used six month stress periods and simulates the historical period from May 1980 to April 2002. The stress periods start in May and November and the values for each stress period represented average historical values during each six month period.

2.3 River, General Head, and Drain Features

River and drain features that existed in ESPAM1.1 were not changed in the MGM outside the area of interest. Near the dam, river features were added to more accurately represent Lake Walcott and the river just downstream of the dam (Figure 2).

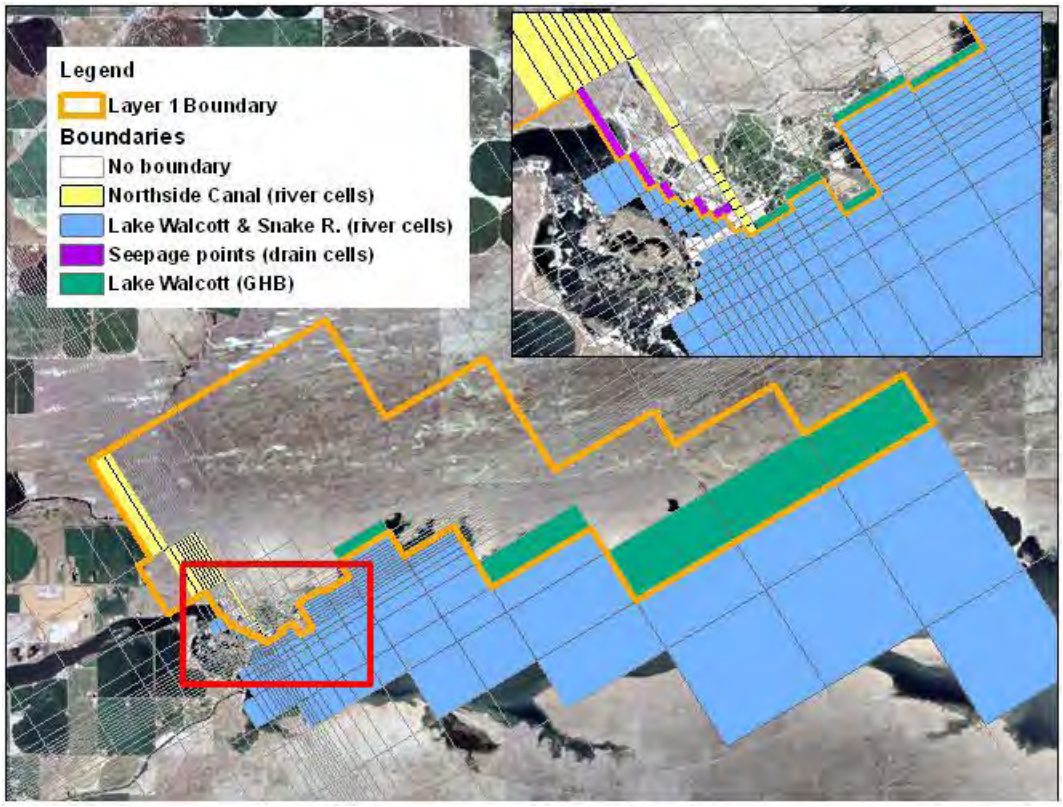


Figure 2. Boundary conditions in Layers 1 and 2 near Lake Walcott. The orange line designates the location of Layer 1; no boundary conditions exist in Layer 2 below Layer 1.

The bottom elevation of the reservoir was represented at elevation 4114 feet. The stage was 4195 feet for the steady-state model and varied in six month average elevations for the transient model (Table 1).

The Snake River downstream of the dam was included for a distance of 2200 ft (Figure 2). The water surface elevations of the river in the transient model are shown in Table 1. River features were also added to represent the Northside canal since it is assumed to be a large contributor to seepage. The bottom of the Northside canal is at 4185 feet. In the steady-state model, the canal was assumed full and, in the transient model, the stage varied from elevation 4195 feet during the irrigation season to 4185 feet (or empty) during the non-irrigation season.

General head boundary (GHB) features were used to represent Lake Walcott in the silty sand layer (Layer 1). A GHB boundary is essentially a river boundary where the bottom elevation of the feature is the bottom elevation of the cell. This condition closely represents the behavior of the reservoir in the silty sand layer. The GHB features were added along the south end of the layer, where the reservoir is located. The GHB water level was 4195 feet in the steady-state model and varied in six month average elevations in the transient model (Table 1).

Table 1. Lake Walcott and Snake River elevations for transient model.

Stress Period		Water Surface Elevation (feet)	
No.	Starting Month	Lake Walcott*	Snake R. below Dam
1	May-80	4196.09	4138.33
2	Nov-80	4190.1	4135.29
3	May-81	4195.47	4138.33
4	Nov-81	4189.5	4135.29
5	May-82	4195.58	4143.27
6	Nov-82	4190.9	4135.87
7	May-83	4196.04	4144.05
8	Nov-83	4190.21	4135.72
9	May-84	4196.05	4144.39
10	Nov-84	4190.04	4136.22
11	May-85	4195.52	4142.79
12	Nov-85	4190.22	4136.54
13	May-86	4195.59	4144.09
14	Nov-86	4189.97	4135.76
15	May-87	4195.64	4139.69
16	Nov-87	4189.99	4134.41
17	May-88	4195.51	4139.76
18	Nov-88	4189.5	4134.72
19	May-89	4195.56	4139.98
20	Nov-89	4188.59	4134.82
21	May-90	4195.56	4139.93
22	Nov-90	4189.1	4134.54
23	May-91	4195.64	4140.12
24	Nov-91	4189.49	4134.53
25	May-92	4195.66	4139.54
26	Nov-92	4189.95	4134.51
27	May-93	4195.68	4139.54
28	Nov-93	4188.42	4135.96
29	May-94	4195.59	4144.19
30	Nov-94	4189.91	4134.5
31	May-95	4195.62	4145.84
32	Nov-95	4185.57	4135.94
33	May-96	4195.57	4142.81
34	Nov-96	4189.34	4135.86
35	May-97	4195.72	4147.48
36	Nov-97	4189.1	4136.64
37	May-98	4195.66	4147.48
38	Nov-98	4189.49	4136.92
39	May-99	4195.65	4143.55
40	Nov-99	4189.34	4135.6
41	May-00	4195.65	4140.07
42	Nov-00	4189.91	4134.74
43	May-01	4195.58	4139.52
44	Nov-01	4189.94	4134.78

Drain features were added to Layer 1 along the river where seepage has been observed (Figure 2). The bottom elevations of the drain features were determined from their mapped elevations.

2.4 No-flow Boundaries

Layer 1 was designed to represent the silty-sand layer that is assumed to be the pathway for seepage from Lake Walcott. The silty-sand layer exists only in the small region in which it is represented in the model. The geologic layer pinches out to the north, east and west so those respective boundaries are represented as no-flow boundaries.

3. Model Calibration

The model was calibrated using parameter estimation software PEST (Doherty, 2004) combined with trial and error. Parameters that were extracted from ESPAM1.1, hydraulic conductivity and specific storage of Layer 2, river and drain conductance outside the area of interest, and recharge, were not changed during the calibration process.

3.1 Calibration Observations

The model was calibrated to piezometer and seepage observations that were measured near the dam for dam safety purposes (Figure 3).

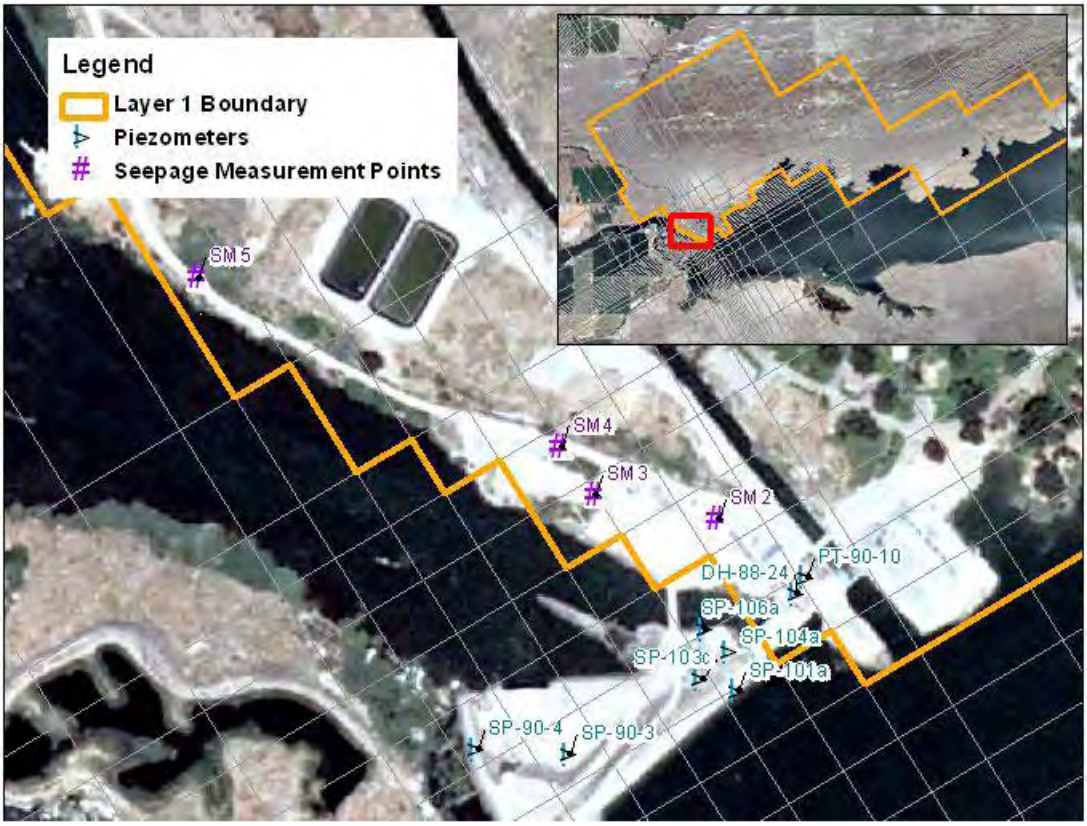


Figure 3. Locations of piezometer and seepage observation points for calibration.

Table 2 shows shows the steady-state water level and seepage measurements used in calibration. For the steady-state model, piezometer observations represented average water level measurements. Water level elevations in layer one are about 40-60 feet higher than those in layer two. Seepage observations were taken from an average water year, just after the canal was filled for the irrigation season. Average seepage measurements are generally less than one cubic feet per second (cfs).

Table 2. Table of steady-state observations used in calibration process.

	Measurement Point Name	Flow ($feet^3$/day)	Model Layer
Seepage	SM2	486	1
	SM4	13958	1
	SM5	60231	1
		Head (feet)	
Water Level Elevation	DH88-24	4168	1
	PT-90-10	4173	1
	SP-101A	4130	2
	SP-103AC	4132	2
	SP-104A	4130	2
	SP-106A	4130	2
	SP-90-3	4118	2
	SP-90-4	4115	2

For the transient model, six month averages of the piezometers water level measurements were calculated for all available data from 1980 to 2002 (Figure 4). The same was done for the seepage measurements (Figure 5).

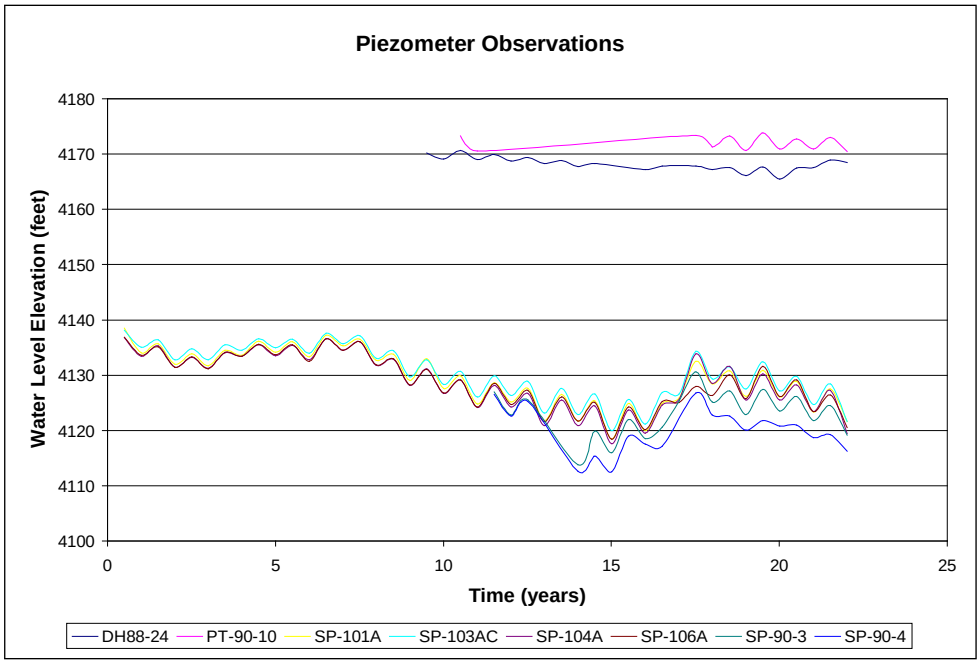


Figure 4. **Graph of time dependant water level elevations in observation piezometers.**

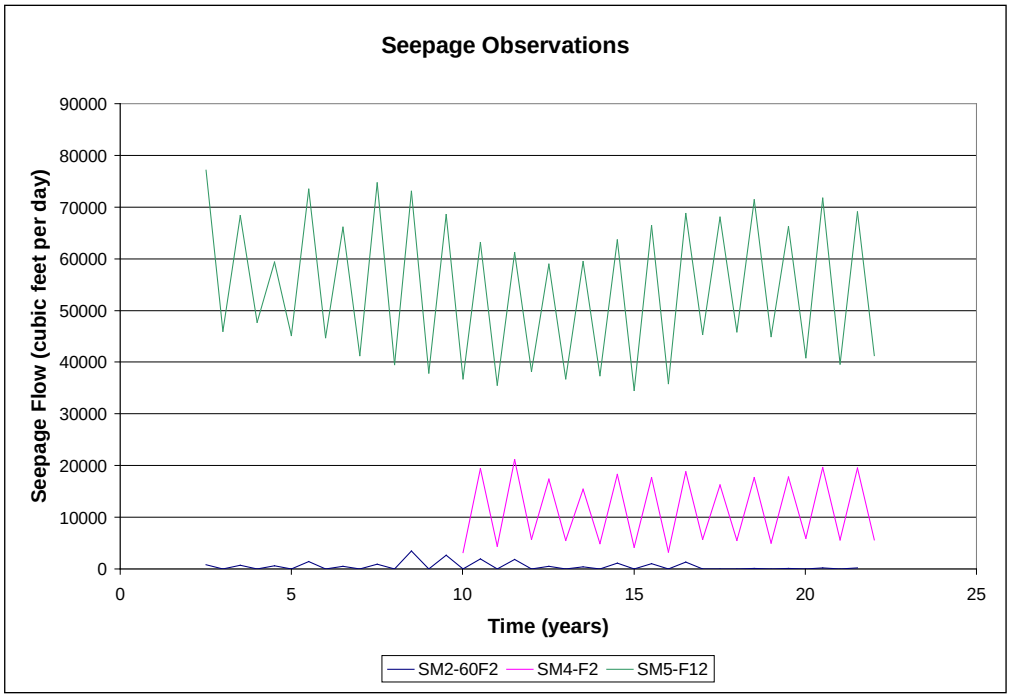


Figure 5. **Graph of time dependant seepage flows at seepage observation points.**

3.2 Estimated Parameters and Sensitivity

3.2.1 Hydraulic Conductivity and Storage

Estimated parameters included the hydraulic conductivity of Layer 1, river and drain conductance of the updated river and drain features, and specific yield of Layer 1 during the transient simulation. It was assumed that the hydraulic conductivity and specific yield of the sand layer was uniform throughout most of the layer (zone 1), except for a small region near the dam that was most likely disturbed during construction (zone 2) (Figure 6). Table 3 shows the hydraulic parameters and their estimated values for both the steady-state and transient models.

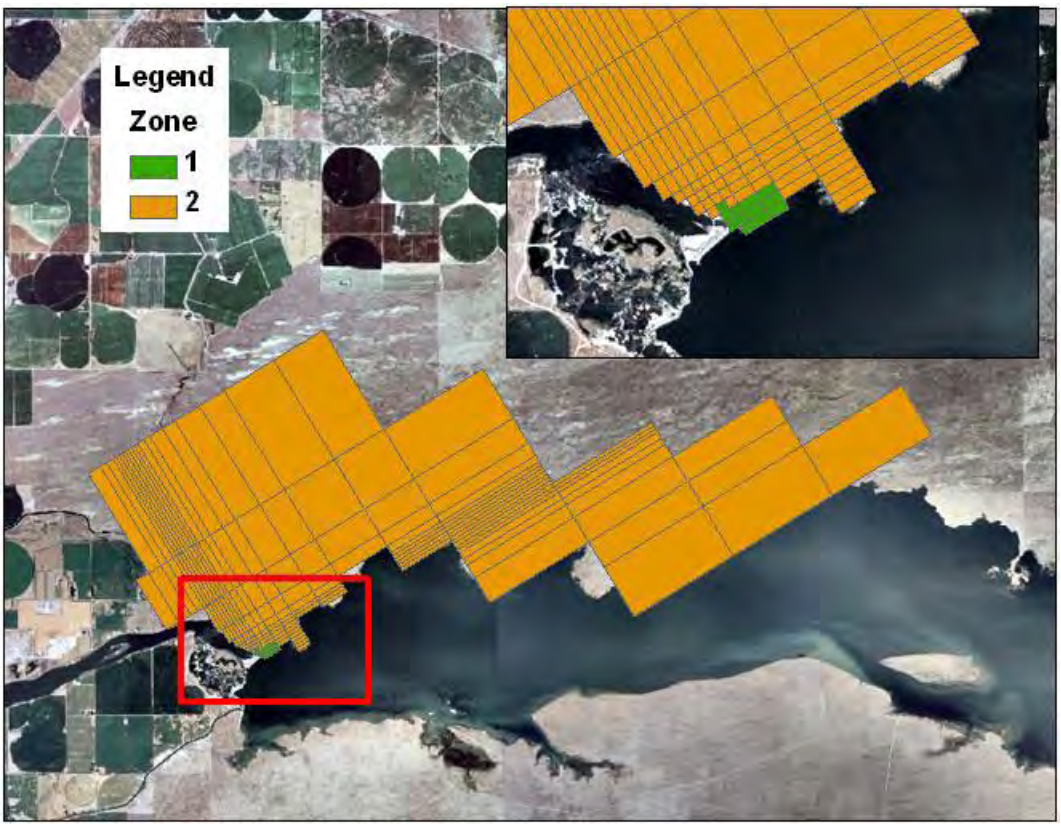


Figure 6. Map of hydraulic conductivity zones.

Table 3. Calibrated values for hydraulic conductivity.

Zones	Hydraulic Conductivity (feet/day)		Storage
	Horizontal	***Vertical***	***Specific Yield***
1	70	5.00E-06	2.00E-01
2	1.1	0.007	2.00E-01

3.2.2 Conductance

Zones were designated for the river cells based on location and feature size (Figure 7). All of the conductance values were determined during the calibration process and are shown in Table 4. River conductances vary for zone 1and zones 3 through 8 due to varying length and width of the canal feature being represented; the vertical hydraulic conductivity of the canal bottom for these features is 0.005 ft/day for zone 5 and 0.45 ft/day for the remaining zones. Conductance (shown in Table 4) is equivalent to hydraulic conductivity multiplied by the length and width of the feature divided by the bed thickness. The differences between the zones is likely due to concrete lining at the entrance of the canal (zone 5) and no lining further down the canal. Zone 1 represents the portion of the canal that was previously lined, but the concrete is considered degraded and leaky.

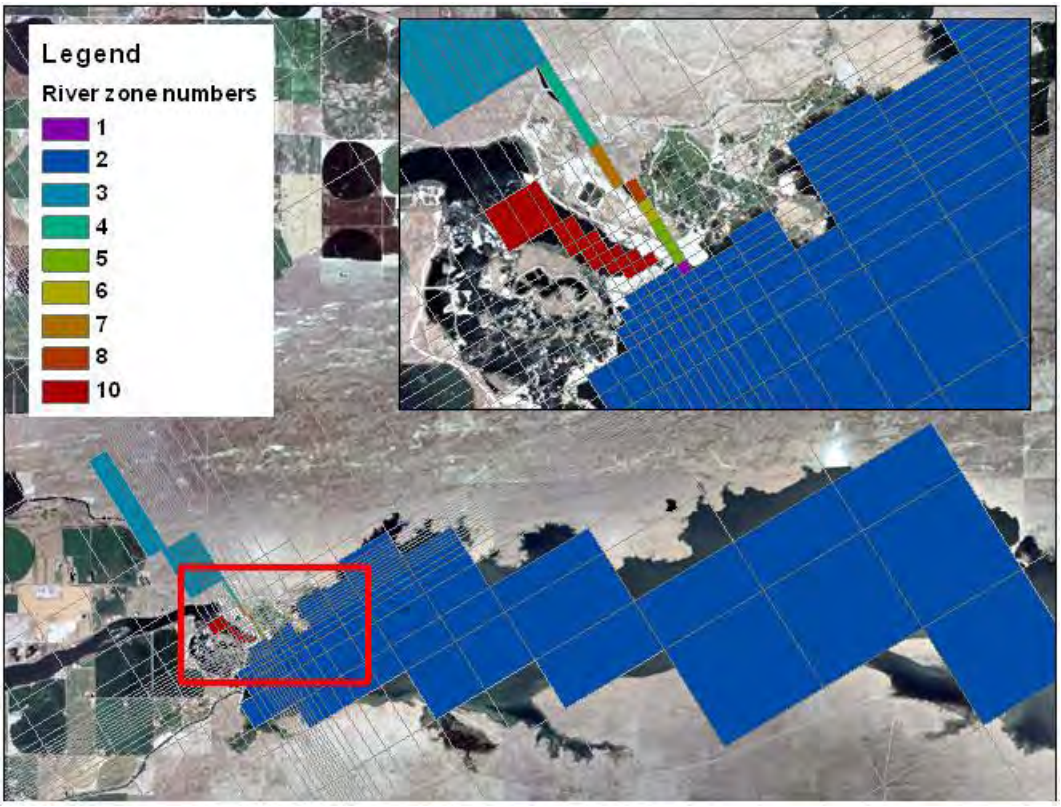


Figure 7. River zone locations.

The conductance rate of the river cells that represent Lake Walcott (zone 2) were estimated during calibration to be 824 ft2/d. The conductance rate of the cells that represent the river just below the dam (zone 10) were estimated to be 10,000 ft2/d. The estimated conductance of the GHB boundary that represents the reservoir in layer 1 is 9584 ft2/day.

Conductance for drains varied with the calibration process and is likely due to differing surface conditions where the water comes to the surface. For example, the surface may be more tightly compacted at one drain location versus another.

Table 4. Calibrated values for drain, river and GHB conductance.

Drain	Conductance
SM2	2000
SM4	1826
SM5	4771
River Zone	Conductance
1	743
2	824
3	1350
4	5940
5	33
6	743
7	743
8	1485
10	10000
GHB	Conductance
1	9584

3.3 Model Uncertainty

A numerical model represents a simplification of a complex natural system. The goal when developing a model is to minimize the unknowns and attempt to represent reality as closely as possible, while recognizing that a certain amount of uncertainty is inherent in the modeling process.

Uncertainty is often used as a synonym for model error. Many factors can contribute to model error, including error in the input data, hydrologic parameter variation, numerical error in the simulation, and error in observation data. These errors can compound or cancel each other. It is important to understand the error in the model output so that decision makers can appropriately utilize the output data.

Since this model is built upon the existing ESPAM1.1 model, uncertainty was only analyzed with respect to the new additions to the model.

Determining the sensitivity of model parameters can help quantify model uncertainty. Sensitive parameters are those that cause a large change in the model solution when their values are varied; while insensitive parameters can be varied by large amounts and not affect the solution. MODFLOW 2000 calculates the sensitivity of each parameter using a forward- or central- difference approximation (Harbaugh and others, 2000). The sensitivities are presented in two ways, composite scaled sensitivities (CSS) and dimensionless scaled sensitivities (DSS). CSS values were plotted in a bar chart to show the relative sensitivity of each parameter (Figure 8).

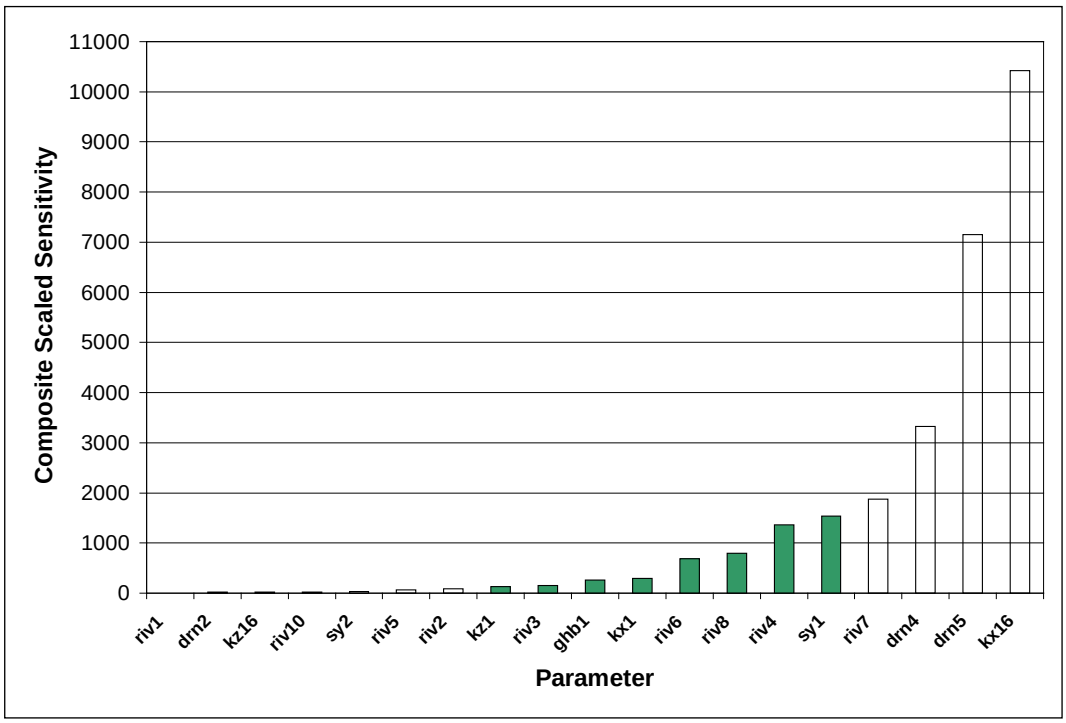


Figure 8. Plot of CSS values for Minidoka groundwater model.

Parameters that are less than 1 percent of the largest CSS value are considered not sensitive. Since the maximum CSS for this model is about 10,400 for parameter kx16, the sensitive parameters are those with CSS greater than 104. The sensitive parameters in this model are

- vertical hydraulic conductivity zone 1 (kz1),
- river conductance zone 3 (riv3),
- General Head Boundary Zone 1 (ghb1),
- horizontal hydraulic conductivity zone 1 (kx1),
- river conductance zone 6 (riv6),
- river conductance zone 8 (riv8),
- river conductance zone 4 (riv4),
- storativity zone 1 (sy1),
- river conductance zone 7 (riv7),
- drain conductance zone 4 (drn4),
- drain conductance zone 5 (drn5), and
- horizontal hydraulic conductivity zone 16 (kx16).

DSS values were plotted in a line graph to show the relative importance of each parameter to an observation based on its sensitivity (Figure 9). Observations with DSS values that are large with respect to the other observations are considered sensitive with respect to the corresponding parameter. For example, the parameter River Zone 2 is important to the estimation of the piezometers in layer 2 but not the piezometers in layer 1 nor the seepage estimates

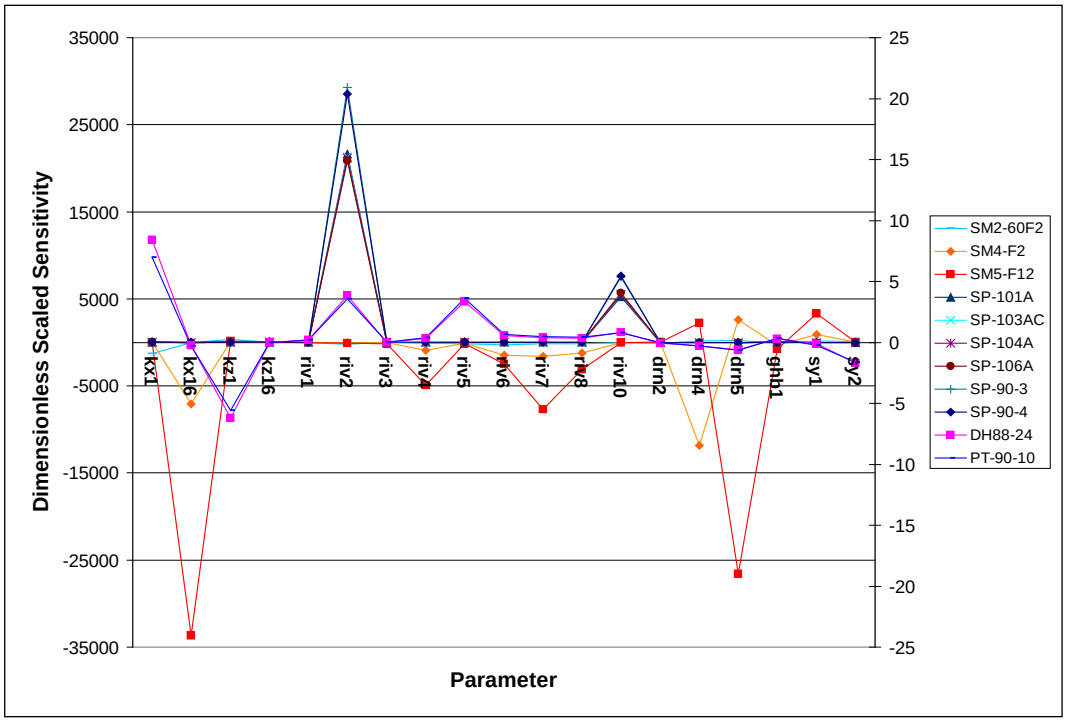


Figure 9. Plot of dimensionless scaled sensitivities for each estimated parameter in the model. The left y-axis represents the DSS for observations SM2, SM4, and SM5. The remaining observations are reflected on the right y-axis.

The CSS and DSS values can help to determine which parameters are important to developing a well calibrated model. Estimates of parameters with low DSS and CSS values are not necessary for a well calibrated model because a low DSS means that none of the observations depend on the parameter and a low CSS means that the model is not sensitive to changes in the parameter. The parameters in this model that do not have a high DSS (or high importance) are vertical hydraulic conductivity for zone 16, river conductance for zones 1 and 3, drain conductance for zone 2 and GHB conductance for zone 1. Of these parameters, GHB for zone 1 and river conductance for zone 3 are considered slightly sensitive, so changes may result in a different solution, but not at the observation points. It is often recommended that such parameters be set with a fixed value during the calibration process since changes will have little effect on the solution.

Parameters with low CSS values and high DSS values can contribute to the uncertainty of a model. This is because parameters with low CSS values can be changed by large amounts without affecting the solution at the observation point. However, the high DSS value indicates that the estimate of that particular observation is dependant on a good estimate of that non-sensitive parameter . It is possible to calibrate the model to parameters with low CSS; however, a large range of estimates for that parameter often results in a good calibration of the model. So, although the model appears to be well

calibrated, predictions made with that model version may not be. Parameters that fall into the category of having a large DSS and small CSS (or a high importance, but low sensitivity) for this model are river conductance for zones 2, 5, and 10 and storativity for zone 1. To account for this issue, it is common to use a range of values for each parameter during the prediction portion to give a range of possible solutions to the problem. Since in this model they are all on the low end of the CSS chart, changes to the parameters did not affect the solution to any large degree, therefore, it was not necessary to use a range of values.

3.4 Calibration Model Fit

The quality of model calibration is determined by the residuals, which are the differences between observed and simulated water levels and flow measurements. For the steady-state model, the residual standard deviation of the water levels is 4.10, which indicates that there is a 95% chance that the simulated water levels will be within 4.10 feet of the observed water levels. The percent of the total range of observed water levels is 7.3. For calibration purposes, it is considered reasonable for the residual standard deviation percent of the range to be up to 10 percent. The residual standard deviation of the seepage flow at the drains is 4555.01 feet per day which is 7.6 percent of the total range in seepage flow.

Figure 10 shows the steady-state base case Minidoka model contours compared to the ESPAM 1.1 model contours. The contours are similar and differences likely result from the conversion of the BCF to LPF package.

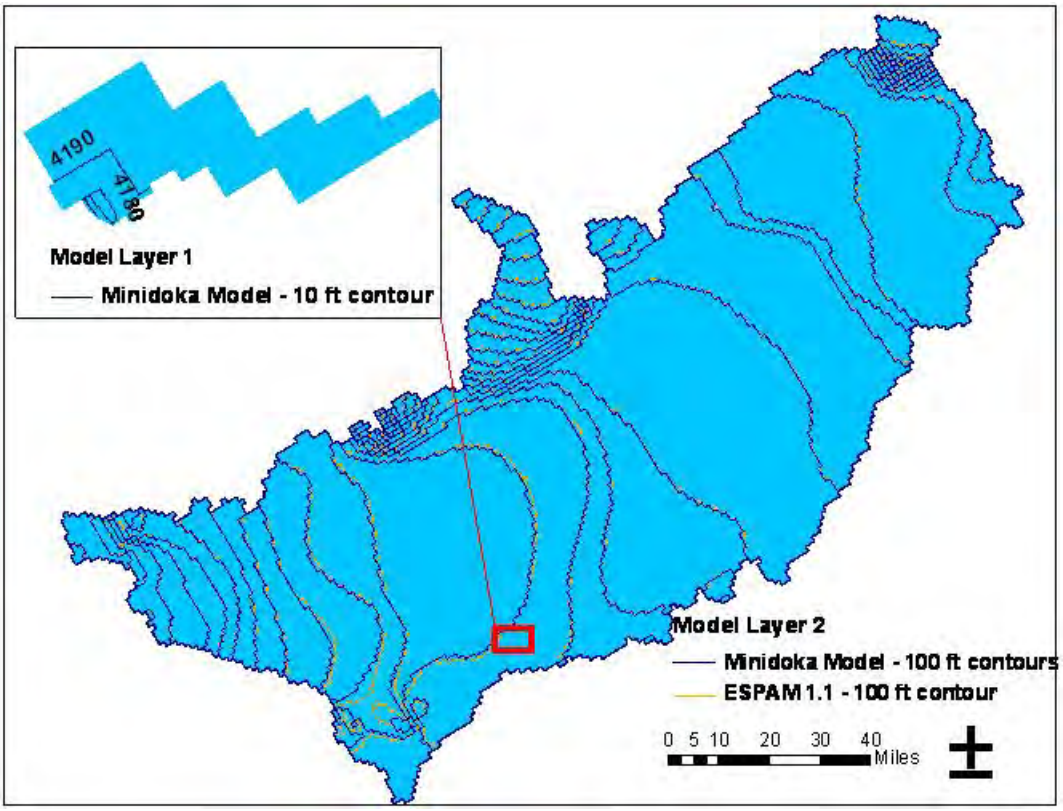


Figure 10. Base case contours compared to ESPAM model results.

The observed versus simulated values for the steady-state calibrated model are presented in Table 2-4.

Table 5. Observed versus simulated values for steady-state calibrated model.

	Name	Observed	Simulated	Residual
Water Levels (feet)	*DH-88-24*	4168	4166	3
	PT-90-10	4172	4168	4
	SP-90-4	4116	4124	-8
	SP-90-3	4119	4125	-6
	SP-101a	4127	4126	2
	SP-104a	4127	4125	2
	SP-106a	4127	4125	2
	SP-103c	4129	4125	4
Seepage (cubic feet per day)	*SM2*	-400	-1303	903
	SM4	-14000	-16364	2364
	SM5	-60000	-71213	11213

For the transient model, the residual standard deviation of the water levels is 2.88, which is 4.7 percent of the range of observations. The residual standard deviation of the seepage flow at the drains is 4148.51 feet per day, which is 5.4 percent of the range. Figure 11 is a scatter plot of the observed versus simulated water levels for the transient model. For a best fit, all values would fall in a straight line with a slope of 1 and intercept at 0 (indicated by the dashed line on the Figure 11). A regression line for water levels has a slope of 1.055 and y-intercept of -230.65.

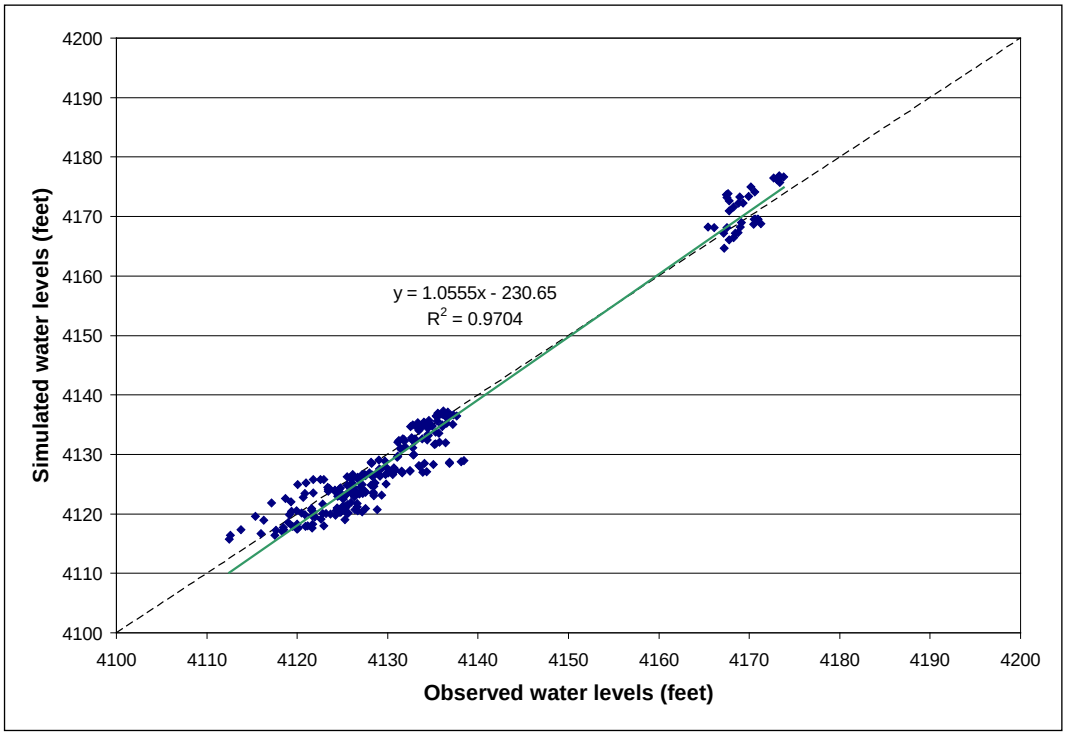


Figure 11. Observed versus simulated water levels.

Figure 12 is a plot of the observed versus simulated seepage flows at the drains. A regression line of the flow data has a slope of 0.9349 and y-intercept of 2916.9.

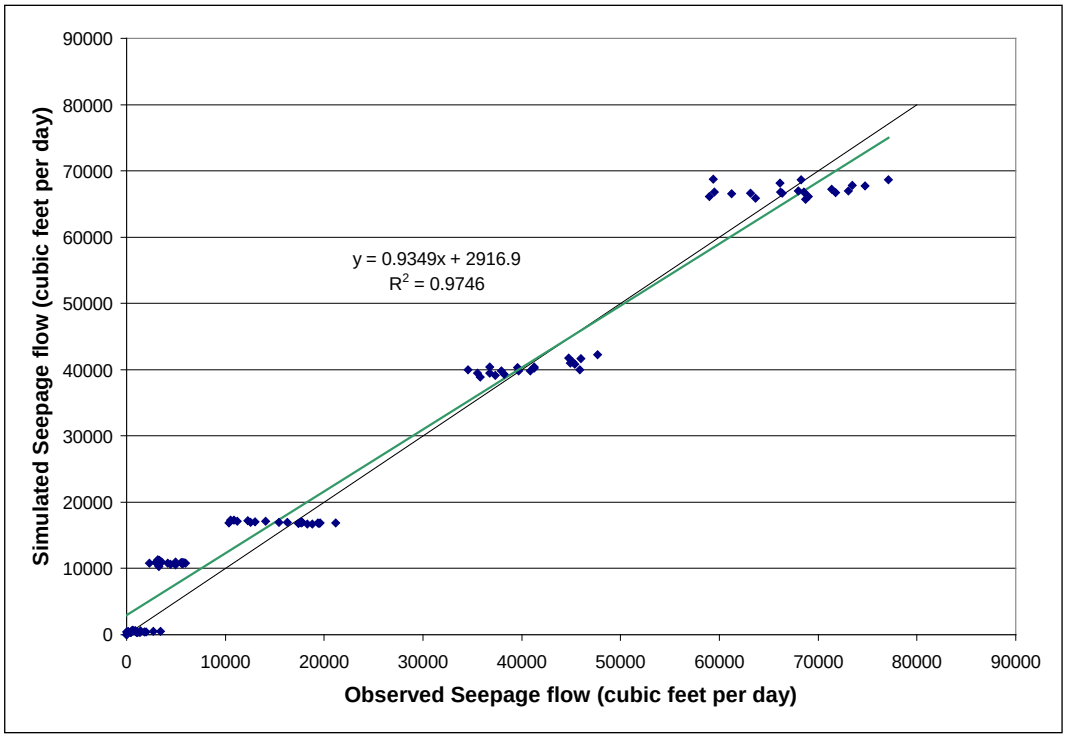
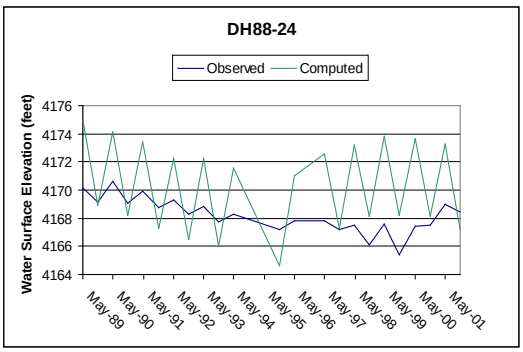
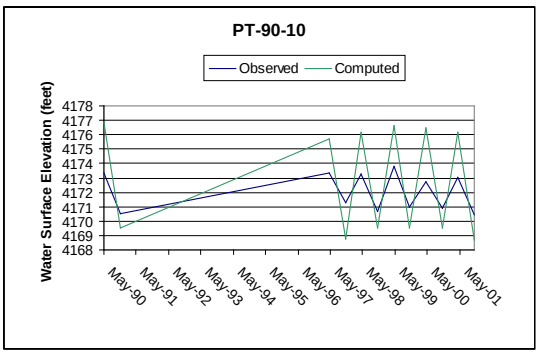


Figure 12. Observed versus simulated seepage flow.

Figure 13 shows the calibrated observed and modeled time series at the observation points. Data points that are not included in the observed time series are omitted from the computed time series. For the most, the computed values match the observed values. DH88-24 has a larger change in head values from one stress period to the next because it is in a cell that is along the boundary of the model.





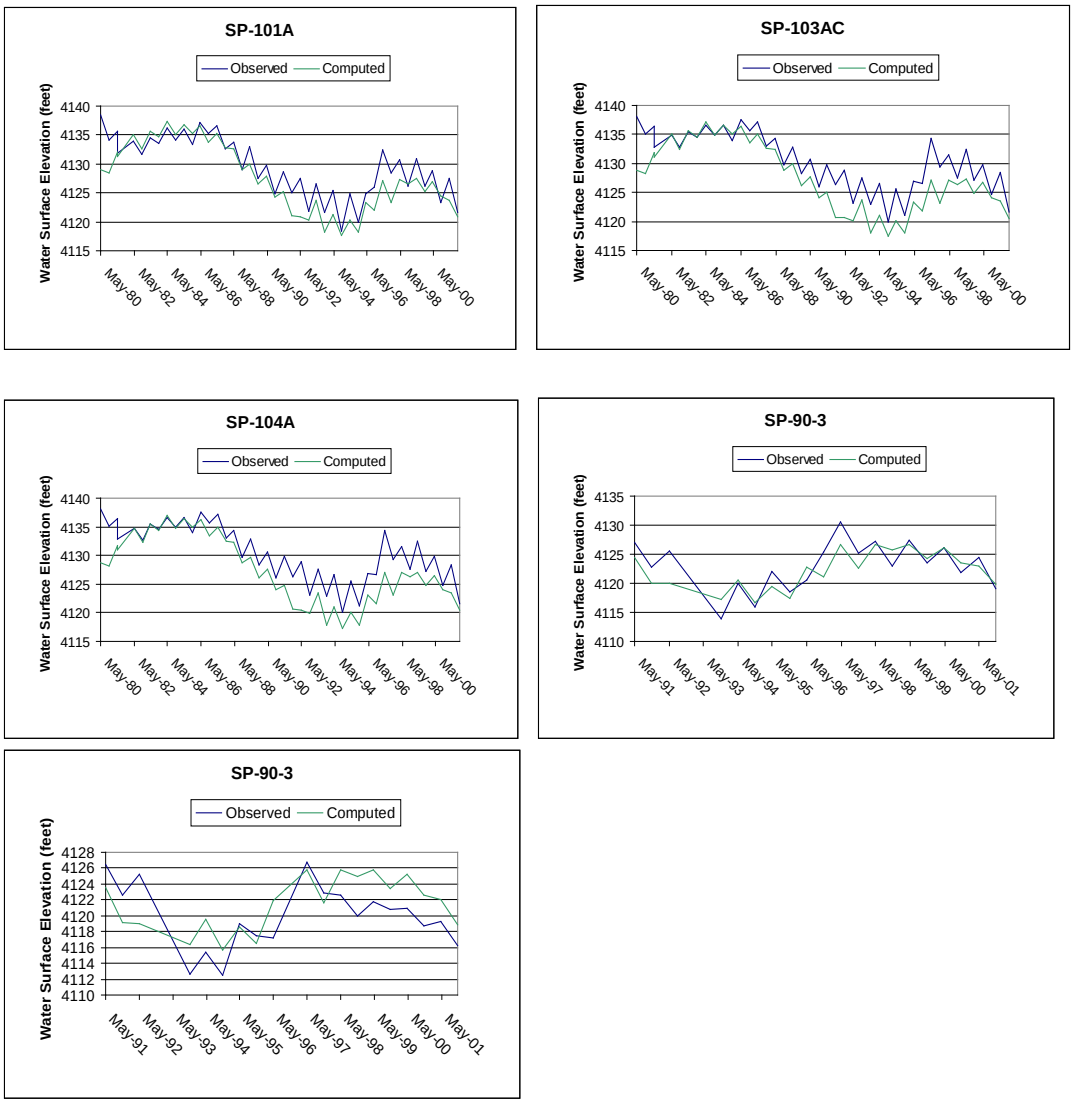


Figure 13. Observed versus calculated water level measurements in piezometers near Minidoka dam.

Figure 14 shows the observed and computed time series of the seepage points along the north side of the river.

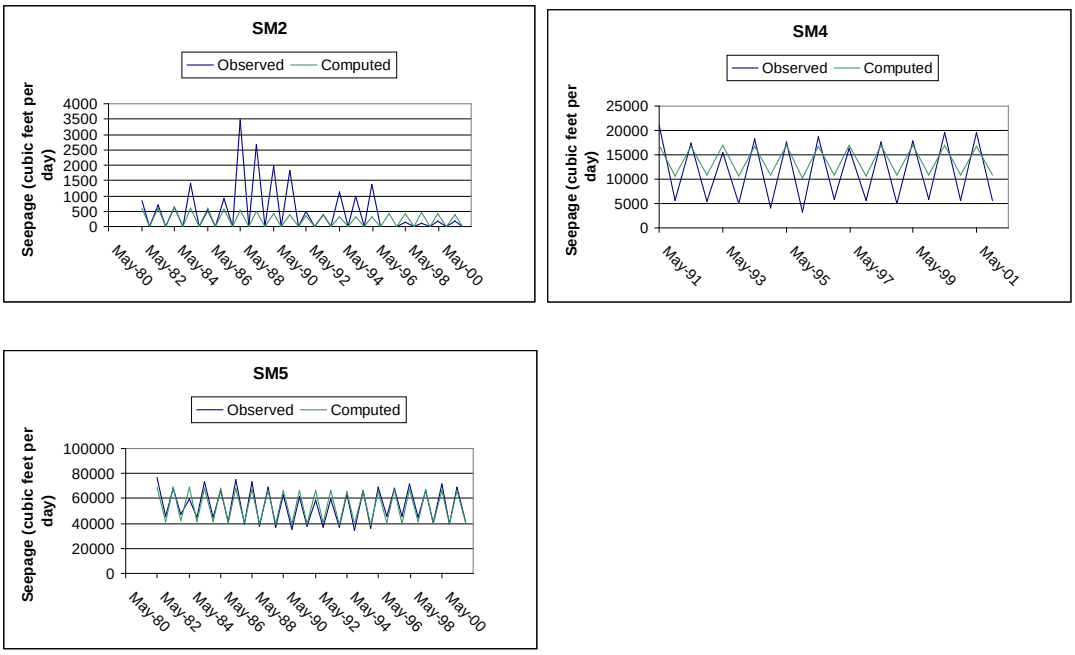


Figure 14. Observed versus computed seepage at measurement points near Minidoka Dam.

The majority of the seepage from the reservoir flows downward, to the regional aquifer with a relatively small amount flowing through the silty sand layer to the river. The water that does flow to the river originates from upstream on the reservoir, flows under the Northside canal, and daylights at the seepage measurement points along the river. Seepage from the Northside canal itself also contributes to the flow measured at the seepage measurement points. Most of the seepage is collected at SM5, which is many times larger in volume than SM4 and SM2.

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Appendix D Hydrology Studies

Historical monthly average flows below Minidoka obtained from Hydromet													
UNITS: cfs													
Water Year/Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1991	2,515	502	547	1,274	476	499	2,606	6,129	8,063	9,660	9,542	6,620	**4,036**
1992	2,631	442	798	947	503	550	4,803	7,575	7,475	7,673	7,263	3,458	**3,676**
1993	1,703	439	635	839	513	557	1,174	6,967	11,909	10,205	9,285	6,728	**4,246**
1994	3,477	1,589	2,384	2,388	2,074	2,575	5,987	8,435	9,844	10,941	8,165	5,923	**5,315**
1995	1,860	593	513	651	483	412	2,467	11,438	14,095	10,878	9,917	7,568	**5,073**
1996	3,307	2,219	3,045	4,425	7,407	16,474	16,037	12,265	15,210	10,957	9,657	6,675	**8,973**
1997	3,907	2,462	3,424	8,863	18,121	20,023	16,027	15,732	32,373	11,614	11,638	12,867	**13,087**
1998	10,169	6,461	7,940	6,600	7,337	7,871	11,490	16,183	16,140	11,303	10,126	7,711	**9,944**
1999	4,922	4,804	8,297	8,396	8,270	8,254	12,417	15,990	19,237	10,558	9,735	7,650	**9,877**
2000	5,633	3,770	4,527	6,814	2,704	3,204	8,245	7,929	9,441	10,594	9,829	6,876	**6,631**
AVERAGE	**4,012**	**2,328**	**3,211**	**4,120**	**4,789**	**6,042**	**8,125**	**10,864**	**14,379**	**10,438**	**9,516**	**7,207**	**7,086**

Modsim Model Output of monthly average flows below Minidoka under Alternative A: No Action													
UNITS: cfs													
Water Year/Month	Oct	Novr	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1991	2,774	504	489	488	540	607	2,798	7,160	9,271	9,840	9,195	6,712	4,198
1992	2,701	2,094	1,999	488	540	488	4,975	7,825	7,740	7,676	5,440	2,299	3,689
1993	1,791	504	488	488	597	488	899	14,430	8,562	9,823	8,405	6,808	4,440
1994	3,539	2,110	1,958	922	1,241	646	5,310	7,913	9,422	9,454	7,673	5,716	4,659
1995	1,832	514	491	826	972	488	5,908	12,433	14,120	10,090	8,558	7,376	5,301
1996	3,993	2,339	6,929	8,899	10,700	7,965	15,648	15,281	13,088	11,544	9,581	7,571	9,461
1997	4,936	2,296	2,185	11,209	11,540	10,095	18,683	26,868	26,689	14,637	9,572	7,500	12,184
1998	9,958	7,822	6,964	12,677	7,590	5,788	10,347	14,822	16,315	12,528	8,934	7,122	10,072
1999	4,033	5,817	6,521	9,220	10,305	11,819	10,605	14,637	19,955	13,826	9,778	7,781	10,358
2000	4,946	2,128	2,035	4,058	5,095	4,743	7,674	8,777	10,240	9,837	8,498	6,268	6,191
AVERAGE	4,050	2,613	3,006	4,927	4,912	4,313	8,285	13,015	13,540	10,926	8,563	6,515	7,055
note: for months with 31 days, the minimum flow calculation is slightly less than the 500cfs stipulated in the model constraints.													

Modsim Model Output of monthly average flows below Minidoka under Alternative A: No Action													
Historical monthly average flows below American Falls Dam obtained from Hydromet													
UNITS: cfs													
Water Year/Month	Oct	Novr	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1991	2,712	390	381	1,202	392	389	4,366	7,557	11,554	12,942	12,310	7,414	5,134
1992	2,626	341	649	798	537	1,118	7,247	10,365	9,656	9,568	8,107	3,762	4,565
1993	2,401	340	514	689	319	306	1,951	9,097	14,585	12,677	11,193	8,456	5,211
1994	3,063	1,458	2,193	2,137	1,959	3,518	7,177	10,223	12,222	12,829	9,838	6,836	6,121
1995	1,963	397	327	420	315	1,142	3,224	12,412	15,720	12,245	11,406	8,784	5,696
1996	2,456	1,847	2,983	4,467	7,958	17,000	16,990	13,748	18,303	13,510	11,810	7,929	9,917
1997	4,405	1,473	3,178	8,965	18,079	19,935	16,960	17,361	35,583	13,616	13,284	13,557	13,866
1998	9,240	6,343	7,605	6,383	7,258	8,822	12,190	17,594	18,317	13,658	12,258	8,962	10,719
1999	4,043	4,637	7,937	7,937	7,920	8,942	12,669	17,548	22,963	13,071	11,635	8,985	10,691
2000	5,076	3,618	4,361	6,725	2,479	3,991	9,129	9,630	12,043	13,174	11,665	7,409	7,442
AVERAGE	3,799	2,084	3,013	3,972	4,721	6,516	9,190	12,554	17,095	12,729	11,351	8,209	7,936

Modsim Model Output of monthly average flows below American Falls Dam under Alternative A: No Action													
UNITS: cfs													
Water Year/Month	Oct	Novr	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1991	2,088	400	342	454	448	1,379	3,863	8,640	12,762	13,253	12,004	8,125	5,313
1992	2,264	2,017	1,952	441	483	1,447	7,203	10,721	9,913	9,500	6,334	2,168	4,537
1993	2,245	483	455	393	432	1,089	1,125	16,420	11,271	12,384	10,330	8,664	5,441
1994	3,061	2,017	1,952	834	899	1,548	6,615	9,735	11,821	11,407	9,737	6,149	5,481
1995	1,931	353	342	635	829	1,358	6,607	13,414	15,770	11,484	10,069	9,067	5,988
1996	3,325	2,017	6,840	8,686	10,681	9,000	16,464	16,786	16,175	14,096	11,772	9,060	10,408
1997	4,543	2,017	1,952	10,951	11,455	10,890	19,243	28,611	29,792	16,694	11,208	8,260	12,968
1998	8,970	7,673	6,709	12,483	7,483	6,744	11,129	16,289	18,520	14,842	11,066	8,386	10,858
1999	3,225	5,656	6,119	8,825	9,865	12,583	10,867	16,146	23,641	16,361	11,703	9,130	11,177
2000	4,306	2,017	1,952	3,907	4,855	5,612	8,501	10,508	12,831	12,412	10,323	7,206	7,036
AVERAGE	3,596	2,465	2,861	4,761	4,743	5,165	9,162	14,727	16,250	13,243	10,455	7,621	7,921
note: for months with 31 days, the minimum flow calculation is slightly less than the 350cfs stipulated in the model constraints.													

Modsim Model Output of monthly average flows below Minidoka under Alternative A: No Action													
UNITS: cfs													
Water Year/Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1928	1,367	550	671	1,567	1,994	4,680	6,897	18,644	13,614	9,841	8,340	6,223	6,199
1929	3,527	2,231	2,032	3,070	2,918	2,390	5,257	11,161	9,438	9,630	8,203	6,142	5,500
1930	3,479	2,147	2,027	666	887	659	6,022	7,483	8,897	9,990	8,257	6,229	4,729
1931	3,250	504	488	488	540	488	4,913	8,247	8,687	8,143	5,931	2,418	3,675
1932	1,681	504	488	511	540	488	2,510	6,666	8,010	9,055	8,359	6,340	3,763
1933	3,492	2,183	2,163	488	540	488	2,835	7,030	8,564	9,255	8,289	6,311	4,303
1934	3,564	1,940	1,936	488	540	488	4,768	7,574	8,239	6,980	19,516	5,624	5,138
1935	1,887	636	2,159	1,741	1,927	1,061	2,798	7,176	8,555	9,572	8,383	6,512	4,367
1936	3,533	2,084	2,062	572	773	488	2,927	7,879	8,750	9,454	8,359	6,352	4,436
1937	3,584	2,054	2,016	488	541	488	4,996	7,994	8,116	7,151	6,108	3,698	3,936
1938	1,496	504	488	488	540	488	4,520	10,368	8,724	9,565	8,276	7,072	4,377
1939	3,838	2,083	2,025	2,768	3,154	2,657	8,673	11,638	9,064	8,798	7,296	4,529	5,543
1940	1,343	504	488	1,858	2,164	1,267	4,858	8,758	9,159	7,922	7,261	3,926	4,126
1941	1,452	504	535	488	620	488	4,910	8,233	8,111	8,751	7,502	5,089	3,890
1942	3,365	772	594	488	540	488	2,826	6,779	8,027	9,227	8,285	6,130	3,960
1943	3,395	504	724	3,593	4,146	3,899	16,374	8,546	11,814	10,914	9,357	7,304	6,714
1944	4,612	2,187	7,424	4,229	3,307	2,819	4,921	8,513	8,349	9,014	8,293	6,024	5,808
1945	3,153	504	520	488	540	488	2,792	7,058	8,731	9,324	8,356	6,798	4,063
1946	4,070	2,261	2,175	4,577	5,206	8,175	14,888	13,142	9,171	9,463	8,240	6,115	7,290
1947	3,378	504	488	3,296	3,710	6,673	6,843	11,843	8,832	9,465	8,185	6,209	5,785
1948	3,508	2,022	1,946	3,621	4,162	2,841	5,379	14,637	14,626	9,556	8,215	6,262	6,398
1949	3,605	2,051	2,014	1,096	1,155	674	6,746	16,976	14,248	9,891	8,247	6,255	6,080
1950	3,203	608	600	4,475	4,799	7,728	11,149	10,174	11,903	10,971	9,446	7,530	6,882
1951	4,401	3,948	8,001	8,929	8,444	9,620	12,061	10,642	9,678	9,718	8,135	7,055	8,386
1952	3,870	4,225	7,407	7,132	6,319	5,046	10,648	18,830	15,125	11,146	8,393	6,317	8,705
1953	3,327	2,079	2,044	2,471	2,684	1,486	3,852	10,916	10,758	9,573	8,241	7,186	5,385
1954	4,114	2,034	2,078	1,691	1,588	2,895	6,368	12,942	8,766	9,471	8,280	6,389	5,551
1955	3,541	1,823	1,946	1,090	1,139	488	3,589	7,395	8,728	9,315	8,096	6,139	4,441
1956	3,537	504	488	5,813	6,532	4,986	13,037	14,331	15,762	10,960	8,108	6,970	7,586
1957	3,950	2,054	2,073	5,323	6,003	4,253	6,898	13,804	13,900	9,655	8,261	6,991	6,930
1958	3,920	2,079	1,944	3,345	3,704	2,747	4,810	15,253	9,584	9,743	8,295	6,198	5,968
1959	3,344	504	488	488	540	590	2,702	7,667	9,143	9,632	8,198	6,251	4,129
1960	3,410	1,999	1,868	488	540	488	4,815	8,642	9,100	8,121	7,181	4,560	4,268
1961	1,651	504	488	488	540	488	4,953	8,225	8,798	7,489	5,906	3,082	3,551
1962	1,480	504	488	2,172	2,450	1,445	9,382	11,903	8,908	9,555	8,531	6,362	5,265
1963	3,396	1,918	1,989	1,136	1,108	601	2,523	10,487	12,310	9,373	8,237	6,405	4,957
1964	3,687	2,068	2,103	488	540	488	6,561	11,566	15,125	9,796	8,257	6,899	5,631
1965	3,812	2,146	2,521	7,477	8,219	6,919	12,661	10,339	13,785	10,927	9,151	7,350	7,942
1966	4,659	1,954	6,862	5,994	4,716	3,171	4,957	11,170	9,477	8,727	7,273	4,300	6,105
1967	1,363	504	488	4,681	5,008	3,345	5,947	10,365	13,676	9,422	8,231	7,398	5,869
1968	4,151	2,048	2,682	4,913	5,227	3,415	2,710	11,868	12,132	9,053	7,981	6,832	6,084

Modsim Model Output of monthly average flows below Minidoka under Alternative A: No Action													
1969	3,910	1,972	2,129	6,050	5,480	3,686	9,786	18,540	11,401	9,878	8,022	6,221	7,256
1970	3,246	504	558	3,187	3,102	4,198	4,918	13,150	15,839	10,586	8,035	6,939	6,188
1971	4,052	2,156	4,855	9,984	10,643	9,092	17,467	21,064	16,884	14,637	10,634	7,617	10,757
1972	5,814	8,616	7,227	12,490	11,670	10,057	12,331	15,738	22,314	13,427	9,264	7,318	11,355
1973	4,366	3,566	7,772	6,215	5,914	4,108	6,685	14,325	10,079	9,104	8,003	6,105	7,187
1974	3,537	737	607	9,553	10,522	8,103	11,487	15,974	22,770	13,225	9,391	7,344	9,437
1975	4,650	3,091	3,419	10,466	7,097	5,126	5,846	11,704	15,125	15,227	10,373	7,300	8,286
1976	4,914	6,618	8,554	8,479	8,858	10,846	10,701	18,270	16,357	11,848	8,024	6,775	10,020
1977	4,079	3,909	6,704	3,472	3,586	1,413	4,909	8,839	9,444	8,180	6,747	2,476	5,313
1978	1,529	504	488	1,163	2,895	2,056	4,951	12,208	9,639	11,082	9,638	7,456	5,301
1979	4,537	2,084	2,131	3,993	3,990	2,437	4,057	14,128	10,412	9,619	8,303	6,214	5,992
1980	3,171	504	488	2,136	2,041	2,176	6,947	16,029	14,065	10,474	8,812	6,376	6,102
1981	3,727	2,171	2,153	2,330	2,399	863	4,747	8,665	11,944	10,006	8,818	6,477	5,358
1982	3,006	517	547	4,977	5,686	4,943	14,763	14,764	12,883	14,524	9,733	7,700	7,837
1983	6,789	8,167	7,073	12,661	12,032	9,815	9,142	14,118	15,817	13,433	9,359	7,327	10,478
1984	8,464	10,283	9,758	11,424	12,427	10,396	11,030	17,649	22,756	14,171	8,634	10,750	12,312
1985	6,340	9,052	8,702	5,742	6,297	4,622	10,473	17,728	9,821	9,799	8,210	6,195	8,582
1986	3,288	504	488	9,901	11,553	9,662	20,167	21,414	17,149	13,388	9,523	7,320	10,363
1987	4,277	4,099	5,952	7,490	4,581	2,490	6,410	8,824	9,493	7,957	7,343	4,474	6,116
1988	1,395	504	488	488	540	779	4,758	8,268	8,808	8,048	7,446	4,700	3,852
1989	1,428	504	488	488	540	655	3,384	11,634	9,450	9,801	8,500	6,628	4,458
1990	3,399	2,174	2,089	488	540	655	5,103	8,267	8,355	8,685	8,586	6,068	4,534
1991	2,774	504	489	488	540	607	2,798	7,160	9,271	9,840	9,195	6,712	4,198
1992	2,701	2,094	1,999	488	540	488	4,975	7,825	7,740	7,676	5,440	2,299	3,689
1993	1,791	504	488	488	597	488	899	14,430	8,562	9,823	8,405	6,808	4,440
1994	3,539	2,110	1,958	922	1,241	646	5,310	7,913	9,422	9,454	7,673	5,716	4,659
1995	1,832	514	491	826	972	488	5,908	12,433	14,120	10,090	8,558	7,376	5,301
1996	3,993	2,339	6,929	8,899	10,700	7,965	15,648	15,281	13,088	11,544	9,581	7,571	9,461
1997	4,936	2,296	2,185	11,209	11,540	10,095	18,683	26,868	26,689	14,637	9,572	7,500	12,184
1998	9,958	7,822	6,964	12,677	7,590	5,788	10,347	14,822	16,315	12,528	8,934	7,122	10,072
1999	4,033	5,817	6,521	9,220	10,305	11,819	10,605	14,637	19,955	13,826	9,778	7,781	10,358
2000	4,946	2,128	2,035	4,058	5,095	4,743	7,674	8,777	10,240	9,837	8,498	6,268	6,191
AVERAGE	**3,587**	**2,207**	**2,668**	**3,947**	**4,001**	**3,482**	**7,263**	**11,977**	**11,816**	**10,136**	**8,472**	**6,284**	**6,320**
note: for months with 31 days, the minimum flow calculation is slightly less than the 500cfs stipulated in the model constraints.													

Modsim Model Output of monthly average flows below Minidoka under Alternatives B and C													
UNITS: cfs													
Water Year/Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	**Annual Average**
1928	1,367	840	671	2,252	2,658	6,244	6,985	18,644	13,618	9,842	8,340	6,223	**6,474**
1929	3,527	2,231	2,032	2,748	2,562	2,947	5,346	11,164	9,435	9,630	8,203	6,142	**5,497**
1930	3,479	2,147	2,027	607	726	779	6,111	7,483	8,892	9,989	8,257	6,229	**4,727**
1931	3,250	840	585	512	567	512	4,913	8,242	8,683	8,087	5,578	3,248	**3,752**
1932	1,703	840	512	585	626	585	2,510	6,675	8,020	9,060	8,364	6,340	**3,819**
1933	3,492	2,183	2,163	585	648	585	2,835	6,987	8,519	9,349	8,289	6,184	**4,318**
1934	3,564	1,938	1,936	512	567	512	4,768	7,574	8,239	6,577	20,028	4,666	**5,073**
1935	1,887	840	1,977	1,741	1,927	1,061	2,798	7,176	8,549	9,573	7,837	6,193	**4,297**
1936	3,530	2,084	2,062	585	746	585	2,927	7,879	8,745	9,478	8,359	6,352	**4,444**
1937	3,584	2,054	2,016	512	567	512	4,996	7,967	8,088	7,327	6,108	3,698	**3,952**
1938	1,496	840	512	585	648	585	4,303	10,393	8,786	9,558	8,276	7,072	**4,421**
1939	3,838	2,083	2,025	2,454	2,807	3,221	8,762	11,642	9,059	8,798	7,296	4,529	**5,543**
1940	1,343	840	512	1,420	1,620	1,706	4,858	8,758	9,155	7,922	7,261	4,319	**4,143**
1941	1,452	840	535	512	620	512	4,910	8,246	8,121	8,751	7,012	5,089	**3,883**
1942	3,365	840	594	585	648	585	2,826	6,779	8,027	9,232	8,285	6,130	**3,992**
1943	3,395	840	724	3,520	4,066	3,826	16,374	8,546	11,818	10,923	9,357	7,304	**6,724**
1944	4,612	2,083	6,199	4,229	3,193	3,697	4,921	8,513	8,349	9,014	8,293	5,945	**5,754**
1945	3,176	840	585	585	648	585	2,792	7,112	8,693	9,306	8,356	6,798	**4,123**
1946	4,070	2,261	2,175	4,093	4,670	8,570	14,976	13,144	9,171	9,463	8,240	6,115	**7,246**
1947	3,378	840	585	2,797	3,219	7,108	6,930	11,846	8,834	9,465	8,185	6,209	**5,783**
1948	3,508	2,022	1,946	3,299	3,674	3,397	5,468	14,637	14,634	9,557	8,215	6,262	**6,385**
1949	3,605	2,051	2,014	761	784	1,217	6,833	16,987	14,279	9,891	8,247	6,255	**6,077**
1950	3,203	840	600	4,078	4,360	8,210	11,237	10,174	11,906	10,971	9,446	7,530	**6,879**
1951	4,401	2,966	8,001	8,929	8,444	10,499	12,148	10,642	9,678	9,718	8,135	7,055	**8,385**
1952	3,870	3,241	7,407	7,132	6,101	5,516	11,156	18,832	15,125	11,462	8,393	6,317	**8,713**
1953	3,327	2,079	2,044	2,055	2,223	1,949	3,941	10,921	10,754	9,573	8,241	7,186	**5,358**
1954	4,114	2,034	2,078	1,371	1,233	3,453	6,455	12,946	8,766	9,471	8,280	6,389	**5,549**
1955	3,541	1,823	1,946	768	783	585	4,151	7,395	8,728	9,315	8,096	6,060	**4,433**
1956	3,537	840	585	5,377	5,841	5,429	13,125	14,331	15,762	10,960	8,108	6,970	**7,572**
1957	3,950	2,054	2,073	5,002	5,648	4,811	6,985	13,807	13,901	9,655	8,261	6,991	**6,928**
1958	3,920	2,079	1,944	3,023	3,348	3,304	4,899	15,254	9,669	9,743	8,259	5,642	**5,924**
1959	3,344	840	585	585	648	585	2,702	7,668	9,143	9,633	7,501	5,596	**4,069**
1960	3,410	1,999	1,868	512	548	512	4,815	8,642	9,100	8,121	6,352	4,405	**4,190**
1961	1,651	840	512	512	567	512	4,953	8,402	8,984	7,570	4,578	2,491	**3,465**
1962	1,480	840	512	1,949	2,203	1,222	10,913	12,022	8,712	9,556	8,531	6,362	**5,359**
1963	3,396	1,918	1,989	1,411	1,412	585	3,442	10,846	12,312	9,373	8,237	6,405	**5,110**
1964	3,687	2,068	2,103	585	626	585	6,258	11,568	15,125	9,796	8,257	6,899	**5,630**
1965	3,812	2,146	2,521	7,155	7,863	7,476	12,748	10,339	13,788	10,927	9,151	7,350	**7,940**
1966	4,659	1,954	5,896	5,994	4,716	4,049	5,046	11,174	9,472	8,727	7,273	4,300	**6,105**
1967	1,363	840	512	4,246	4,526	3,788	6,034	10,368	13,676	9,422	8,231	7,398	**5,867**
1968	4,151	2,048	2,078	4,792	4,918	4,173	2,710	11,955	12,133	9,053	7,981	6,832	**6,069**

Modsim Model Output of monthly average flows below Minidoka under Alternatives B and C													
1969	3,910	1,972	2,129	5,123	5,459	4,546	9,875	18,543	11,405	9,878	8,022	6,221	**7,257**
1970	3,246	840	585	2,747	2,616	4,637	5,005	13,224	15,942	10,586	8,035	6,939	**6,200**
1971	4,052	2,156	3,893	9,984	10,643	9,970	17,554	21,064	16,884	14,637	10,634	7,617	**10,758**
1972	4,849	8,616	7,227	12,490	11,267	10,935	12,418	15,738	22,318	13,427	9,264	7,318	**11,322**
1973	4,366	2,644	7,702	6,215	5,914	4,986	6,774	14,326	10,079	9,104	8,003	6,105	**7,185**
1974	3,537	840	607	9,198	10,130	8,627	11,574	15,974	22,821	13,225	9,391	7,344	**9,439**
1975	4,650	3,091	3,419	9,516	7,097	6,004	5,933	11,704	15,125	15,183	10,366	7,300	**8,283**
1976	4,395	6,165	8,554	8,479	8,553	11,724	10,788	18,271	16,361	11,848	8,024	6,775	**9,995**
1977	4,079	2,915	6,704	3,472	3,586	2,291	4,909	8,834	9,439	8,180	6,143	3,004	**5,296**
1978	1,533	840	512	776	2,467	1,667	5,197	12,203	9,639	11,082	9,638	7,456	**5,251**
1979	4,537	2,084	2,131	3,896	3,883	3,218	4,151	14,277	10,413	9,619	8,303	5,693	**6,017**
1980	3,171	840	585	1,839	1,653	2,757	7,034	16,032	14,071	10,475	8,812	6,376	**6,137**
1981	3,727	2,171	2,153	2,018	2,054	1,429	4,836	8,666	11,948	10,006	8,818	5,979	**5,317**
1982	3,006	840	585	4,695	5,373	5,544	14,854	14,765	12,949	14,521	9,733	7,700	**7,880**
1983	5,824	8,167	7,073	12,661	12,032	10,693	9,229	14,118	15,821	13,434	9,359	7,327	**10,478**
1984	7,499	10,283	9,758	11,424	11,999	11,274	11,117	17,649	22,756	14,171	8,634	10,750	**12,276**
1985	5,375	9,052	8,702	5,742	6,297	5,500	10,563	17,731	9,906	9,799	8,210	6,195	**8,589**
1986	3,288	840	585	9,413	11,013	10,053	25,731	17,593	15,656	13,388	9,523	7,320	**10,367**
1987	4,277	3,105	5,952	7,490	4,581	3,368	6,499	8,819	9,488	7,957	7,343	4,526	**6,117**
1988	1,395	840	512	512	548	779	4,758	8,213	8,751	8,048	7,446	4,700	**3,875**
1989	1,428	840	512	585	648	655	2,833	11,636	9,167	9,941	8,500	6,628	**4,448**
1990	3,399	2,174	2,089	512	567	655	5,052	8,263	8,351	8,685	8,395	5,826	**4,497**
1991	2,774	840	585	585	648	585	2,798	7,339	9,452	9,934	9,195	6,712	**4,287**
1992	2,701	2,094	1,999	512	548	512	4,975	7,840	7,755	7,159	6,431	2,256	**3,732**
1993	1,794	840	512	585	648	585	899	13,014	8,608	9,846	8,405	6,808	**4,379**
1994	3,539	2,110	1,958	536	896	646	5,981	7,909	9,415	9,454	7,425	5,681	**4,629**
1995	1,832	840	512	714	848	585	6,445	12,436	14,121	10,091	8,558	7,376	**5,363**
1996	3,993	2,339	6,028	8,899	10,331	8,843	15,735	15,281	13,091	11,544	9,581	7,571	**9,436**
1997	4,936	2,296	2,185	10,314	11,540	10,974	18,805	27,000	26,689	14,637	9,572	7,500	**12,204**
1998	8,992	7,822	6,964	12,677	7,590	6,667	10,434	14,825	16,320	12,528	8,934	7,122	**10,073**
1999	4,033	4,836	6,521	9,220	10,305	12,697	10,692	14,637	19,955	13,826	9,778	7,781	**10,357**
2000	4,946	2,128	2,035	3,737	4,234	5,621	7,761	8,777	10,235	9,837	8,498	6,299	**6,176**
AVERAGE	**3,514**	**2,237**	**2,615**	**3,802**	**3,838**	**3,912**	**7,439**	**11,923**	**11,800**	**10,135**	**8,420**	**6,242**	**6,323**
note: for months with 31 days, the minimum flow calculation is slightly less than the 600cfs stipulated in the model constraints.													

Modsim Model Output of monthly average flows below American Falls Dam under Alternative A: No Action													
UNITS: cfs													
Water Year/Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	**Annual Average**
1928	1,863	353	342	1,582	2,051	5,659	7,715	19,987	15,284	12,306	10,394	7,573	7,092
1929	2,788	2,017	1,952	2,476	2,803	2,953	5,528	12,494	11,447	12,342	10,286	7,209	6,191
1930	2,988	2,017	1,952	400	539	1,357	6,732	8,919	11,036	12,555	10,421	7,685	5,550
1931	2,583	553	506	475	451	1,445	6,556	10,332	11,159	10,546	7,397	2,284	4,524
1932	1,968	422	344	390	493	1,253	3,402	8,241	10,093	11,740	10,699	7,771	4,735
1933	2,869	2,017	1,952	482	543	1,269	3,579	8,270	10,550	11,926	10,755	7,666	5,157
1934	3,040	2,017	1,952	491	449	1,365	6,411	9,808	10,160	7,492	22,770	5,655	5,968
1935	2,157	591	1,997	1,590	1,709	1,922	3,443	8,646	10,787	12,286	9,082	8,991	5,267
1936	2,998	2,017	1,952	390	432	1,205	3,782	9,476	10,950	12,090	10,408	7,547	5,271
1937	2,948	2,017	1,952	601	378	1,297	6,364	9,952	10,456	9,531	8,155	3,698	4,779
1938	1,836	481	438	445	473	1,301	5,494	11,851	10,679	11,954	10,374	8,424	5,312
1939	3,365	2,017	1,952	2,655	3,038	3,359	9,339	12,983	11,320	11,094	9,322	4,517	6,247
1940	1,596	467	444	1,751	2,004	2,095	6,309	10,885	11,576	10,206	9,151	3,741	5,019
1941	1,501	355	342	378	378	1,361	6,403	10,491	10,222	11,371	9,651	6,101	4,879
1942	2,703	353	342	691	550	1,437	3,765	8,256	10,109	11,987	10,529	7,438	4,847
1943	3,046	378	342	3,300	3,886	4,538	16,987	9,873	13,692	13,366	11,347	8,573	7,444
1944	4,025	2,120	7,417	4,100	3,191	3,724	6,381	10,657	9,999	11,512	10,409	7,459	6,750
1945	2,688	393	342	528	465	1,357	3,250	8,458	10,741	11,759	10,453	7,970	4,867
1946	3,534	2,017	1,952	4,458	5,036	8,815	15,374	14,395	11,170	12,052	10,269	7,266	8,028
1947	2,761	390	450	3,155	3,517	7,405	7,712	13,310	10,744	12,056	10,328	7,587	6,618
1948	3,167	2,017	1,952	3,441	3,887	3,692	6,023	16,132	16,538	12,194	10,283	7,472	7,233
1949	3,112	2,017	1,952	884	993	1,289	7,282	18,020	16,239	12,650	10,427	7,640	6,875
1950	2,728	353	342	4,202	4,584	8,468	11,618	11,357	13,810	13,366	11,294	8,608	7,561
1951	3,908	3,819	7,919	9,029	7,906	10,509	12,690	11,992	11,506	12,134	10,124	8,450	9,166
1952	3,504	4,242	7,386	7,160	6,353	6,035	11,561	20,264	17,143	13,521	10,522	7,622	9,609
1953	2,872	2,017	1,952	2,316	2,595	2,260	4,344	11,886	12,579	12,049	10,357	8,515	6,145
1954	3,696	2,017	1,952	1,495	1,591	3,948	7,158	14,497	10,709	12,056	10,415	7,663	6,433
1955	2,942	2,017	1,952	1,061	1,115	1,461	4,425	8,850	10,796	11,925	10,260	7,444	5,354
1956	3,099	526	377	5,813	6,459	5,731	13,949	16,104	17,664	13,577	10,241	8,351	8,491
1957	3,433	2,017	1,952	5,246	5,730	5,060	7,703	15,320	15,922	12,315	10,490	8,336	7,794
1958	3,395	2,017	1,952	3,316	3,599	3,639	5,443	16,760	11,578	12,307	10,432	7,371	6,817
1959	2,766	511	612	463	564	1,568	3,448	9,203	11,183	12,252	10,504	7,390	5,039
1960	2,971	2,017	1,952	540	565	1,407	6,266	10,749	11,517	10,356	9,215	4,527	5,173
1961	1,957	588	485	406	482	1,388	6,495	10,221	11,176	10,003	7,754	2,835	4,483
1962	1,664	499	455	2,074	2,328	2,410	10,428	13,244	11,182	12,395	10,556	7,695	6,244
1963	3,007	2,017	1,952	1,073	1,024	1,577	3,353	11,852	14,288	12,151	10,398	7,602	5,858
1964	3,217	2,017	1,952	427	439	1,176	7,478	13,253	17,200	12,582	10,660	8,494	6,574
1965	3,342	2,017	1,952	7,471	8,330	7,696	13,627	11,765	15,820	13,365	10,873	8,792	8,754
1966	4,346	2,017	6,837	5,861	4,654	3,978	5,751	12,449	11,788	10,971	9,375	4,640	6,889
1967	1,768	439	401	4,573	4,938	4,269	6,778	11,962	15,956	12,295	10,689	8,625	6,891
1968	3,481	2,017	2,555	4,738	5,085	4,322	3,411	13,257	14,740	11,836	9,842	8,242	6,961

Modsim Model Output of monthly average flows below American Falls Dam under Alternative A: No Action													
1969	3,536	2,017	1,952	5,782	5,200	4,494	10,579	20,176	14,067	12,670	10,253	7,402	8,177
1970	2,665	437	342	2,679	2,756	4,997	5,320	14,274	18,472	13,125	10,182	8,065	6,943
1971	3,524	2,017	4,466	9,459	10,571	9,839	18,285	22,335	19,222	17,063	12,565	8,778	11,510
1972	5,255	8,684	6,899	12,172	11,466	10,262	12,209	16,378	23,860	15,289	10,917	8,261	11,804
1973	3,304	2,938	7,211	5,503	5,046	4,157	6,593	15,121	12,147	11,503	10,034	7,042	7,550
1974	2,583	353	342	8,913	9,819	8,705	11,726	17,167	25,022	15,543	11,162	8,723	10,005
1975	4,155	3,025	2,927	9,706	6,777	5,710	6,036	11,862	16,158	17,188	12,307	8,757	8,717
1976	4,680	6,614	8,347	8,268	8,688	11,556	10,987	19,530	18,229	14,292	10,027	8,017	10,770
1977	3,503	3,880	6,479	3,393	3,481	2,322	6,240	10,385	11,618	10,471	8,255	2,392	6,035
1978	1,764	488	442	1,040	2,788	3,050	5,904	12,896	11,483	13,306	11,625	9,053	6,153
1979	4,159	2,017	1,952	3,691	3,893	3,206	4,630	15,338	12,734	12,504	10,500	7,363	6,832
1980	2,578	419	374	1,721	1,704	3,013	7,563	15,706	15,153	12,066	10,697	7,827	6,568
1981	3,369	2,017	1,952	2,098	2,238	1,753	5,066	9,145	12,923	11,844	10,723	7,553	5,890
1982	2,424	353	342	4,841	5,526	5,768	14,370	15,160	15,130	16,559	11,346	8,564	8,365
1983	6,203	8,040	7,081	12,547	11,786	10,623	9,707	15,107	17,444	14,690	10,684	8,198	11,009
1984	7,077	9,127	8,915	10,842	12,017	10,874	10,727	17,455	23,851	16,865	10,616	12,052	12,535
1985	6,039	9,499	8,418	6,172	6,607	5,722	11,742	19,624	12,892	12,708	10,569	7,600	9,799
1986	2,706	410	760	10,021	11,257	10,238	19,989	22,117	19,247	15,743	11,592	8,596	11,056
1987	4,212	4,714	6,731	7,708	4,417	3,398	8,370	11,623	12,910	10,910	9,955	4,759	7,476
1988	1,563	468	450	448	487	1,625	6,461	10,725	11,663	10,753	9,894	4,891	4,952
1989	1,690	475	479	468	440	1,342	4,599	13,936	12,343	12,361	10,209	7,599	5,495
1990	2,754	2,017	1,952	408	524	1,528	6,617	10,364	11,058	11,485	10,240	6,866	5,484
1991	2,088	400	342	454	448	1,379	3,863	8,640	12,762	13,253	12,004	8,125	5,313
1992	2,264	2,017	1,952	441	483	1,447	7,203	10,721	9,913	9,500	6,334	2,168	4,537
1993	2,245	483	455	393	432	1,089	1,125	16,420	11,271	12,384	10,330	8,664	5,441
1994	3,061	2,017	1,952	834	899	1,548	6,615	9,735	11,821	11,407	9,737	6,149	5,481
1995	1,931	353	342	635	829	1,358	6,607	13,414	15,770	11,484	10,069	9,067	5,988
1996	3,325	2,017	6,840	8,686	10,681	9,000	16,464	16,786	16,175	14,096	11,772	9,060	10,408
1997	4,543	2,017	1,952	10,951	11,455	10,890	19,243	28,611	29,792	16,694	11,208	8,260	12,968
1998	8,970	7,673	6,709	12,483	7,483	6,744	11,129	16,289	18,520	14,842	11,066	8,386	10,858
1999	3,225	5,656	6,119	8,825	9,865	12,583	10,867	16,146	23,641	16,361	11,703	9,130	11,177
2000	4,306	2,017	1,952	3,907	4,855	5,612	8,501	10,508	12,831	12,412	10,323	7,206	7,036
AVERAGE	**3,196**	**2,121**	**2,537**	**3,800**	**3,843**	**4,285**	**8,070**	**13,426**	**13,995**	**12,573**	**10,490**	**7,343**	**7,140**
note: for months with 31 days, the minimum flow calculation is slightly less than the 350cfs stipulated in the model constraints.													

Modsim Model Output of monthly average flows below American Falls Dam under Alternatives B and C													
UNITS: cfs													
Water Year/Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	**Annual Average**
1928	1,702	643	342	2,268	2,713	6,344	7,715	19,987	15,288	12,307	10,394	7,573	7,273
1929	3,753	2,017	1,952	2,154	2,447	2,630	5,530	12,497	11,444	12,342	10,286	7,209	6,188
1930	3,954	2,017	1,952	342	378	599	6,734	8,919	11,031	12,555	9,453	7,676	5,467
1931	3,543	889	603	500	478	1,469	6,556	10,327	11,154	9,575	7,127	3,501	4,644
1932	1,990	758	369	465	581	1,350	3,402	8,250	10,103	11,745	9,729	7,759	4,708
1933	3,827	2,017	1,952	580	651	1,367	3,579	8,227	10,505	12,021	9,786	7,539	5,171
1934	4,004	2,017	1,952	515	476	1,389	6,411	9,808	10,160	7,156	22,314	5,692	5,991
1935	2,159	796	1,815	1,590	1,709	1,922	3,443	8,646	10,782	12,287	8,974	7,233	5,113
1936	3,958	2,017	1,952	404	417	1,303	3,782	9,476	10,945	12,115	9,440	7,539	5,279
1937	3,907	2,017	1,952	626	404	1,321	6,364	9,925	10,430	9,707	7,187	4,689	4,877
1938	1,836	817	463	542	581	1,398	5,277	11,875	10,741	11,947	10,374	8,424	5,356
1939	4,330	2,017	1,952	2,342	2,690	3,046	9,341	12,987	11,315	11,094	9,322	5,516	6,329
1940	1,601	804	468	1,312	1,466	1,656	6,222	10,885	11,571	10,206	8,183	5,122	4,958
1941	1,500	690	342	403	378	1,385	6,403	10,498	10,230	11,369	8,193	6,093	4,790
1942	3,663	421	342	788	658	1,535	3,765	8,256	10,109	11,992	9,561	7,430	4,877
1943	4,006	714	342	3,228	3,806	4,465	16,987	9,873	13,696	13,375	11,347	8,573	7,534
1944	4,990	2,017	6,192	4,100	3,081	3,724	6,294	10,657	9,999	11,512	9,441	7,372	6,615
1945	3,672	729	407	625	573	1,454	3,250	8,513	10,703	11,741	10,453	7,970	5,008
1946	4,499	2,017	1,952	3,974	4,500	8,332	15,374	14,398	11,170	12,052	10,269	7,266	7,983
1947	3,726	727	548	2,656	3,027	6,962	7,712	13,313	10,746	12,056	10,328	7,587	6,616
1948	4,132	2,017	1,952	3,119	3,409	3,370	6,025	16,132	16,546	12,196	10,283	7,472	7,221
1949	4,077	2,017	1,952	549	622	954	7,282	18,030	16,270	12,651	10,427	7,640	6,872
1950	3,693	585	342	3,806	4,145	8,072	11,618	11,357	13,814	13,366	11,294	8,608	7,558
1951	4,873	2,837	7,919	9,029	7,906	10,509	12,690	11,992	11,507	12,134	10,124	8,450	9,164
1952	4,469	3,258	7,386	7,160	6,134	5,627	11,982	20,267	17,143	13,836	10,522	7,622	9,617
1953	3,837	2,017	1,952	1,900	2,134	1,844	4,346	11,891	12,575	12,049	10,357	8,515	6,118
1954	4,662	2,017	1,952	1,175	1,237	3,628	7,158	14,501	10,709	12,056	10,415	7,663	6,431
1955	3,908	2,017	1,952	739	759	681	4,900	8,850	10,796	11,925	10,260	7,365	5,346
1956	4,064	863	474	5,377	5,771	5,295	13,949	16,104	17,664	13,577	10,241	8,351	8,478
1957	4,398	2,017	1,952	4,925	5,375	4,739	7,703	15,322	15,923	12,315	10,490	8,336	7,791
1958	4,360	2,017	1,952	2,995	3,242	3,318	5,445	16,760	11,663	12,307	10,396	5,817	6,689
1959	3,726	847	710	560	672	1,564	3,448	9,204	11,183	12,253	9,807	6,735	5,059
1960	3,936	2,017	1,952	564	572	553	6,179	10,750	11,518	10,356	7,409	5,349	5,096
1961	1,951	923	510	430	509	1,412	6,495	10,405	11,385	10,111	5,471	3,238	4,403
1962	1,664	835	479	1,851	2,081	2,187	11,958	13,362	10,985	12,395	10,556	7,695	6,337
1963	3,973	2,017	1,952	1,348	1,328	683	4,185	12,211	14,290	12,151	10,398	7,602	6,011
1964	4,182	2,017	1,952	525	528	395	7,088	13,255	17,200	12,583	10,660	8,494	6,573
1965	4,307	2,017	1,952	7,149	7,974	7,374	13,627	11,765	15,824	13,365	10,873	8,792	8,751
1966	5,311	2,017	5,872	5,861	4,654	3,978	5,753	12,453	11,784	10,971	9,375	5,639	6,972
1967	1,773	775	425	4,138	4,456	3,834	6,778	11,965	15,956	12,295	10,689	8,625	6,809
1968	4,447	2,017	1,952	4,618	4,781	4,202	3,324	13,344	14,740	11,836	9,842	8,242	6,945

Modsim Model Output of monthly average flows below American Falls Dam under Alternatives B and C													
1969	4,501	2,017	1,952	4,855	5,180	4,475	10,581	20,179	14,071	12,671	10,253	7,402	8,178
1970	3,630	773	369	2,240	2,270	4,558	5,320	14,348	18,574	13,125	10,182	8,065	6,955
1971	4,489	2,017	3,505	9,459	10,571	9,839	18,285	22,335	19,222	17,063	12,565	8,778	11,511
1972	5,255	8,684	6,899	12,172	11,071	10,262	12,209	16,378	23,864	15,289	10,917	8,261	11,772
1973	4,269	2,017	7,141	5,503	5,046	4,157	6,595	15,122	12,148	11,503	10,034	7,042	7,548
1974	3,548	457	342	8,559	9,427	8,351	11,726	17,167	25,073	15,543	11,162	8,723	10,006
1975	5,120	3,025	2,927	8,756	6,777	5,710	6,036	11,862	16,158	17,144	12,300	8,757	8,714
1976	5,126	6,161	8,347	8,268	8,388	11,556	10,987	19,530	18,232	14,292	10,027	8,017	10,744
1977	4,468	2,886	6,479	3,393	3,481	2,322	6,153	10,380	11,613	10,471	6,683	3,817	6,012
1978	1,767	824	466	654	2,360	2,661	6,150	12,891	11,483	13,306	11,625	9,053	6,103
1979	5,124	2,017	1,952	3,594	3,786	3,109	4,636	15,487	12,736	12,504	10,500	6,842	6,857
1980	3,543	755	472	1,424	1,328	2,716	7,563	15,709	15,159	12,066	10,697	7,827	6,605
1981	4,334	2,017	1,952	1,787	1,893	1,441	5,068	9,146	12,927	11,844	10,723	7,055	5,849
1982	3,389	676	380	4,559	5,213	5,491	14,373	15,160	15,196	16,555	11,346	8,564	8,408
1983	6,203	8,040	7,081	12,547	11,786	10,623	9,707	15,107	17,447	14,691	10,684	8,198	11,009
1984	7,077	9,127	8,915	10,842	11,603	10,874	10,727	17,455	23,851	16,865	10,616	12,052	12,500
1985	6,039	9,499	8,418	6,172	6,607	5,722	11,744	19,628	12,977	12,708	10,569	7,600	9,807
1986	3,671	746	857	9,533	10,718	9,751	25,467	18,296	17,754	15,743	11,592	8,596	11,060
1987	5,177	3,720	6,731	7,708	4,417	3,398	8,372	11,618	12,906	10,910	8,987	5,801	7,479
1988	1,563	804	475	472	497	1,625	6,461	10,669	11,606	10,753	8,926	5,881	4,978
1989	1,690	811	503	566	548	1,342	4,048	13,939	12,061	12,500	10,209	7,599	5,485
1990	3,719	2,017	1,952	432	551	650	6,479	10,360	11,054	11,485	9,178	6,515	5,366
1991	3,048	737	438	552	556	1,358	3,863	8,820	12,943	13,346	11,036	8,116	5,401
1992	3,223	2,017	1,952	465	492	1,471	7,203	10,736	9,929	9,124	6,258	3,061	4,661
1993	2,247	819	480	491	483	1,187	1,125	15,004	11,317	12,407	10,330	8,664	5,380
1994	4,026	2,017	1,952	448	554	670	7,200	9,730	11,814	11,407	8,521	7,099	5,453
1995	1,931	679	362	523	705	1,456	7,143	13,417	15,771	11,485	10,069	9,067	6,051
1996	4,290	2,017	5,939	8,686	10,313	9,000	16,464	16,786	16,178	14,096	11,772	9,060	10,383
1997	5,508	2,017	1,952	10,056	11,455	10,890	19,278	28,743	29,792	16,694	11,208	8,260	12,988
1998	8,970	7,673	6,709	12,483	7,483	6,744	11,129	16,292	18,524	14,842	11,066	8,386	10,859
1999	4,190	4,675	6,119	8,825	9,865	12,583	10,867	16,146	23,641	16,361	11,703	9,130	11,175
2000	5,271	2,017	1,952	3,586	4,002	5,612	8,501	10,508	12,826	12,412	10,323	6,238	6,937
AVERAGE	**3,901**	**2,151**	**2,484**	**3,655**	**3,681**	**4,102**	**8,185**	**13,372**	**13,979**	**12,563**	**10,193**	**7,418**	**7,141**
note: for months with 31 days, the minimum flow calculation is slightly less than the 350cfs stipulated in the model constraints.													

Appendix E Fish and Wildlife Coordination Act Consultation

Reclamation's Responses to Recommendations

Final Fish and Wildlife Coordination Act Report February 2010

Reclamation's Responses to Recommendations in the Fish and Wildlife Coordination Act for the Minidoka Dam Spillway Replacement

CAR 01:

The Service recommends mapping and quantifying the extent of waterfowl fall and spring use areas that could be affected, and conducting an analysis of the magnitude of impacts from proposed changes in drawdown period on migrating or overwintering waterfowl. Analysis could include (but not limited to) available annual fall and spring waterfowl survey data on the Refuge.

Comment noted. Reclamation has prepared a more in depth analysis of waterfowl and other migratory water birds in the FEIS under Section 3.7.2, avian communities.

CAR 02:

As mitigation to prevent no net loss of in-kind wildlife value (based on the above identified waterfowl mapping efforts and other new or existing wildlife-based inventory/monitoring effort) in the riparian habitats around Lake Walcott, we also recommend the following: Reclamation should actively seek to obtain and implement the authority and flexibility to adapt reservoir levels to achieve storage commitments and provide power while *maximizing* benefits that will preserve the integrity of the Refuge as an Important Bird Area, support migrating and nesting waterfowl populations, and that will still result in habitat improvement for desirable fish species (e.g. smallmouth bass) in the reservoir.

Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the EIS under the specific sections addressing the various natural resources.

CAR 03:

As mitigation to prevent no net loss of in-kind riparian tree, shrub, and emergent habitat value, we recommend implementation monitoring of changes in beaver and muskrat populations, and of impacts to cottonwood trees and cattail stands.

Reclamation intends to monitor the response of muskrats and beavers using the FWS refuge's data sources. Cottonwood trees may need to be protected with fencing. Willow and cattail species should not be significantly affected by a slight increase in muskrat and beaver populations. (Bouffard 2009).

CAR 04:

We recommend design and implementation of adaptive management strategies to prevent a net loss of in-kind habitat value for species that use cottonwood trees, willow, and cattail beds.

Reclamation will adopt an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the EIS under the specific sections addressing the various natural resources.

CAR 05:

Monitoring protocols will need to be devised to detect early presence of Eurasian milfoil, should it become established. Management strategies to prevent a net loss of in-kind habitat value in shallow riparian areas, including adapting the timing and duration of reservoir drawdown periods to freeze out milfoil can then be developed. Monitoring would need to be continued post-treatment to determine if control measures are successful.

Reclamation currently coordinates with a number of other Federal, State and local governments to manage invasive species, including aquatics on lands and waters within

its jurisdiction. Reclamation will utilize, and modify if needed, its current invasive species management program to monitor for increased invasive species establishment as may be influenced by this project. With the revised operations as described in Section 2.3.8 Operations, Reclamation has retained the flexibility, if needed, to adjust operations to help control, or deter establishment of, invasive species.

CAR 06:

We recommend that Reclamation consult with the Refuge and/or IDFG to adopt or develop monitoring protocols to determine if leopard frogs will be affected by the new drawdown periods. If impacts of concern are found, we recommend adoption of a management strategy to avoid a no net loss of in-kind habitat value for leopard frogs.

Reclamation has included for each action alternative an adaptive management approach to reservoir operations regarding leopard frogs, within Reclamations operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.

CAR 07:

We recommend that Reclamation continue to monitor the abundance and distribution 9and reproduction) of listed snails in the pools below the spillway; and, working with IDFG, determine baseline abundance and distribution of rainbow trout below the spillway during the irrigation season, and especially during the hottest part of the summer. Reclamation agreed in Appendix E of the DEIS to determine baseline conditions below the spillway for water temperature; pH; total maximum daily load; dissolved solids; dissolved oxygen; sediment deposition and distribution; abundance, diversity, and distribution of aquatic macrophytes; and other parameters critical to wetland function. Monitoring for these parameters should be continued under the proposed spillway operations. To the above parameters, we recommend that minimum and maximum values be monitored for water temperature, pH total maximum daily load, and dissolved oxygen.

Reclamation currently monitors ESA listed snails in the project area and will continue to do so. Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamations operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.

CAR 08:

If listed snails and/or trout are impacted, we recommend the following to avoid or minimize net loss of in-kind habitat value to these species: Reclamation should actively seek to obtain and implement the authority and flexibility to adapt minimum summer spillway flows that will provide power while *maximizing* benefits that will preserve the integrity of the wetlands and pools below the spillway.

Reclamation has altered the proposed action to reflect this comment. In Chapter 2 Alternatives, the revised operations description can be found under Section 2.3.8 Operations. To summarize, Reclamation will establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. Rather than immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and assistance from the Technical Team, Reclamation will adjust operations accordingly to avoid impacts, or provide mitigation if required.

CAR 09:

We further recommend that this flexibility include increasing minimum summer spillway flows to a level above 500 cfs if monitoring indicates 500cfs is impacting either or both rainbow trout and listed snails. This condition should include the following: If snail and/or trout presence, abundance, and distribution (including snail reproduction) are being impacted, but monitoring cannot definitively indicate that flows of 500 cfs are the cause, Reclamation should still commit to raising minimum flows and monitor effects on snails and trout. If parameters for these species improve, Reclamation should keep the flows at the higher level, even if this means doing so on a permanent basis. If parameters for these species do not improve, flows could be decreased back to 500 cfs.

As discussed above, Reclamation has altered the proposed action to reflect this comment. In Chapter 2 Alternatives, the revised operations description can be found under Section 2.3.8 Operations. To summarize, Reclamation will establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. Rather than immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and assistance from the Technical Team, Reclamation will adjust operations accordingly to avoid impacts, or provide mitigation if required.

CAR 10:

If Reclamation is unable to secure and implement the authority and flexibility to adapt minimum summer spillway flows to avoid or minimize impacts to the spillway trout fishery, we recommend that Reclamation commit to mitigating loss of the spillway trout fishery in consultation with IDFG by some means acceptable to them.

A monitoring program will be established along with the creation of a Technical Team to address this concern as well as spillway and reservoir impacts to other fish and wildlife species.

CAR 11:

The Service recognizes that designing and installing fish barriers as part of replacing headworks for the canals would significantly increase the cost of the project. Additionally, once installed, fish barriers usually entail annual maintenance costs. However, the FWCA states that fish and wildlife conservation measures that are adopted should be considered and integral part of project costs, including measures that modify a project and/or project operations. It would be appropriate to request an additional appropriation of funds to cover adoption and installation of fish barriers as a conservation measure.

Reclamation will not consider this recommendation because the existing fishery is a put and take fishery, the cost is prohibitive, and the IDFG Director has not issued a need determination.

CAR 12:

We recommend that Reclamation include the following in the EIS to ensure a full and adequate evaluation occurs for anticipated impacts:

- **The new headworks will likely remain functional for at least as long as the existing headworks, i.e., at least a century, so an opportunity to include fish barriers as part of new headworks will not occur again for a very long time.**
- **Once the new headworks are installed, retro-fitting them post-construction with fish barriers would likely incur higher costs than if barriers are installed as part of the proposed project. This higher cost would likely decrease the probability of installing fish barriers in the future, and the current unmitigated loss of fish resources would continue.**
- **Without an alternative analysis, including analyses of types of barriers suitable to these conditions and their costs, a viable plan for soliciting funding to include barriers as part of the current project cannot be formed. Funding sources could include the state of Idaho, irrigation districts, congress, NGOs, and other partners.**
- **The canals will be operated in violation of the Idaho Code as long as the canals remain without fish barriers, and unmitigated loss of fish resources would continue, counter to the intent of the FWCA and the CRBFWP.**

The entrainment that occurs at the headworks has occurred since Minidoka Dam was completed in 1906 and is considered part of the existing environment for this project. In accordance with Idaho Code Section 36-906, screening is not required until the IDFG Director determines a need and issues a written order for them to be constructed. Alternative B will be revised to acknowledge this issue in Section 3.6 Aquatic Biota, Affected Environment, Alternative B, Reservoir Fish Community, Fish Populations.

CAR 13:

Based on the above discussion, the Service strongly recommends that Reclamation include a third action alternative in the EIS, such that fish barriers are designed into the proposed headworks for the North Side and South Side canals.

This alternative will not be considered because it will increase the cost of the project significantly and there has been no determination of need issued by the IDFG Director.

CAR 14:
In addition, we recommend that the No Action Alternative include a more in depth analysis than contained in the project Draft Environmental Impact Statement of the impacts to fish and other species, IDFG's long term costs, and recreational opportunities foregone, without fish barriers in place.

Reclamation believes this has been addressed appropriately.

CAR 15:
The Service recommends, however, that Reclamation be more specific in describing and committing to adaptive management strategies.

Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be addressed in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the EIS under the specific sections addressing the various natural resources.

CAR 16:
We also recommend that specific management strategies be attached to monitoring in order to minimize or mitigate impacts, i.e., if condition "X" exists, then management action "Y" will take place to minimize or mitigate identified impacts.

As indicated above, Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be addressed in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the EIS under the specific sections addressing the various natural resources.

CAR 17:
The Service recommends that if adaptive management is included as a management tool, then a Technical Team should be developed to carry through with adaptive management decisions.

Reclamation will establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. Rather than immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and in consultation with the Technical Team, Reclamation will, as practicable, adjust operations to avoid impacts, or provide mitigation.

CAR 18:
Willing cooperation may be more easily secured from all parties if Reclamation would commit to be bound by consensus agreement reach by the team, provide such agreement would not violate or be inconsistent with existing legal authorities or commitments under which Reclamation operates.

Reclamation will make every effort to incorporate the Technical Team's recommendations regarding monitoring and subsequent management strategies within our legal authorities, contractual obligations and funding limitations.

United States Department of the Interior

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FEB 05 2010

Memorandum

To: U.S. Bureau of Reclamation, Snake River Area Office, Boise, Idaho (Attn: Mr. Jerrold D. Gregg, Area Manager)

From: State Supervisor, Idaho Fish and Wildlife Office, Fish and Wildlife Service, Boise, Idaho

Russell R. Holder for Jeff Foss

Subject: Minidoka Spillway Replacement Project, Final Fish and Wildlife Coordination Act Report—Minidoka, Blaine, Cassia Counties, Idaho 1009.2005 14420-2010-CPA-0003

Attached with this memorandum is the Fish and Wildlife Service's (Service) Final Fish and Wildlife Coordination Act Report (CAR) on the potential impacts of implementing the Bureau of Reclamation's (Reclamation) Minidoka Spillway Replacement project, which includes replacement of the spillway, North Side Canal and South Side Canal headworks, and proposed operational changes for the spillway and Minidoka Dam reservoir. We used a combination of information from the Idaho Department of Fish and Game (IDFG), from staff from the Southeast Idaho National Wildlife Refuge Complex, and information provided by Reclamation, in addition to site visits and analysis conducted by the Service, to complete this CAR.

Dwayne Winslow of my staff would be happy to discuss its content at your convenience and is available to answer any questions you may have about its recommendations. The IDFG has reviewed this report in its draft form and is in substantial agreement with the analysis and recommendations contained herein. Please contact Mr. Winslow at (208) 378-5249 or Mark Robertson at (208) 378-5287 if the need arises.

Attachment

cc: IDFG, Jerome (McDonald)
FWS-SEID, Chubbuck (Casselman)
FWS-MNWR, Rupert (Krueger)
BOR-SRA, Boise (Meuleman)

TAKE PRIDE IN AMERICA

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

FINAL FISH AND WILDLIFE COORDINATION ACT REPORT

For the

MINIDOKA DAM SPILLWAY REPLACEMENT, MINIDOKA PROJECT, IDAHO

February 2010

Prepared for U.S. Bureau of Reclamation

Prepared By:

U.S. Fish and Wildlife Service
Idaho Fish and Wildlife Office
1387 South Vinnell Way, Room 368
Boise, Idaho 83709
Jeff Foss, State Supervisor

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INTRODUCTION

Fish and Wildlife Service (Service) coordination with the Bureau of Reclamation (Reclamation) for the Minidoka Dam Spillway Replacement Project began in May of 2009 with the signing of an Interagency Acquisition. This agreement outlined tentative dates and products that would be required, and for which the Service's involvement would be needed, for Reclamation to proceed through the public process of authorizing their proposed spillway replacement actions, inclusive of the Fish and Wildlife Coordination Act (FWCA, as amended), the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA, as amended). The Service provided an earlier set of project recommendations and potential mitigation efforts in a Draft Planning Aid Memorandum on October 14, 2009. This Final Fish and Wildlife Coordination Act Report evaluates the effects of proposed alternatives for replacement of the Minidoka Dam spillway on fish and wildlife resources, and provides recommendations to alleviate those effects under the authority of the FWCA.

The location descriptions, project description, and information on fish and wildlife resources present in or near the project area in this report are summarized from Reclamations's draft Environmental Impact Statement (DEIS). Complete location and project descriptions and detailed information on fish and wildlife resources are contained in the DEIS.

Reclamation is proposing to correct structural problems at the Minidoka Dam spillway and associated facilities on Lake Walcott, Idaho. The current structure, consisting of stoplogs and piers, is showing considerable signs of degradation.

The purpose of the proposed action is to prevent structural failure of the Minidoka Dam spillway and associated structures. After 103 years of continued use, the 2,385-foot-long concrete spillway has reached the end of its functional lifespan. The concrete that forms the spillway crest and stoplog structure piers has suffered extensive deterioration at numerous locations. Additionally, previous ice damage to the stoplog piers requires that the reservoir water levels be dropped each winter. The headworks at the North Side Canal and South Side Canal also show serious concrete deterioration similar to the spillway conditions. The current conditions of the Minidoka Dam spillway and headworks present increasingly difficult reliability and maintenance problems. The need is for Reclamation to be able to continue meeting its contractual obligations for water delivery, power generation, and commitments to provide flow augmentation water under the Nez Perce Settlement Agreement and the ESA. A partial or complete failure of the spillway or canal headworks could threaten Reclamation's ability to meet those obligations.

DESCRIPTION OF THE PROJECT

Location and Setting

Minidoka Dam is a combined diversion, storage and power structure located on the Snake River in south-central Idaho about 6 miles south of Minidoka, Idaho, and east of Rupert on County Road 400 North. The reservoir, extends 26 miles up the Snake River and has an active storage capacity of 95,200 acre-feet, with 80 miles of shoreline. The widest sections of the reservoir are generally referred to as Lake Walcott, though this may apply to the entire reservoir, as well.

All of the proposed action area is within the Minidoka National Wildlife Refuge (Refuge). However, Reclamation has retained exclusive management of an area immediately upstream and downstream of Minidoka Dam (the Reclamation Zone) for operations, maintenance, and security purposes wherein the footprint of the proposed action lies. The Refuge is managed by the Service subject to a Memorandum of Understanding (MOU) signed between the two agencies on April 23, 1964. Lake Walcott State Park (State Park), a Reclamation-developed public recreation site with boating, day use, and camping facilities, is also located within the proposed action area. Reclamation has a lease agreement with Idaho Department of Parks and Recreation (IDPR) to manage the 140-acre State Park for public recreation. The State Park is located within the Refuge, but is excluded from management by the Service.

The general area of the proposed action provides a variety of recreational opportunities. The State Park provides picnicking, boating, camping facilities, and other recreational activities. Fishing occurs along the Snake River, below the spillway, in portions of the canals, and in Lake Walcott. Boat access to the Snake River exists below Minidoka Dam on both sides of the river; local anglers frequently fish both the north and south banks of the river.

Vegetation in the area of the proposed action consists of a variety of trees, grasses, and shrubs in the State Park, to sagebrush, native grasses, and riparian areas along the reservoir and river, and below Minidoka Dam and spillway area. The 2,385-foot spillway creates a large wetland area below the structure, which provides fish and wildlife habitat for a variety of species.

Background and Existing Facilities

The Minidoka Project, one of the earliest Federal reclamation projects in Idaho, includes four other reservoir dams in the Snake River drainage upstream of Minidoka Dam. The Project serves lands north and south of the Snake River. The original Project included Minidoka Dam and spillway, the related reservoir, a hydroelectric powerplant, and two irrigation delivery units, one primarily served by gravity flow (North Side Canal) and the other using gravity diversions and aided by three lift stations (South Side Canal).

Built in 1904 to 1906, Minidoka Dam was the first structure completed by Reclamation for the Minidoka Project. The dam raises the level of the Snake River to reach the headworks for the canals that supply the two irrigation units. The dam also provides irrigation water storage and creates power that is delivered to Bonneville Power Administration (BPA) for marketing. The main North Side Canal headworks are located just north of the powerhouse, while the main South Side Canal headworks lie to the south of the dam, at the end of a 2,385-foot long spillway beginning at the facility's south dike. The original powerplant, completed in 1910, immediately north of the dam's north abutment, supplies electricity to run the Project pumping plants, including the lift stations for the South Side Canal. Lands around Lake Walcott are withdrawn by Reclamation and managed by the Service as part of the Refuge which was established in 1909.

The North Side Canal officially opened in 1907 and has been operated by the Minidoka Irrigation District (MID) since January 1, 1917. The South Side Canal became officially open in November 1915. The South Side Canal pumping unit relies on three electric pumping plants, or

"lift stations," to raise water from the main South Side Canal. Burley Irrigation District (BID) has operated the pumping unit, including the South Side Canal but not its gravity diversions, since January 1, 1917. Neither of the canals are outfitted with fish passage barriers such as fish screens.

The Minidoka Dam spillway was designed to pass the largest flood that the facility would be expected to experience. Starting at the south abutment of the dam, a simple overflow spillway of the ogee weir type was to run southward for approximately 2,385 feet. The headworks for the main South Side Canal are located at the south end of the structure. To increase the capacity of Lake Walcott, Reclamation placed reinforced concrete piers fitted with 6-foot stoplogs along the top of the spillway during the winter of 1909 to 1910. A walkway along the top of the piers allowed workers to place and remove the stoplogs by hand, thus controlling the height of the reservoir.

To increase efficiency at the dam and to improve the ability to convey water supplies to water users, Reclamation installed four 10-by-12 foot motor-operated radial gates in 1913 to better control the discharge. In 1989, these devices were replaced by three 20-by-15 foot radial gates. The remaining sections of the spillway (298 bays) still include hand-placed stoplog boards. Reclamation installed Unit 6 in 1927 and Unit 7 in 1942 to increase megawatt production to meet growing irrigation and power needs in nearby towns.

Units 1 through 5 in the Minidoka Powerplant were decommissioned in 1993 to 1994 and are preserved in place in the powerplant. Unit 6 has been replaced and modern controls have been installed for both Units 6 and 7. Units 8 and 9 were added in 1997 with the completion of a new powerplant, the Allen Inman Powerplant (Inman Powerplant), constructed near the left abutment of the embankment portion of the dam. With these changes, the combined generating capacity was increased from 13,400 kilowatts to about 28,500 kilowatts. The combined water volume/flow capacity of both powerplants is 8,670 cubic feet per second (cfs). These activities were completed in 1997. Flows directed over the spillway were reduced as a result of the powerplant's increased capacity. Artificial wetland ponds were constructed below the spillway as part of mitigation for these reduced flows and for installation of the Inman Powerplant.

Current Operations

Minidoka Dam is operated as a run-of-the-river project with a few seasonal variations. Water is routed through turbines in the two powerhouses, through spillway gates, and over the spillway. Depending upon the water conditions and time of year, the flows between the powerhouse and spillway are partitioned differently. The minimum flow released over the spillway is 1,300 cubic feet per second (cfs) from April 15 to June 30 and from September 1 to September 15. From July 1 through August 31, the minimum flow is increased to 1,900 cfs. Water operations from April 1 to April 14 and again from September 16 until October 31, deliver the first 5,035 cfs of flow through the powerhouse. The next available 1,300 cfs is discharged over the spillway. Flows in excess of 6,335 cfs are routed through the powerhouse until it reaches its hydraulic capacity before additional flows are released over the spillway. Spillway releases travel through a natural wetland below the spillway. A portion of water supplying the wetlands is from subsurface seepage locally enhanced by the reservoir and seepage through the spillway structure.

Additionally, the pipeline from the Inman Powerplant headworks feeds the wetland ponds that were constructed as mitigation for the Inman Powerplant.

There are no controlled spillway releases during the winter months. The physical condition of the existing spillway constrains winter operations because the ogee crest is not capable of resisting the loads imposed by ice on the reservoir surface. Additionally, if water was stored above the crest, leakage through the joints of hundreds of boards would cause an unmanageable accumulation of ice immediately below the structure. Construction joints and other voids in the existing concrete ogee pass some water from the reservoir to the spillway area.

The exact volume of water flowing through the spillway portion of Minidoka Dam via structural leakage and subsurface seepage is difficult to determine. A U.S. Geological Survey (USGS) gaging station (USGS 13081500 Snake River near Minidoka Idaho, at Howells Ferry) is located in the Snake River below the spillway outlet to the river. By subtracting power plant flows from flows recorded at the gaging station, the flows have been estimated to range from 8 cfs to 55 cfs. These are also the approximate flow rates into the spillway wetlands in winter, when there are no controlled water releases through the spillway.

During the irrigation season, typically defined as April through October, the reservoir is maintained at full pool (elevation 4,245 feet). After irrigation season and during the winter months, the reservoir is held between elevation 4,239.5 and 4,240.0 (5.5 feet to 5.0 feet below full) because of the deteriorated structural condition of the existing spillway. Once the ice cover melts, or the threat of substantial freezing has passed, the reservoir is brought up to full pool elevation. Depending on demand and weather, this usually begins mid-March and is completed by the end of April. Reservoir draft and refill rates are dependent upon water year type, irrigation demands, and water availability.

In drier type years when system storage above the project is nearing depletion, reservoir drafting may begin as early as mid-August. If the upstream reservoirs are not severely depleted, water may be delivered from late September through mid-October for irrigation demands, thus keeping the reservoir at full pool longer. Capacity of the South Side Canal is reduced as Lake Walcott drops below elevation 4,243.0 feet and is severely constrained at elevation 4,240.0 feet. Because of the limited head available through the headgates, changes in water surface elevation are avoided to reduce headgate operations or fluctuations in canal flow. Drafting of Lake Walcott storage is avoided until diversion demand, especially on the South Side, is reduced.

The minimum flow measured below the project at the USGS gage at Howells Ferry during the period between 2000 and 2008 is approximately 500 cfs during the winter months. This recorded minimum flow is comprised of both powerhouse and spillway flows as well as seepage.

Because of the deteriorated condition of the concrete in the spillway, a number of structural analyses of the spillway were completed in the 1980s and 1990s. Analyses results revealed stability problems in the overflow section of the spillway and the South Side Canal headworks. Designs for remediation of the overflow section were then completed and the repair work was conducted in the mid-1990s during the construction of the Inman Powerplant. No remediation work for the South Side Canal headworks was ever completed due to its low probability of

failure; therefore, it will be necessary to continue the seasonal 5-foot drawdown. As the concrete in the spillway and headworks continue to deteriorate, maintenance requirements will increase, subsequently increasing annual maintenance costs. As the spillway concrete deteriorates further, a program of pier replacement will become necessary. The pier replacement program will involve replacing one or more piers annually to maintain the spillway in a usable condition. As material and labor costs increase and as the location of piers to be replaced becomes more difficult to access, the annual pier replacement costs will increase considerably. Maintenance requirements and costs will also continue to escalate for the headworks due to the same deterioration and maintenance requirements cited for the spillway issue. Eventually, annual concrete repairs on the headworks will also become necessary. These repairs will continue until the headworks reach the end of their service life and full replacement becomes necessary.

Proposed Action—Spillway and Headworks Replacement, Alternative B (Reclamation Preferred Alternative)

New Structures & Improvements, Changes in Operations

This alternative consists of the following new structures and improvements:

- Overflow Spillway
- Gated Spillway
- Dike
- South Side Canal Headworks
- North Side Canal Headworks
- Public Use Improvements
- Designation of Special Use Areas

The new overflow and gated spillways and the dike would be constructed entirely downstream of the existing spillway, and the new canal headworks would be constructed downstream of existing headworks, allowing use of existing structures as cofferdams. The new overflow spillway would have a total length of approximately 1,316 feet with a uniform crest elevation of 4,245.0 feet and be constructed of roller compacted concrete.

Following completion of the new spillway, partial demolition of the existing spillway will be completed. Portions of the pier removal may occur in wet conditions, depending on the reservoir elevation and the elevation of the surrounding ground surface. Total removal of the existing spillway would be necessary in certain areas such as upstream of the new gated spillway structure. Best management practices (BMPs), such as the use of silt curtains or other appropriate sediment control actions, would be employed to control sediment releases during pier removal in order to protect water quality and endangered snail habitat.

It is anticipated that construction of the new overflow spillway may reduce the current rate of structural leakage to the wetland. Therefore, as part of the new design to satisfy post-construction wetland flow needs, a total of five water release point features with slide gates and steel pipes would be constructed. The slide gates and steel pipe would be installed along the new overflow spillway to maintain the wetland habitat conditions downstream of Minidoka Dam's existing spillway over the full range of reservoir water surface elevations. The maximum design

flow through four of the water release features is 100 cfs. The maximum design flow through the fifth water release feature is 300 cfs. The fifth water release structure, with the 300 cfs capacity, would be located in association with the north radial gate on the new gated spillway. After construction of the new spillway, Lake Walcott's water surface would no longer be constrained to elevation 4,240.0 feet, or below, in winter. Water rights, provisions of spaceholder contracts, commitments to implement Biological Opinions, and Total Maximum Daily Loads (TMDL) would not change under this alternative. Late season drawdown time, corresponding with late season irrigation needs, is expected to last no more than 2 months (September through October) under the proposed action. Once irrigation demand is less than the natural supply and water is available for storage, and absent any extraordinary needs, Lake Walcott would be raised to its normal full capacity. Water rights allow refill of Lake Walcott in a matter of days once its water rights are in priority.

The target winter flow through the natural wetland below the spillway is 100 cfs. Data from the USGS flow gage at Howell's Ferry will be used to estimate the amount of subsurface seepage and structural leakage. Leakage through the new structure is expected to be extremely low. To replace the leakage which currently occurs across the spillway during the non-irrigation season, up to 100 cfs would be discharged through the spillway at release point 3, depending on the amount of seepage estimated using the USGS flow gage data. The non-irrigation season flows of 100 cfs would consist of a combination of structural leakage, subsurface seepage, and controlled releases. However, the winter release flow through the conduits would not exceed 100 cfs.

During the irrigation season, approximately April 1 through October 15, targeted minimum spillway release flows would be 500 cfs. Spillway releases would be as follows: approximately 50 cfs through each of the four northern-most release points and approximately 300 cfs through the southern-most release point. Spillway flows would be increased if sufficient water is available after powerhouse hydraulic capacity is met. With construction of the new spillway, the minimum flow through the project outside of irrigation season would be approximately 600 cfs. This total minimum flow includes both powerhouse and spillway releases measured at the downstream USGS gage (USGS 13081500 Snake River near Minidoka Idaho, at Howells Ferry). The difference between the proposed minimum spillway flows of 500 cfs and the current minimum flows of 1,300 to 1,900 cfs, when available, is expected to be routed through the powerplants up to their capacities.

Included with the new spillway would be a new service road. The road would be located just downstream of the new overflow section and will be constructed in two sections. The first section would run from the existing Inman Powerplant headworks south to the existing gated spillway structure. The second section would run from the existing spillway access bridge north to the existing gated spillway structure. The service road would be constructed using roller-compacted concrete. In addition, the contractor would be required to remove the asphalt surface from the existing access bridge. The service road would be closed to the public for vehicle traffic.

It is anticipated that blasting would be required to remove rock for the foundation of the new gated spillway structure. In addition, blasting would be required to modify the channel upstream and downstream of the structure. In order to hold the winter reservoir to the current elevation, it

would be necessary for the contractor to complete the upstream excavation partially in wet conditions. The blasting operation would be conducted mostly on the dry rock surface; however, the removal of the blasted material would occur in wet conditions. The blasting and material removal would be required to take place during the non-irrigation season when reservoir surface is at its lowest elevation. BMPs, such as the use of silt curtains, would be employed to control sediment releases during blasting and the removal of blasted material in order to protect water quality and endangered snail habitat. In addition, blasting may be required to improve the channel upstream and downstream of the structure in order to provide for adequate approach velocities to the new radial gates.

A 14-foot-wide gate hoist bridge would be constructed over the radial gate spillway structure. This bridge would accommodate setting the radial gate hoists and lift motors and allow maintenance personnel to cross the structure. Security fencing would be installed around the structures.

The South Side Canal headworks would be reconstructed in the existing canal about 300 feet downstream of the existing headworks. The majority of the work would be performed during the non-irrigation season (October to March). The existing South Side Canal headworks gates would be closed during construction. Following completion of the new headworks, the majority of the existing structure, including metalwork, would be removed.

The new North Side Canal headworks would be reconstructed in the existing canal about 115 feet downstream of the existing headworks. Work would be performed during the non-irrigation season (October to March). Following completion of the new headworks, all metalwork would be removed from the existing headworks and the existing concrete structure would be permanently abandoned in place. Blasting may be required to remove rock from the upstream side of the new radial gates in preparation for the installation of, and to provide footing for, these gates. Construction of the new North Side Canal headworks structure would require the removal of the existing bridge which spans the North Side Canal.

Currently, substantial fishing and birding opportunities exist in association with the existing spillway structure. Under Alternative B, some fishing and birding opportunities would be eliminated as a result of structural limitations and the closure of the new spillway structure and canal headgates to public access. This bridge crosses the pool below where the new spillway radial gates would be located and is currently open to non-vehicular public use such as fishing and birding. Additionally, a parking area that is accessible to people with disabilities would be provided near the south end of the bridge.

Reclamation is proposing to designate Special Use Areas as provided for in 43 CFR Part 423 in order to allow the continuance of traditional uses which would otherwise be prohibited. Reclamation will restrict uses which affect public safety. The Special Use Areas would allow for wading and float tubing associated with fishing, birding, and ice fishing. Existing restrictions as described in 43 CFR Part 423, Subpart C, would remain in effect.

Construction

Construction is expected to take approximately 31 months and would involve one prime and numerous subcontractors. Five staging and/or waste areas have been identified, three on the north end of the construction zone and two on the south end. Four of the five staging areas are proposed to be restored and reseeded post-construction.

It would be necessary for the contractor to stage construction in such a way that water delivery to the canals continues uninterrupted during the irrigation season. This would most likely be accomplished by conducting construction in and around the canals in winter months only. Water releases in the spillway area would be interrupted in areas of ongoing construction. Throughout the entire construction period, flows would be maintained to and through the spillway. Multiple release points would be utilized to provide and maintain flows through the spillway to meet existing ESA requirements in the spillway wetlands during all construction.

ALTERNATIVE ACTIONS

The No Action Alternative, describing current operations, condition of existing spillway and canal structures, and expected consequences (increased maintenance and costs) if no new actions are authorized, is described above under Current Operations.

Alternative C would be the same as Alternative B (Preferred Alternative), except that the canal headworks would not be replaced. The two irrigation districts serviced by the Minidoka Dam would provide key funding to complete canal headworks replacement, and were concerned about potential costs of replacing the headworks. Consequently, Reclamation developed Alternative C to analyze the project without replacing the canal headworks.

FISH AND WILDLIFE RESOURCES

Vegetation

Upland vegetation within and surrounding the project area is a mix of agricultural land, fragmented disturbed habitat dominated by rabbitbrush (*Chrysothamnus spp.*) and cheatgrass (*Bromus tectorum*), and some areas in relatively good range condition with a shrub-steppe mix of native bunchgrasses and forbs, introduced crested wheatgrass (*Agropyron cristatum*), cheatgrass, and sagebrush (*Artemisia tridentata*). Scattered trees, open savannah, and closed stands of Rocky Mountain juniper (*Juniperus scopulorum*) and Utah juniper (*Juniperus osteosperma*) occur on the north and south shores of the reservoir. Pockets of shrub-steppe vegetation are also interspersed among the pools, stream channels, and wetland vegetation in the wetlands below the spillway, and occur in some of the areas proposed for staging areas.

Existing riparian vegetation in the project area is currently found on about 41 acres (Martin and Mueleman 1989, Mueleman et al. 1991). A few riparian areas occur in larger pockets, but most riparian zones around the reservoir tend to be narrow and linear, usually only one tree wide between the water (full pool) and basalt rock. Typical riparian species include willows (peachleaf (*Salix amygdaloides*), Pacific (*Salix lucida*), and coyote (*Salix exigua*)), skunkbush sumac (*Rhus trilobata*), Russian olive (*Elaeagnus angustifolia*), green ash (*Fraxinus*

pennsylvanica), Chinese elm (*Ulmus parvifolia*), and a few eastern cottonwood (*Populus deltoides*). Riparian invasive species and weed species include Russian olive, Canada (*Cirsium arvense*) and Scotch (*Onopordum acanthium*) thistles, poison hemlock (*Conium maculatum*), and Russian (*Acroptilon repens*) and diffuse (*Centaurea diffusa*) knapweeds.

Wetland vegetation, or aquatic macrophytes, are found in the reservoir in coves, bays, protected shorelines, in the drawdown zone, and also occur in the spillway wetlands. Emergent vegetation may include reeds (*Phragmites spp.*), bulrushes (*Scirpus spp.*), cattails (*Typha spp.*), and spikerushes (*Eleocharis spp.)*. Submersed wetland vegetation includes such species as pondweeds (*Potamogeton spp.*), including sago pondweed (*Potamogeton pectinatus*). Floating-leaved vegetation, occurring in areas that do not periodically dry out, includes (*Nymphaea spp.*), spatterdock (*Nuphar spp.*), and watershield (*Brasenia schreberi*). Free-floating vegetation includes duckweed (*Lemna spp.*). Wetland vegetation provides habitat for both terrestrial and aquatic animal species.

Wildlife Resources

Large game mammals utilizing the uplands within and surrounding the project area generally include a small number of mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocarpa americana*).

Large fur-bearing mammals occurring in upland parts of the proposed action area include coyote (*Canis latrans*), red fox (*Vulves vulpes*), badger (*Taxidea taxus*), and striped skunk (*Mephitis mephitis*). Raccoons (*Procyo lotor*), beaver (*Castor canadensis*) muskrats (*Ondatra zibethica*), long-tailed weasels (*Mustela frenata*), and mink (*Mustela vison*) occur below the existing spillway and around the reservoir shoreline and wetlands. Small mammals common to the area include black-tailed jackrabbits (*Lepus californicus*), montane voles (*Microtus montanus*), and deer mice (*Peromyscus maniculatus*).

Amphibians and reptiles expected to occur in the proposed action area include long-toed salamanders (*Ambystoma macrodactylum*), pacific treefrogs (*Hyla regilla*), leopard frogs (*Rana pipiens*), western chorus frogs (*Pseudacris triseriata*), longnose leopard lizards (*Gambelia wislizenii*), side-blotched lizard (*Uta stansburiana*), racers (*Coluber constrictor*), gopher snakes (*Pituophis melanoleucus*), garter snakes (*Thamnophis spp.*), and western rattlesnakes (*Crotalus viridis*).

The Refuge has been designated an Important Bird Area (IBA). The international Important Bird Area Program designates areas of global importance for their high habitat value for birds. The Refuge was designated an IBA for its colonial nesting bird populations and for the numbers of molting waterfowl. Over 230 species of birds have been observed on the Refuge since 1950 (U.S. Fish and Wildlife Service 2002), and 85 species are known to nest there. Species groups attracted to the Refuge and surrounding area include neo-tropical migrants, waterfowl, shorebirds, wading birds, raptors, and upland bird species.

Common non-game upland species include common nighthawks (*Chordeiles minor*), western kingbirds (*Tyrannus verticalis*), sage thrashers (*Oreoscoptes montanus*), loggerhead shrikes

(*Lanius ludovicianus*), and Brewer's sparrows (*Spizella breweri*). Upland game birds include pheasant (*Phasianus colchicus*), gray partridge (*Perdix perdix*), mourning dove (*Zenaida macroura*), sharp-tailed grouse (*Tympanuchus phasianellus*), and greater sage grouse (*Centrocercus urophasianus*).

Some raptor species that commonly nest on the Refuge include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and burrowing owl (*Athene cunicularia*). Raptors less common during migration or summer include prairie falcon (*Falco mexicanus*), Swainson's hawk (*B. swainsoni*), ferruginous hawk (*B. regalis*), turkey vulture (*Cathartes aura*), short-eared owl (*Asio flammeus*), Osprey (*Pandion halaietus*) and great horned owl (*Bubo virginianus*). The Refuge is important wintering habitat for raptors such as rough-legged hawk (*Buteo lagopus*), bald eagles (*Haliaeetus leucocephalus*), red-tailed hawk, and prairie falcon. Northern goshawks (*Accipiter gentilis*) and golden eagles (*Aguila chrysaetos*) may also be present in winter.

Waterfowl species most likely to utilize the project area include mallards (*Anas platyrhynchos*), gadwalls (*A. strepera*), and cinnamon teal (*A. cyanoptera*). Fewer numbers of redheads (*Aythya americana*), ruddy ducks (*Oxyura jamaicensis*), pintails (*Anas acuta*), American wigeon (*Anas americana*), and northern shovelers (*Anas clypeata*) breed in the Refuge area and may occasionally use drain water wetlands. Wintering waterfowl include Canada geese (*Branta canadensis*), mallards, pintails, gadwalls, American wigeon, northern shovelers, and green-winged teal (*Anas crecca*). Tundra swans (*Cygnus columbianus*) forage in grain fields in relatively low numbers during migration, and trumpeter swans (*Cygnus buccinator*) are occasionally observed in the project area. Based on aerial waterfowl surveys conducted by the IDFG, since 1966 fall-winter waterfowl numbers on Refuge have ranged as high as over 161,000, but have decreased in recent decades (numbers have not been over 50,000 since 1978).

Great blue herons (*Ardea herodias*), American avocets (*Recurvirosta americana*), long-billed curlews (*Numenius americanus*), killdeer (*Charadrius vociferous*), and other shorebirds and water birds use the larger wetlands, as do red-winged blackbirds (*Agelaius phoeniceous*). In addition, eared grebe (*Podiceps nigricollis*), western grebe (*Aechmophorus occidentalis*), Clark's grebe (*Aechmophorus clarkii*), Sabine's gull (*Xema sabini*), and several other species of gulls use the area just below the dam during the summer. Several thousand white pelicans (*Pelecanus erythrorhynchos*) nest on the Refuge. The adults fly long distances to forage, and Lake Walcott may be the sole nesting site for most white pelicans in southern Idaho.

Fish Resources

Fish species in the project area will use not only wetlands (primarily wetland areas with emergent species such as cattails, bulrush, and sedges), but also shallow unvegetated bays and areas of rock and boulders. Emergent macrophytes provide spawning habitat and nursery areas for many of Lake Walcott's fish species. Small fish species and juveniles of larger species forage on aquatic invertebrates in the emergent beds, and the vegetation provides cover from fish predators. Rocky areas are also used as cover by many species. Shallow, unvegetated flats provide good habitat for the juveniles of many species.

Fish species common in Lake Walcott and in the spillway wetlands include common carp (*Cyprinus carpio*), rainbow trout (*Oncorhynchus mykiss*), redside shiner (*Richardsonius balteatus*), sculpin species, sucker species, smallmouth bass (*Micropterus dolomieu*), chub species, and yellow perch (*Perca flavescens*). White sturgeon (*Acipenser transmontanus*) occur in Lake Walcott. The historic range of white sturgeon was below Shoshone Falls on the Snake River, but the IDFG has introduced them into areas of the mid-Snake River above Minidoka Dam. Older individuals will reach reproductive age in the next few years. Rainbow trout populations in the reservoir are not self-reproducing; IDFG stocks only sterile rainbow trout. Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*) may infrequently enter the upper end of Lake Walcott.

Threatened, Endangered, and Candidate Species

Five species of aquatic mollusks endemic to the middle Snake River or tributaries or springs were listed as endangered or threatened in 1992 (57 FR 59244). The Banbury Springs lanx (*Lanx spp.*), the Idaho springsnail (*Pyrgulopsis idahoensis*), the Snake River physa (*Physa natricina*), and the Utah valvata (*Valvata utahensis*) were listed as endangered. The Bliss Rapids snail (*Taylorconcha serpenticola*) was listed as threatened. These species were listed due to declining distribution within the Snake River, adverse habitat modification and deteriorating water quality from hydroelectric development, peak-loading effects from water and power operations, water withdrawal and storage, water pollution, and inadequate government regulatory mechanisms. The U.S. Fish and Wildlife Service (1995) recovery plan for these species includes short- and long-term multi-agency objectives to restore viable, self-reproducing colonies of the listed snails. The Idaho springsnail was delisted in 2007. Two of the five listed species, Utah valvata (UV) and Snake River physa (SRP), are known to occur within the area of impact.

UV are usually found in lower velocity habitats of free-flowing river or spring habitat, or in reservoirs (U.S. Fish and Wildlife Service 1995; Weigel 2002, 2003; Newman 2007, 2008). They are typically associated with fine sediments (less than 0.25 mm diameter) or gravels mixed with interspersed fines and can tolerate a wide range of dissolved oxygen concentrations (Newman 2007, 2008). The species is absent from boulder and bedrock substrates. UV occur throughout the entire area of impact, with highest densities (up to 2,000 live individuals per square meter) found in Lake Walcott (Weigel 2002). Lake Walcott has a uniform bottom, dominated by fine substrates (Newman 2007; Weigel 2002) providing vast expanses of suitable habitat for UV. UV are also found below the spillway, in the same pool where SRP have been found (see below), occurring on fine substrates.

SRP are known only from the Snake River. At the time of their listing, SRP was thought to require clean, cold, well-oxygenated, swift water with low turbidity (U.S. Fish and Wildlife Service 1995), with boulders or rocks as substrate. More recent information indicates that SRP are primarily associated with sand-gravel-cobble substrates, and are more typically encountered in the river thelwag and in areas with steady current. The specific environmental conditions necessary for SRP reproduction and recruitment are unknown. At the time of listing, SRP was thought to have existed historically on the Snake River in Idaho from Grandview upstream through the Hagerman Reach. Prior to 2009 only three colonies were believed to remain, including the colony located immediately downstream of Minidoka Dam spillway, found during

surveys conducted by Reclamation in 2005. In 2009 a review of vouchered live-when-captured Physidae specimens collected between 1995 and 2003 from the Snake River extended the range of SRP from the previous downstream boundary near Grandview, Idaho, downstream to Ontario, Oregon (Keebaugh 2009a).

The bald eagle was removed from the Federal list of threatened and endangered species in June, 2007. Section 4(g)(1) of the ESA requires the Service, in cooperation with the States, to implement a monitoring plan for not less than 5 years for all species that have been recovered and delisted. The Service is currently recommending monitoring bald eagles for 20 years. Bald eagles use the Snake River in this area extensively in the winter and are primarily associated with black (*Populus balsamifera* ssp. *trichocarpa*) or narrowleaf (*Populus angustifolia*) cottonwood galleries between Palisades Dam and American Falls Reservoir.

There is one bald eagle nest on Bird Island in Lake Walcott. Otherwise, most bald eagle activity in the project area consists of migrating and foraging eagles. There are typically 10 to 20 bald eagles along Lake Walcott during the winter until the water freezes. When the reservoir freezes, the eagles located at the west end of the reservoir move below Minidoka Dam to forage on fish and waterfowl, and the remaining eagles travel to other foraging locations.

A petition to list the yellow-billed cuckoo (*Coccyzus americanus*) was filed in 1998. In July 2001, the Service announced a 12-month finding for a petition to list the yellow-billed cuckoo as threatened or endangered in the western United States, but listing was precluded by higher priorities. As of April, 2009, this species continues to have Candidate status. Most Idaho records are of isolated, non-breeding individuals (U.S. Fish and Wildlife Service 1985). Breeding populations of yellow-billed cuckoos in Idaho are believed to be extirpated (Reese and Melquist 1985). Suitable habitat may exist in the more dense riparian stands along Lake Walcott and in the spillway below Minidoka Dam.

Idaho State Species of Greatest Conservation Need

The IDFG has provided a list of Species of Greatest Conservation Need (SGCN) that are known to occur in the project area:

California Floater (*Anodonta californiensis*)
Utah Valvata
American White Pelican
Black-crowned Night-heron (*Nycticorax nycticorax*)
Trumpeter Swan
Bald Eagle
Franklin's Gull (*Leucophaeus pipixcan*)
California Gull (*Larus californicus*)
Black Tern (*Chlidonias niger*)
Caspian Tern (*Hydroprogne caspia*)
Cattle Egret (*Bubulcus ibis*)
Snowy Egret (*Egretta thula*)
Clark's Grebe
Western Grebe
Long-billed Curlew (*Numenius americanus*)
White-faced Ibis (*Plegadis chihi*)
Yellow-billed Cuckoo
Northern Leopard Frog

Habitat has been previously described for species' guilds or for individual species listed as Idaho SGCN in the project area, with the exception of the California floater. A freshwater mussel, the

California floater occurs in lakes and lake-like stream environments (NatureServe 2009). Its current range and ecological requirements are in question due to its uncertain taxonomic status.

METHODOLOGY

Due to the restricted time frame for implementation imposed on the project with the appropriation of funds, opportunities to design and conduct field investigations or to gather data with which to evaluate the potential for project impacts to fish and wildlife resources were limited. The Service assisted with a Reclamation sampling effort that concluded that listed snails were unlikely to occur in a spillway pool that will be impacted by construction and subsequently inundated behind the new spillway. We also conducted an analysis of the timing, duration, and frequency with which proposed minimum summer spillway flows of 500 cfs could occur, using flow data from the USGS flow gage at Howell's Ferry.

Other methods included a site visit with personnel from IDFG, Reclamation, and the Refuge to view the spillway area; use of information contained in the project DEIS; review of other existing information on the project area, which included a 1980 FWCA Final Report, wildlife impact assessments and mitigation plans for the reservoir; and review of other documents and information provided by IDFG, the Refuge, and Reclamation via emails and in phone conversations.

FUTURE WITHOUT THE PROJECT

Wildlife Resources

Without the project, reservoir operations will essentially stay the same and the water levels will continue to fluctuate and be drawn down during the winter months. Upland vegetation will not be affected without the project.

Mammalian communities are not expected to be adversely impacted. The diversity, distribution, and relative abundance of mammals using the reservoir and spillway without the project are expected to remain the same. The spillway provides a diversity of habitats and food for a range of mammal species, and current conditions and trends in the spillway would be expected to continue. Large fur-bearing mammals occurring in uplands and riparian areas will continue to benefit from the drawdowns which create access onto mud flats and provide food and travel corridors.

Some water fluctuation is beneficial for wetlands. The 5-foot winter drawdowns allow large areas to dry and/or freeze, killing many aquatic macrophytes and favoring early seral wetland vegetation. Sago pondweed, an early seral species, is a highly preferred waterfowl forage plant which responds to drying lake substrates. The extended drawdowns result in maintaining or increasing sago pondweed, benefitting waterfowl that use the reservoir. The current drawdown allows the lake bottom less than 5 feet deep to freeze annually. This prevents the establishment of Eurasian milfoil (*Myriophyllum spicatum*), a highly prolific, invasive submergent aquatic species. Eurasian milfoil is not currently known to be present on the Refuge. These conditions and trends would be expected to continue without the project.

Reptile and amphibian communities in the proposed action area are not expected to be adversely impacted without the project. The diversity, distribution, and relative abundance of reptiles and amphibians using the habitat around the reservoir are expected to remain the same as in current conditions.

Not implementing the project leaves the spillway and headworks in their present configuration. As the concrete in the spillway and headworks continues to deteriorate, maintenance requirements will increase. A program of pier replacement will probably become necessary, which will involve replacing one or more piers annually to maintain the spillway in a usable condition. Past pier replacement projects have resulted in localized and minor impacts to wildlife and vegetation, which would be expected for future pier replacement without the project. Annual concrete repairs will eventually be required for the canal headworks, as well. Similar to past pier replacement, impacts to wildlife and vegetation from headworks repair would be expected to be localized, minor, and short-term.

Fish Resources

Without the project, current reservoir and spillway operations would continue. Current stands of aquatic macrophytes and shallow, unvegetated flats would remain relatively unchanged in character. Lake Walcott is currently held at full pool during spring fish spawning periods and through August, providing fish spawning and nursery habitat, and habitat for juvenile fish in the vegetation beds, shallow flats, and lava rock and boulders. This would continue without the project.

Overwintering habitat is important for both young and juvenile fish, particularly for smallmouth bass which need adjacent cover for optimum survival. Without the project the 4 to 5 month drawdown beginning in September or October (depending on water type year) and continuing through winter until refill begins March 1st would continue. During this time all of the aquatic macrophytes and much of the rock and boulders would be exposed, and hence not available as cover. Young smallmouth bass and other species would continue to be at increased risk of predation because of the reduced amount of hiding cover.

Overall, fish populations in the reservoir would remain unchanged. Juvenile smallmouth bass would continue to be exposed to predation during drawdown periods. Rainbow trout populations are dependent on stocking levels; conditions in the reservoir would remain unchanged for rainbow trout.

Under current operations non-game and game fish are subject to entrainment through the Inman Powerplant, the spillway, and spillway radial gates. Entrainment supports a long-standing trout fishery, popular with local communities, below the spillway and the dam. Significant numbers of entrained smallmouth bass are also caught below the spillway. IDFG personnel have stated in phone conversations that numbers of fish entrained into the South Side Canal makes establishing a stable fish population in the reservoir difficult. Entrainment through existing structures would continue to occur without the project. The current level of entrained rainbow trout and smallmouth bass into the spillway wetlands would continue. Existing fish habitat conditions and trends in the spillway wetlands would continue without the project.

Without the proposed project, maintenance replacement projects would become increasingly necessary as concrete in the spillway and canal headworks deteriorates. This would result in temporary disturbance of fish habitat in the immediate construction area. As in past replacement projects, BMPs will be required for all work performed, and disturbance and impacts to fish and habitat, including sediment deposition, would be expected to be minor and short-term.

Threatened, Endangered, and Candidate Species

Current distribution, abundance, or colony viability of UV in the reservoir would not be expected to change without the project. At least some of the lake bottom above 5 feet that is exposed during the extended existing winter drawdowns represents potential habitat that UV cannot currently colonize because it cannot withstand drying or freezing conditions. This would remain unchanged. Current summer spillway flow rates and winter seepage result in deposition and maintenance of fine sediments into the pool below the spillway where UV are consistently found, and would likely continue to maintain substrate conditions selected by this species in the pool. This would likely continue without the project. The continued existence of SRP in the same pool where UV are found would be expected to continue without the project, due to current flows maintaining substrates selected by SRP in the pool. There is anecdotal evidence of the presence of what may be a type of mat algae on rocks in the spillway pools. A similar type of plant formation has been found on rocks elsewhere in the Snake River. Snails have generally not been found on rock covered with this same kind of matting (Keebaugh 2009b).

There would be no expected impacts to bald eagles without the project. Bald eagles would likely continue to nest in cottonwood trees on Bird Island. Bald eagle use of the reservoir and below the spillway would be expected to continue. Impacts to bald eagles from pier and canal headworks maintenance and replacement would be expected to be negligible to minor short-term impacts from noise and disturbance, and should not significantly impede foraging activities.

Small, isolated pockets of habitat suitable to yellow-billed cuckoos occur along Lake Walcott and below the spillway. Yellow-billed cuckoos have never been observed to occupy this habitat, and would not be expected to do so in the future due to the habitat isolation and lack of connectivity.

Idaho State Species of Greatest Conservation Need

Current abundance and distribution and habitat condition and trends for Idaho Species of Greatest Conservation Need would be expected to continue without the project.

FUTURE WITH THE PROJECT

Fish and Wildlife Resources

Installation of fish screens is not part of the project design for replacing the canal headworks. Entrainment of significant numbers of game and non-game fish would continue to occur under the proposed action.

Effects to fish and wildlife resources as a result of construction are expected to be minor and short-term. Project design features, BMPs, and compensatory mitigation would avoid or

minimize many of the potential adverse effects. Soil will be compacted by the haul road and in staging areas, though proposed reclamation of these sites will significantly restore soil properties affected by compaction. Five construction staging areas are proposed with the project, totaling over 23 acres. Use of staging areas would result in loss of upland habitat. Reclamation has proposed restoring and reseeding four of the five staging areas. Construction would likely result in introduction and/or spread of noxious weeds or undesirable invasive plant species into and around construction areas and staging areas. However, there is no post-construction weed control program proposed. Fish and possible other aquatic organisms may be impacted or killed immediately adjacent to blasting areas. Fish mortality will be documented, and replaced in kind post-construction. Birds and large mammals will be temporarily disturbed and displaced from within and in the vicinity of the construction area during construction. Small mammals, reptiles, and amphibians will be disturbed or killed in small numbers during construction, but the losses are considered minor and short term.

Several impacts expected to occur under the proposed action are associated with the change in length, timing, and depth of reservoir drawdowns; and with changes in spillway flow rates and timing.

The shorter period of time that the reservoir would be below full pool (expected to be no more than two months between September and October) would reduce the time that beds of aquatic macrophytes and rocks and boulders are unavailable as cover to young smallmouth bass and juveniles of other species, thus reducing the period of time they are exposed to predation. This is expected to result in higher survival rates and increases in some fish species' populations, including smallmouth bass.

The proposed change in annual drawdowns would be expected to favor aquatic macrophyte species tolerant of inundation. Abundance of waterfowl plant species requiring extended periods of drying substrates, such as sago pondweed, would be expected to decrease. Decreases in sago pondweed and other preferred forage plants that respond to drying substrates would likely negatively impact some waterfowl species, while the change in forage base could benefit other waterfowl species. The shorter winter drawdown period for Lake Walcott would have the effect of making mud flats and foraging areas for waterfowl available for a shorter period of time, from one-half to two-thirds the time these areas would be available without the project. Migrating and overwintering waterfowl that use these areas can remain on the Refuge in the tens of thousands into late December, depending on how long open water is available on the lake (IDFG aerial waterfowl surveys on the Refuge, 1966 to 2005). If the reservoir is raised to full pool by the first of November in warm winters, waterfowl that normally depend on foraging areas on Lake Walcott during migration may be forced to seek forage elsewhere. Waterfowl migrating northward to nesting grounds in the spring depend on foraging areas located along their route to build energy reserves needed to successfully develop viable eggs. The reservoir is normally not raised to full pool until about the first of April under current operations. Therefore, mud flats and foraging areas now available to waterfowl arriving on the Refuge in March on their way to nesting areas would not be available under proposed operations. Waterfowl would need to expend energy seeking other foraging areas, which might or might not be available.

Reduced drawdown times are expected to result in increases in beaver and muskrat populations. Under current operations, muskrat houses and beaver lodges are above the water line for several months, exposing them to predation. Shorter drawdown times and occasional shallower drawdowns would reduce exposure to predation, likely increasing survival rates and populations of muskrats and beaver. There are few mature cottonwood trees at the Refuge. If beaver numbers increase, there would be increased potential for beaver to forage on and kill existing cottonwood trees, including the one tree currently capable of supporting the bald eagle nest. Muskrat houses are used by nesting geese and swans. Moderate increases in muskrats could benefit nesting waterfowl, but large numbers of muskrats can also decrease or eliminate emergent vegetation, reducing benefits to waterfowl.

Eurasian milfoil, a highly undesirable aquatic species, is not known to occur on the Refuge, probably because, if it becomes established, the annual 5-foot winter drawdown exposes it to freezing substrates, which kills the plant. Under the proposed project, drawdowns will take place for shorter periods during warming months, increasing the possibility of Eurasian milfoil becoming established.

Shorter drawdown periods and occasional reduced drawdown levels could result in UV becoming established on some areas of the lake bed not currently available to them during the 5-foot winter drawdown.

With the proposed project, winter spillway flow rates will increase from the range of 8 to 55 cfs from seepage to a targeted minimum flow rate of 100 cfs from a combination of seepage and release points. This is considered a benefit to species using the spillway wetlands in winter.

However, summer spillway flow rates will be reduced from 1,300 to 1,900 cfs to a minimum target flow of 500 cfs. Reduced flow rates could result in changes in aquatic wetland function below the spillway. Wetland function and water quality parameters such as water temperature; dissolved oxygen; pH; total maximum daily limit; dissolved solids; sediment deposition and distribution; and the abundance, distribution, and diversity of aquatic macrophytes could be impacted, resulting in habitat degradation for some species below the spillway, including rainbow trout and listed snails. Changes in these parameters could result in changes in UV and SRP abundance and distribution in the one spillway pool where they consistently occur. Conditions which contribute to the spread of mat algae on rocks in certain areas of the Snake River are unknown. Therefore, it must be considered that changes in spillway flow rates could potentially result in the spread of mat algae in the pool where UV and SRP are currently found, with potential impacts to SRP abundance and distribution in the pool. Increased water temperatures and other potential changes in water quality below the spillway could benefit summer spillway smallmouth bass populations.

Fish entrainment rates through the new spillway are expected to be similar to existing rates, since the spillway design includes installing water release pipes at depths to draw reservoir trout through the spillway into the pools below. Entrainment would also occur at higher spillway flows when water is directed through the radial gates.

DISCUSSION AND RECOMMENDATIONS

Section 1 of the FWCA provides that "wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs," i.e., conservation measures should not be considered simply as incidental issues to be addressed only if they are consistent with the primary use of a particular project (Smalley and Mueller 2004). Consideration is to be given to all wildlife, not simply those that are legally protected under the Endangered Species Act or those with high economic and recreational value. Section 2(a) directs the Federal action agency to consult with the Service and the State agency responsible for wildlife resources "with a view to the conservation of wildlife resources by preventing loss of and damage to such resources." Further, the recommendations of the Service are to be given full consideration by the action agency. All aspects of the proposed project should be managed to avoid and minimize impacts to wildlife resources. In addition, the FWCA provides in section 2(d) that

> "The cost of planning for and the construction or installation and maintenance of such means and measures adopted to carry out the conservation purposes of this section shall constitute an integral part of the cost of such projects, provided that such cost attributable to the development and improvement of wildlife shall not extend beyond that necessary for (1) land acquisition, (2) facilities as specifically recommended in water resource project reports, (3) modification of the project, and (4) modification of project operations . . ."

Water development projects that result in adverse impacts to fish and wildlife require the development of mitigation plans. These plans consider the value of fish and wildlife habitat affected. The Service has established a mitigation policy used as guidance in recommending mitigation (46 FR 7644). The policy states that the degree of mitigation should correspond to the value and scarcity of the fish and wildlife habitat at risk. Four resource categories in decreasing order of importance are identified:

> Resource Category No. 1: Habitats of high value for the species being evaluated that are unique and irreplaceable on a national basis or in the ecoregion section. No loss of existing habitat value should occur.
>
> Resource Category No. 2: Habitats of high value that are relatively scarce or becoming scarce on a national basis or in the ecoregion section. No net loss of in-kind habitat value should occur.
>
> Resource Category No. 3: Habitats of high to medium value that are relatively abundant on a national basis. No net loss of habitat value should occur and loss of in-kind habitat should be minimized.
>
> Resource Category No. 4: Habitats of medium to low value. Loss of habitat value should be minimized.

Habitats in the immediate project area are classified as follows: Resource Category No. 2 - riparian trees and shrubs, riparian emergent and submergent wetlands, and aquatic habitat.

Riparian habitats are classified in category 2 because they are scarce and are rapidly disappearing in the Columbia River Basin. The Service's mitigation goal for riparian habitat in the project area is no net loss in wildlife value as a result of the proposed project.

Aquatic habitats are classified in category 2 because they are relatively scarce in the Upper Snake River Basin and provide high value for several game fish species such as white sturgeon, rainbow trout, and smallmouth bass; and as foraging habitat for predatory water birds such as white pelicans, cormorants, and grebes. The Service's mitigation goal for aquatic habitat (e.g., backwaters, riffles, runs, and lake habitat) in the project area is to have no net loss of habitat value as a result of the proposed project.

The Service's mitigation policy (46 FR 7644), in order of high to low priority, is to consider the following:

- Avoid the impact.
- Minimize the impact.
- Rectify the impact.
- Reduce or eliminate the impact over time.
- Compensate for Impacts.

The proposed project would include actions that could have both positive and negative impacts on fish and wildlife resources in the project area. Proposed changes in reservoir drawdown periods could benefit fish populations, and impact waterfowl foraging and resting areas. There may be potential for proposed changes in minimum summer spillway flows to effect listed snails below the spillway. These changes could impact the spillway trout fishery, but benefit smallmouth bass that spawn below the spillway.

Changes in Reservoir Operations

Due to the restricted time frame for implementation imposed on the project with the appropriation of funds, there has not been opportunity to map and quantify the extent of the waterfowl use areas (mud flats, waterfowl foraging and resting areas) that would be affected by the shorter drawdown period. If the habitat will be available for a shorter period of time, this could constitute a loss of habitat value. The Service recommends mapping and quantifying the extent of waterfowl fall and spring use areas that could be affected, and conducting an analysis of the magnitude of impacts from proposed changes in drawdown periods on migrating or overwintering waterfowl. Analysis could include (but not be limited to) available annual fall and spring waterfowl survey data on the Refuge.

The significance of the Refuge as an Important Bird Area of global importance cannot be overstated. Reclamation has committed to working with IDFG and the Refuge to develop strategies to adjust the timing and duration of reservoir levels to avoid or minimize impacts to the abundance of preferred waterfowl forage plants, and to control or prevent establishment of invasive aquatic plants such as Eurasian milfoil.

As mitigation to prevent no net loss of in-kind wildlife value (based on the above identified waterfowl mapping efforts and other new or existing wildlife-based inventory/monitoring efforts) in the riparian habitats around Lake Walcott, we also recommend the following: Reclamation should actively seek to obtain and implement the authority and flexibility to adapt reservoir levels to achieve storage commitments and provide power while *maximizing* benefits that will preserve the integrity of the Refuge as an Important Bird Area, support migrating and nesting waterfowl populations, and that will still result in habitat improvement for desirable fish species (e.g. smallmouth bass) in the reservoir.

Choice and measurement of parameters that would achieve the above should be determined in consultation with IDFG, the Service, and the Refuge. Exercising such flexibility could at times mean producing less power in order to avoid or minimize impacts to reservoir fish and wildlife, particularly waterfowl, but also other wildlife resources as determined in consultation with IDFG, the Service, and the Refuge. Exercising flexibility in this manner would meet the intent of the FWCA. It will also be critical in allowing Reclamation to adapt to new conservation issues that will inevitably arise in the future.

There are several other potential losses of wildlife resources from changes in reservoir operations, discussed under Future with the Project, for which effects may not be known or cannot be measured until the new drawdown period is actually implemented.

A cascade effect of decreased predation on beaver could result in loss of cottonwood trees and willow stands due to increased foraging on these species by greater numbers of beaver. Cottonwood trees provide nesting habitat for great blue heron and for the only bald eagle nest on the Refuge, and willow provide habitat for other riparian birds. The same cascade effect could result in increased numbers of muskrats, which could impact the extent of cattail beds, reducing nesting habitat for geese and other migratory birds. As mitigation to prevent no net loss of in-kind riparian tree, shrub, and emergent habitat value, we recommend implementation monitoring of changes in beaver and muskrat populations, and of impacts to cottonwood trees and willow and cattail stands. This will allow linking population numbers with undesirable changes in vegetation. We recommend design and implementation of adaptive management strategies to prevent a net loss of in-kind habitat value for species that use cottonwood trees, willow, and cattail beds. Management strategies could include protecting cottonwood trees with wire, planting cottonwood and willow saplings protected with wire, beaver and muskrat control, and/or manipulation of reservoir levels to encourage predation on beaver and muskrat.

Establishment and spread of Eurasian milfoil or other non-native/invasive aquatic species could result in loss of habitat value for fish and wildlife species that use shallow riparian areas. Monitoring protocols will need to be devised to detect early presence of Eurasian milfoil, should it become established. Management strategies to prevent a net loss of in-kind habitat value in shallow riparian areas, including adapting the timing and duration of reservoir drawdown periods to freeze out milfoil, can then be developed. Monitoring would need to be continued post-treatment to determine if control measures are successful.

The population of northern leopard frogs using riparian habitat around the reservoir likely became established under the current drawdown operations. Northern leopard frogs are a species

of concern at the State and Federal levels. The Service concluded in July, 2009, that there was substantial information indicating that listing the western U.S. population of northern leopard frogs as threatened under the ESA is warranted. The Service is conducting a twelve-month status review of this species.

Potential effects to leopard frogs from proposed changes in reservoir drawdown periods are unknown. We recommend that Reclamation consult with the Refuge and/or IDFG to adopt or develop monitoring protocols to determine if leopard frogs will be affected by the new drawdown periods. If impacts of concern are found, we recommend adoption of a management strategy to avoid a no net loss of in-kind habitat value for leopard frogs.

Changes in Spillway Operations

Hiebert and Bjornn (1980) found that with summer spillway flows in the project area reduced to 670 cfs, there is potential for water temperatures in the pools below the spillway to increase by greater than or equal to 2.5 degrees Celsius (2.5^0 C, or 4.5^0 Fahrenheit [F]) due to increased water travel time through the spillway resulting in increased insolation. Applying their predicted temperature increases to spillway water temperatures measured at 1,300 to 1,900 cfs by Reclamation (Bureau of Reclamation 2009), indicates that summer spillway water temperatures could rise to greater than 26.1^0 C (79^0 F). Hiebert and Bjornn (1980) recommended, based on their data, that summer spillway flows of 1,300 cfs (the minimum summer spillway target flows under current operations) would be the minimum that would prevent water temperature increases below the spillway of greater than 1.0^0 C (1.8^0 F), and that this flow rate would support the trout fishery below the spillway in terms of wetted habitat, water temperature, and dissolved oxygen.

The Service's analysis of actual spillway flow data (Appendix) indicates there is potential for the proposed minimum summer spillway flows of 500 cfs to occur for the entire irrigation season for several years in a row. Our analysis assumes that the powerplants were running at full capacity when sufficient water was available. This may represent a worst case scenario, since even with sufficient water, the powerplants may not always run at full capacity for various reasons. However, even with accounting for the actual amount of water directed through the powerplants real-time, our analysis indicates there remains potential for flows of 500 cfs to occur for one to two months during the hottest part of the summer, for several years in a row.

The presence, abundance, and distribution of organisms tends to be limited by the extreme conditions that occur in a given location. The potential for flows of 500 cfs to occur for at least one to two months for several years in a row, separately or combined with potential water temperature increases in the spillway pools up to or greater than 26.1^0 C (79^0 F), could be limiting to fish and wildlife resources in the spillway pools and wetlands. This would represent a loss of aquatic habitat value for these species.

Increased summer water temperatures below the spillway may have no effect on smallmouth bass, a warm-water species, that spawn in the spillway pools. The Upper Incipient Lethal Temperature (UILT) for rainbow trout ranges between 25^0 to 26.7^0 C (77^0 to 80.1^0 degrees F). Water temperatures of greater than 26.1^0 C (79^0 F) (nearly at the top range of the UILT for rainbow trout) in the spillway pools would mean that rainbow trout would likely either leave the

pools or die. This could effectively remove the spillway trout fishery for a significant portion of each summer.

Reclamation has acknowledged that the rainbow trout fishery in the spillway is important to local communities. Currently, trout enter the spillway pools via entrainment through the existing spillway. To maintain the trout fishery, Reclamation has proposed to maintain this entrainment via installing water release pipes in the new spillway at depths to draw reservoir trout through the spillway into the pools below. Entrainment would also occur at higher spillway flows when water is directed through the radial gates. If spillway water temperatures increase as predicted, entrainment could lead to consistent mortality of rainbow trout in the spillway pools under the proposed minimum flows.

The effects of high summer water temperatures combined with lower flows on listed snails in the spillway pools, particularly SRP, are unknown. The association, if any, between the presence of mat algae in snail habitat and absence of snails where mat algae occurs is unknown. Algae tend to increase with increased water temperature. Potentially higher spillway water temperatures could result in an increase in mat algal abundance and distribution in the snail pool, which is cause for concern. The known information on SRP suggests that it requires cool to cold flowing water with high dissolved oxygen content. The presence of these requirements in the spillway pools could be affected by higher water temperatures and the proposed minimum spillway flows.

Complete analysis of potential impacts to listed snails and recommendations to rectify impacts will be addressed through the ongoing ESA formal consultation process. Given that there is at least potential for changes in spillway operations to affect both listed snails and rainbow trout, and mitigation measures for snails may affect trout and vice versa, we address these species in our recommendations below.

We recommend that Reclamation continue to monitor the abundance and distribution (and reproduction) of listed snails in the pools below the spillway; and, working with IDFG, determine baseline abundance and distribution of rainbow trout below the spillway during the irrigation season, and especially during the hottest part of the summer. Reclamation agreed in Appendix E of the DEIS to determine baseline conditions below the spillway for water temperature; pH; total maximum daily load; dissolved solids; dissolved oxygen; sediment deposition and distribution; abundance, diversity, and distribution of aquatic macrophytes; and other parameters critical to wetland function. Monitoring for these parameters should be continued under the proposed spillway operations. To the above parameters, we recommend that minimum and maximum values be monitored for water temperature, pH total maximum daily load, and dissolved oxygen. If listed snails and/or trout are impacted, we recommend the following to avoid or minimize net loss of in-kind habitat value to these species:

Reclamation should actively seek to obtain and implement the authority and flexibility to adapt minimum summer spillway flows that will provide power while *maximizing* benefits that will preserve the integrity of the wetlands and pools below the spillway. Preserving the integrity of the spillway wetlands and pools means preserving conditions required to maintain listed snail habitat, and maintaining conditions that will support the trout fishery below the spillway equal to or better than under existing conditions. Exercising such flexibility could at times mean

producing less power in order to avoid or minimize impacts to listed snails and rainbow trout, but also to other aquatic and wildlife resources that use the spillway wetlands as determined in consultation with IDFG, the Service, and the Refuge. Exercising flexibility in this manner would meet the intent of the FWCA. This flexibility will be critical to allow Reclamation to respond to new conservation issues that will inevitably occur in the future.

We further recommend that this flexibility include increasing minimum summer spillway flows to a level above 500 cfs if monitoring indicates 500 cfs is impacting either or both rainbow trout and listed snails. This condition should include the following: If snail and/or trout presence, abundance, and distribution (including snail reproduction) are being impacted, but monitoring cannot definitively indicate that flows of 500 cfs are the cause, Reclamation should still commit to raising minimum flows and monitor effects on snails and trout. If parameters for these species improve, Reclamation should keep the flows at the higher level, even if this means doing so on a permanent basis. If parameters for these species do not improve, flows could be decreased back to 500 cfs. In either case, monitoring should continue to try to determine conditions impacting listed snails or rainbow trout. In stating the above, we acknowledge that maintaining conditions to avoid or minimize impacts to listed snails would take priority, but that if listed snails are not impacted by implementing flows that will maintain the trout fishery, then flows should be maintained that will support the trout fishery.

If Reclamation is unable to secure and implement the authority and flexibility to adapt minimum summer spillway flows to avoid or minimize impacts to the spillway trout fishery, we recommend that Reclamation commit to mitigating loss of the spillway trout fishery in consultation with IDFG by some means acceptable to them.

Mitigation measures adopted for varying species and habitats as described above may result in benefits to some species and impacts to others. If this occurs, we expect that Reclamation will resolve such issues through consultation with IDFG, the Refuge, and the Service.

Fish Entrainment, North Side and South Side Canals

The construction of the Minidoka Dam, completed in 1906, resulted in losses of fish and wildlife habitat. Pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 and the subsequent Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program (CRBFWP), a wildlife impact assessment and mitigation plan were developed for the Minidoka Dam (Martin and Meuleman 1989, Meuleman et al. 1991). About 49 percent of identified wildlife habitat losses (habitat units) have been mitigated. However, there has been no mitigation for loss of fisheries, and no mitigation for operational impacts on fish or wildlife (Servheen pers. comm. 2010), as defined by the CRBFWP. IDFG estimated that fish habitat lost since inundation behind Minidoka Dam in 1906 has resulted in accrued losses of approximately 86,658 Yellowstone cutthroat trout and 21,724,292 mountain whitefish through 2007 (IDFG 2007). (Yellowstone cutthroat trout may still occur above Minidoka reservoir and occasionally enter Lake Walcott, probably entrained through American Falls Dam but they are not known to reproduce in the reaches inundated by the dam.) IDFG considers these as conservative estimates.

Lake Walcott is now habitat for a different suite of species. Introduction of non-endemic species into Lake Walcott such as rainbow trout, white sturgeon (rainbow trout and white sturgeon are native to the Snake River, but not endemic above Shoshone Falls, downstream of Minidoka Dam), and smallmouth bass could be considered as partial out-of-kind replacement for species and numbers lost under the FWCA (but not necessarily under the CRBFWP). However, losses of these species to entrainment in the North Side and South Side canals represent continued unmitigated losses of this out-of-kind replacement. IDFG states that most fish entrained are rainbow trout, and occasionally white sturgeon (Megargle pers. comm. 2010). Most entrained white sturgeon are trapped and returned to the river above the dam. Loss of some percentage these species in the canals represent a cost to the state of Idaho, since they are replaced from hatchery stocks. In addition, trout and other fishes entrained in the canals represent prey that has become largely unavailable to fish-eating birds that forage in the reservoir and the spillway.

Reclamation's proposed headworks replacement on the North Side and South Side canals does not include installation of barriers to minimize or prevent fish entrainment into the canals. However, Chapter 9 of Title 36 of the Idaho Code provides that canals and diversions in the state of Idaho shall not be operated without a screen or other suitable device in place to prevent fish from entering canals or diversions.

The Service recognizes that designing and installing fish barriers as part of replacing headworks for the canals would significantly increase the cost of the project. Additionally, once installed, fish barriers usually entail annual maintenance costs. However, the FWCA states that fish and wildlife conservation measures that are adopted should be considered an integral part of project costs, including measures that modify a project and/or project operations. It would be appropriate to request an additional appropriation of funds to cover adoption and installation of fish barriers as a conservation measure. We recommend that Reclamation include the following in the EIS to ensure a full and adequate evaluation occurs for anticipated impacts:

- The new headworks will likely remain functional for at least as long as the existing headworks, i.e., at least a century, so an opportunity to include fish barriers as part of new headworks will not occur again for a very long time.
- Once the new headworks are installed, retro-fitting them post-construction with fish barriers would likely incur higher costs than if barriers are installed as part of the proposed project. This higher cost would likely decrease the probability of installing fish barriers in the future, and the current unmitigated loss of fish resources would continue.
- Without an alternatives analysis, including analyses of types of barriers suitable to these conditions and their costs, a viable plan for soliciting funding to include barriers as part of the current project cannot be formed. Funding sources could include the state of Idaho, irrigation districts, congress, NGOs, and other partners.
- The canals will be operated in violation of the Idaho Code as long as the canals remain without fish barriers, and unmitigated loss of fish resources would continue, counter to the intent of the FWCA and the CRBFWP.

Based on the above discussion, the Service strongly recommends that Reclamation include a third action alternative in the EIS, such that fish barriers are designed into the proposed headworks for the North Side and South Side canals. Doing so would present a full range of

alternatives in the EIS, ranging from spillway replacement without canal headworks replacement; spillway replacement with canal headworks replacement; and spillway replacement with canal headworks replacement to include fish barrier installation. We expect that analysis of the effects of this third alternative would be based on consultation with IDFG, the Service, and the Refuge, and would include (but not be limited to) a discussion of costs and benefits to: fish and other species; IDFG for replacing fish; recreational opportunities; and building and maintaining the barriers. In addition, we recommend that the No Action Alternative include a more in depth analysis than contained in the project Draft Environmental Impact Statement of the impacts to fish and other species, IDFG's long term costs, and recreational opportunities foregone, without fish barriers in place.

Adaptive Management and Technical Team

The potential for impacts to many natural resources resulting from operational changes proposed in this project are largely unknown as should be clear from our discussions above. Reclamation's commitment to the adaptive management process and its ability to develop specific adaptive management strategies will be critical to its ability to respond to the natural resource issues discussed here, to the Service's comments to the draft EIS (DEIS) under the authority of the NEPA, and to new conservation concerns that will inevitably rise.

Reclamation agreed in Appendix E of the DEIS to work with the Service, IDFG, and the Refuge to develop project adaptive management strategies, ". . . within authorized reservoir operations, state water law, repayment contracts, flow augmentation commitments, Biological Opinion (Bi-OP) requirements, and within the proposed flows through the water release gates working capacity. These actions are dependent upon funding." This agreement was in response to the Service's recommendation regarding adaptive management, presented in our Draft Fish and Wildlife Planning Aid Memorandum, submitted for this Project on October 14, 2009.

The Service recommends, however, that Reclamation be more specific in describing and committing to adaptive management strategies. Adaptive management strategies and any subsequent response actions that are dependent on "future funding" cannot be viewed by the Service as a commitment; without a stronger commitment, it is unclear whether Reclamation can truly respond to resource concerns in a manner that is consistent with the intent of the FWCA. We also recommend that specific management strategies be attached to monitoring in order to minimize or mitigate impacts, i.e., if condition 'X' exists, then management action 'Y' will take place to minimize or mitigate identified impacts. This specificity would apply to known conservation issues discussed in this letter and in the DEIS. New conservation issues that arise would of course require some form of monitoring, after which management actions would be devised to deal with conditions identified through monitoring.

Close coordination with IDFG, the Service, and the Refuge would be required to develop efficient and efficacious monitoring protocols and associated management strategies. The Service recommends that if adaptive management is included as a management tool, then a Technical Team should be developed to carry through with adaptive management decisions. Such a team should include at a minimum personnel from Reclamation, IDFG, the Service, and the Refuge. Representation should probably also be sought from the Army Corps of Engineers,

the Idaho Department of Water Resources, and the Idaho Department of Environmental Quality. Willing cooperation may be more easily secured from all parties if Reclamation would commit to be bound by consensus agreements reached by the team, provided such agreements would not violate or be inconsistent with existing legal authorities or commitments under which Reclamation operates.

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APPENDIX

Minidoka Dam Spillway Flow Rates (cubic feet per second [cfs]) for Years 1997 through 2008 with Maximum Inman Powerplant Capacity of 8,600 cfs Subtracted Out: Table and Graphs

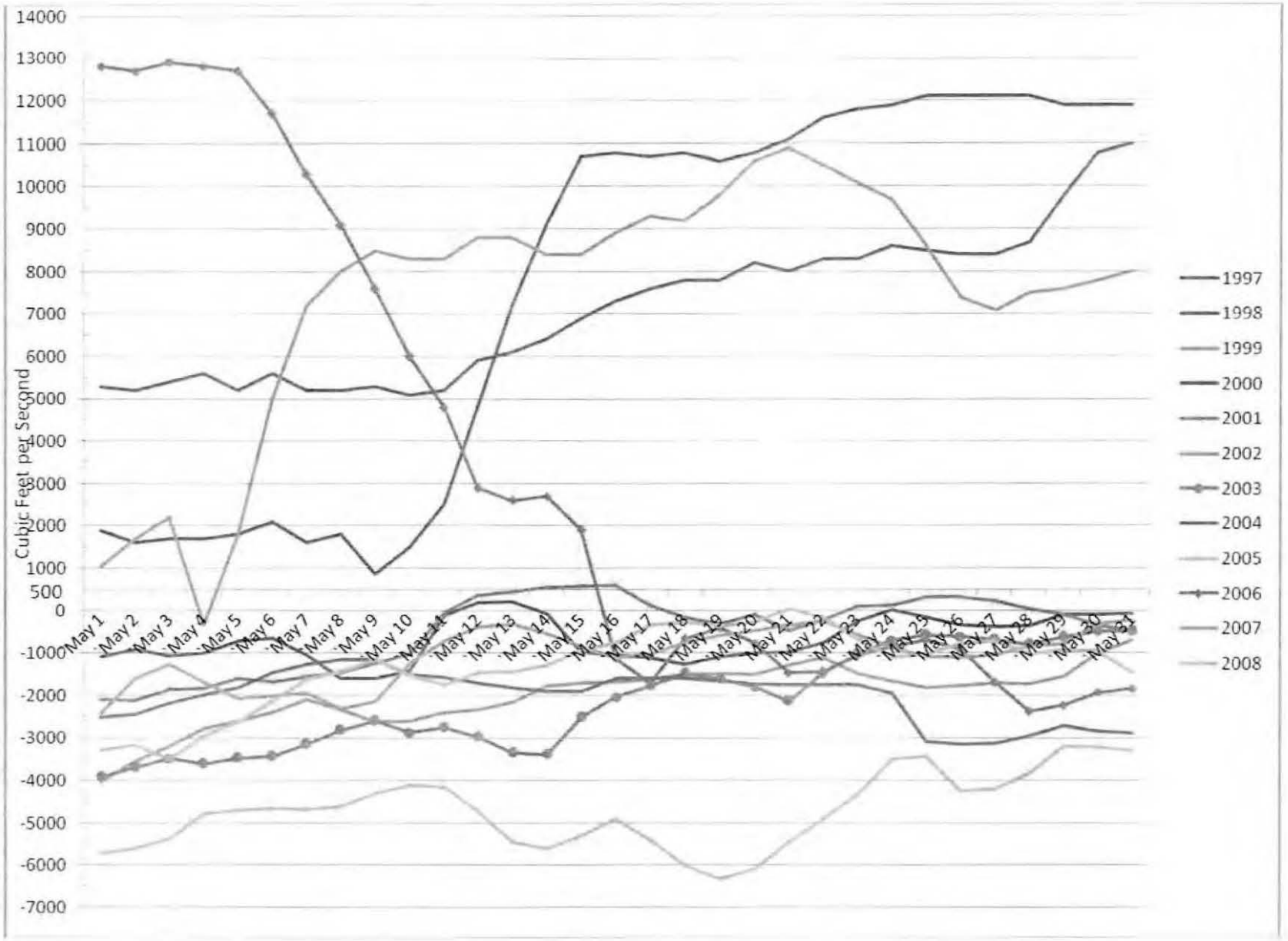
Years per month in which spillway flow rates would have been at 500 cfs, using data from USGS gage at Howell's Ferry for years 1997-2008 (12 years). See following graphs.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
April					X	X	X	X	X	Z (18 days)	X	X
May				X	Z (26 days)	X	X	X	X	X	X	X
June					X	X	X	X	X	X		
July					X	X	X	X				
August					X	X	X	X	Z (26 days)		Z (26 days)	
September		Z (21 days)	X	X	X	X	X	X	X	X	X	X
October		X	X	X	X	X	X	X	X	X	X	X

X = Spillway flows at 500 cfs for entire month.

Z = Spillway flows at 500 cfs for > 15 days per month.

Blue = spillway flows > 500 cfs.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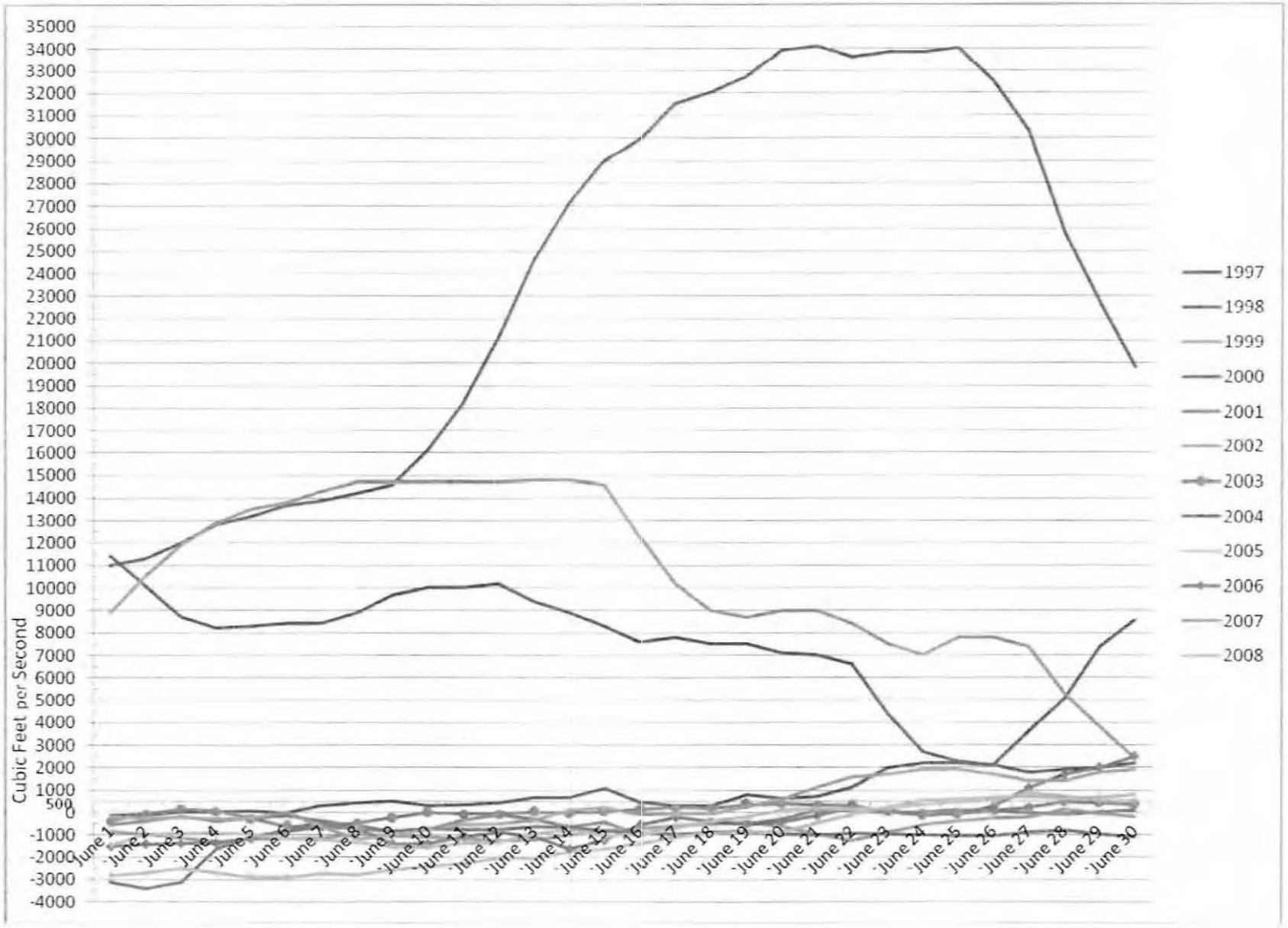
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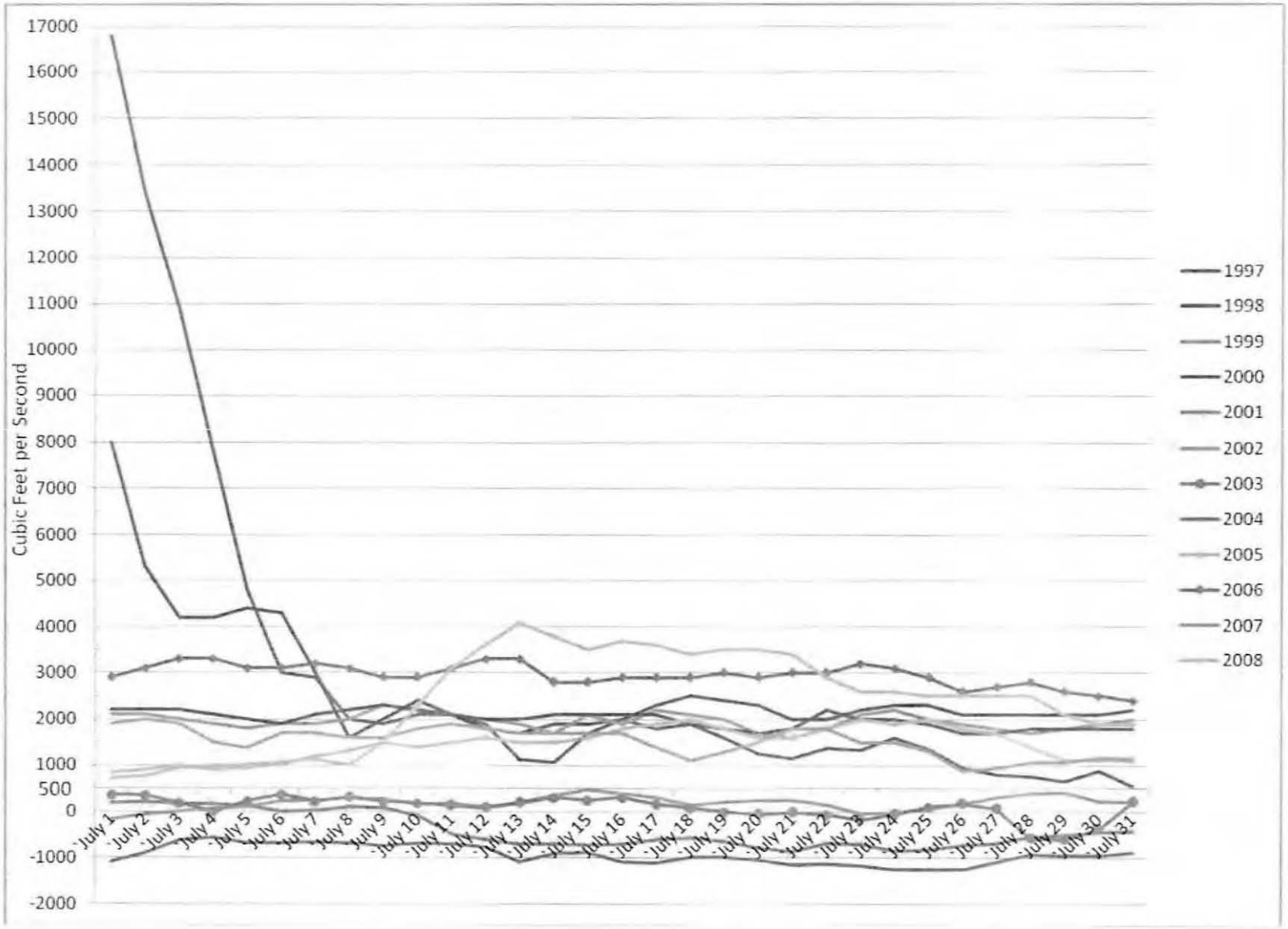
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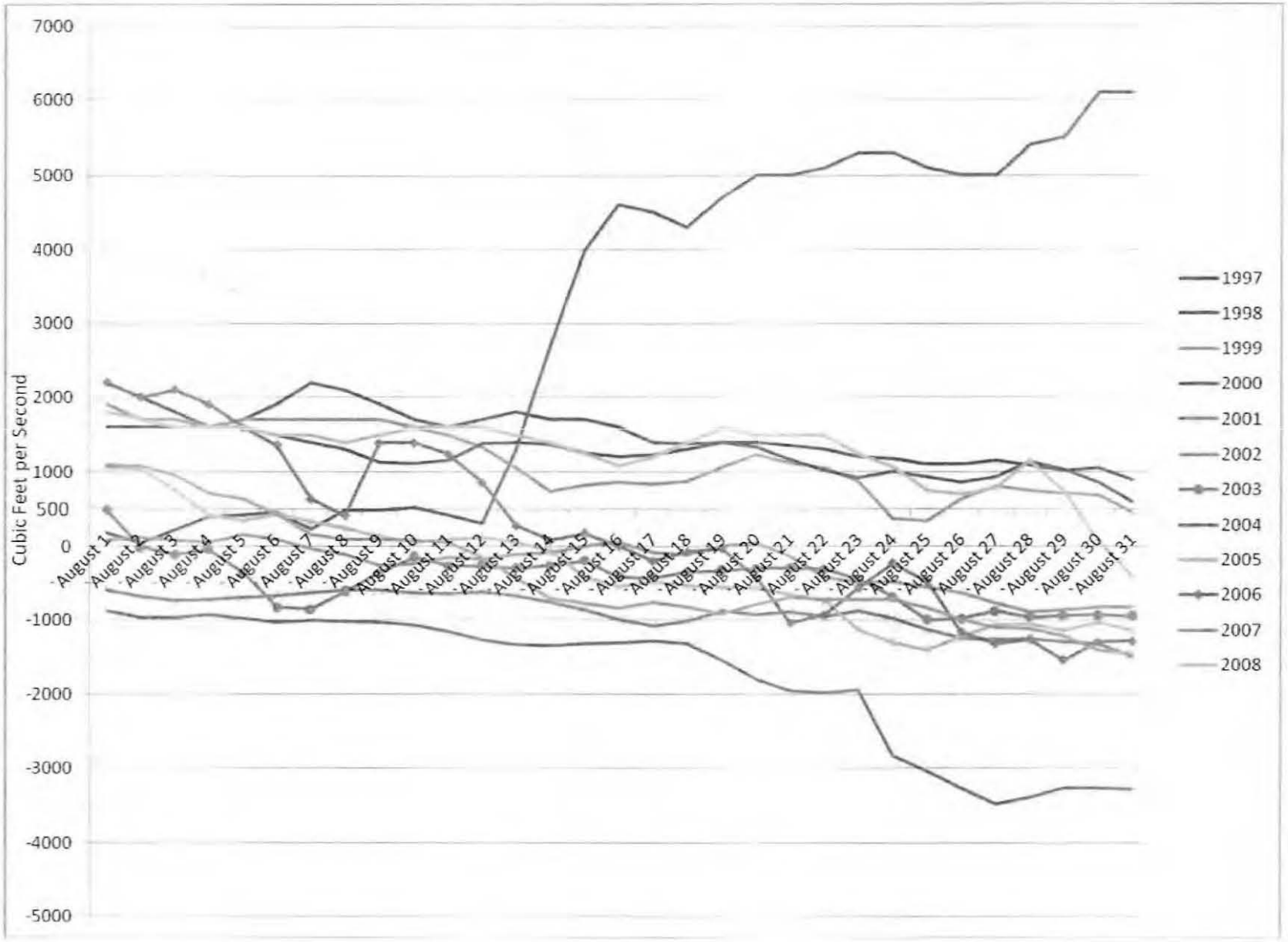
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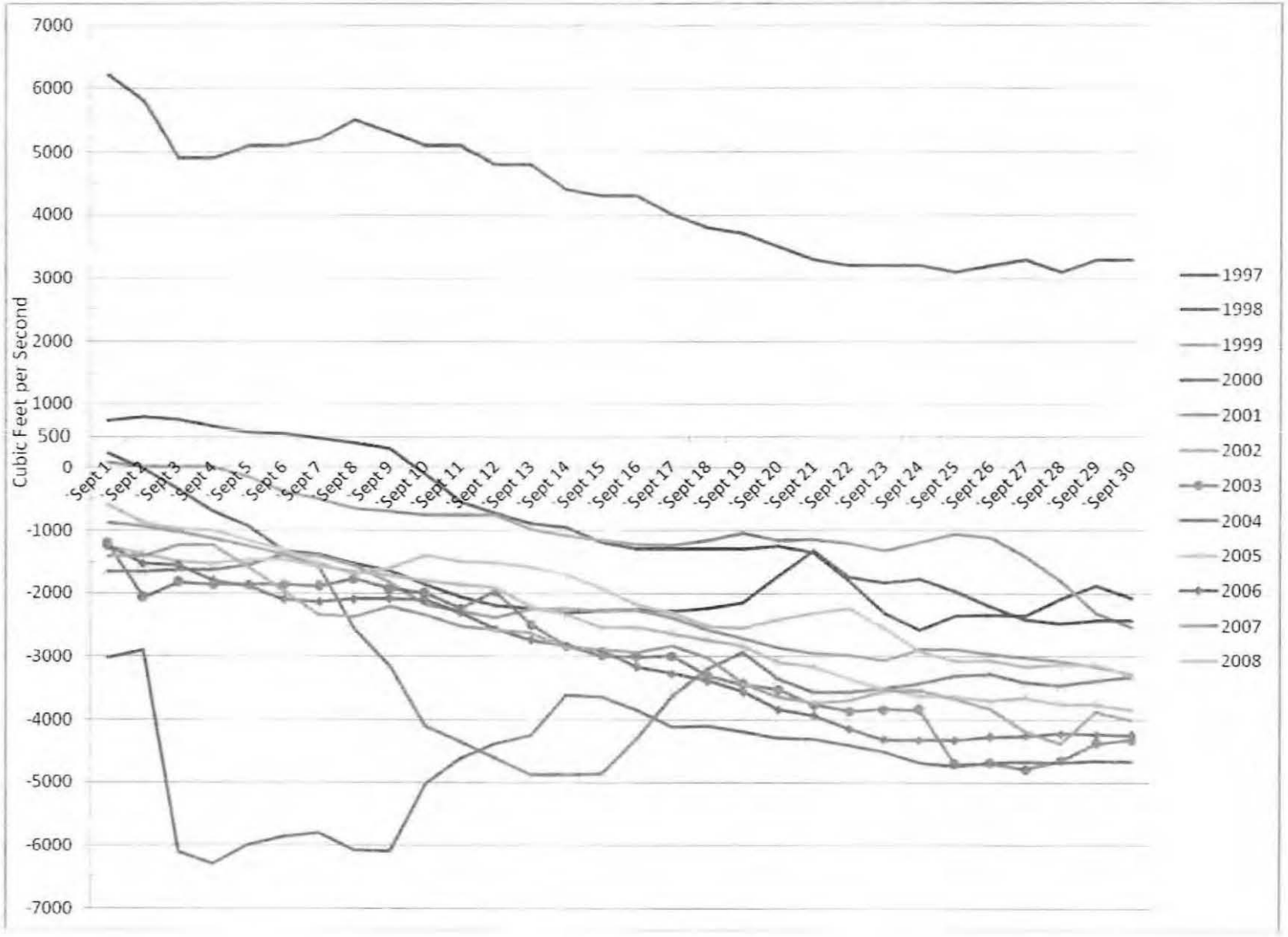
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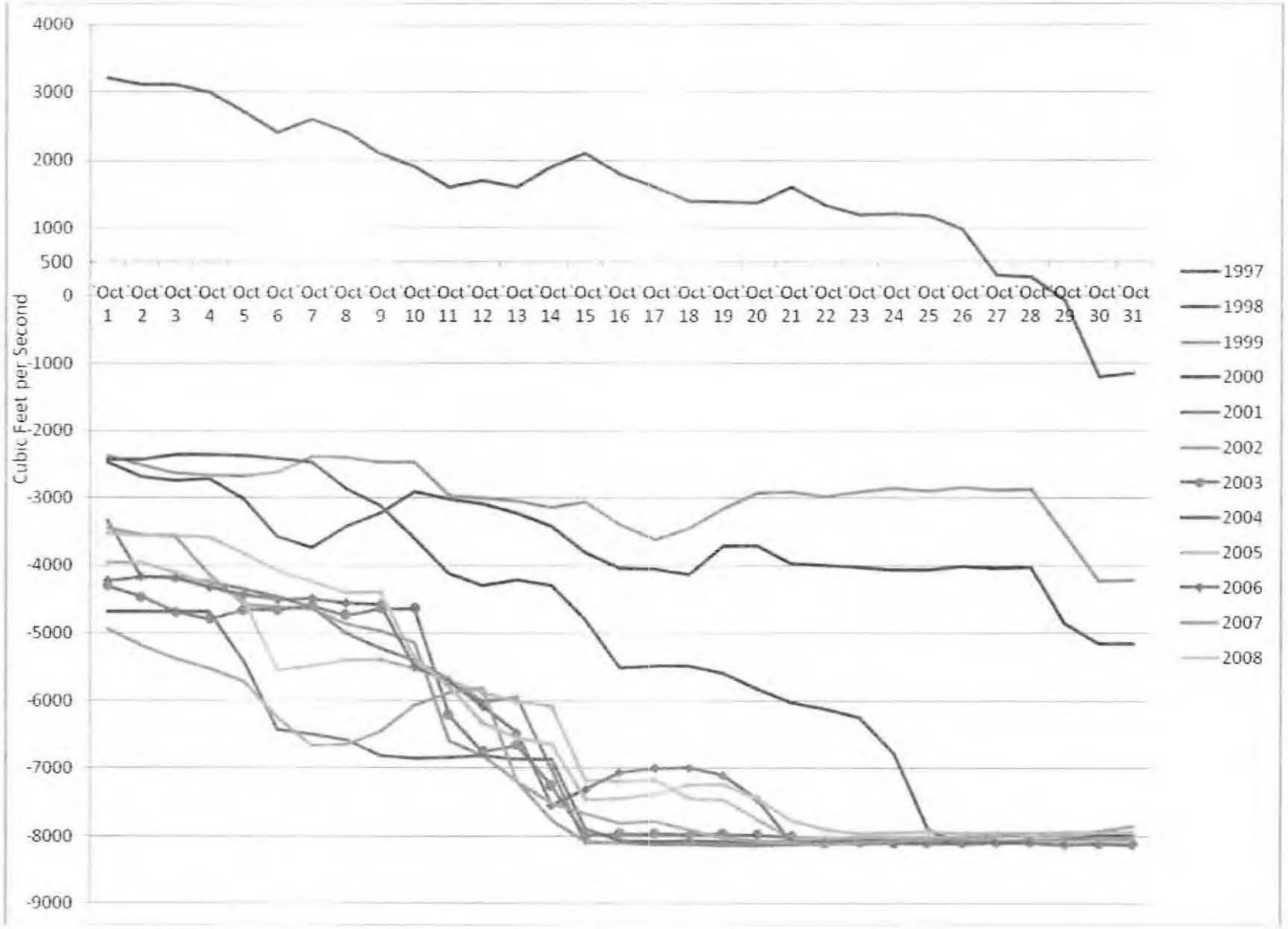
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Appendix F Environmental Commitments

The following mitigations actions are considered to be commitments being made by Reclamation. In addition, the recommendations provided in the FWCA Report which Reclamation agreed, are also considered commitments. Furthermore, possible impacts of reducing spillway flows during irrigation season from 1,900 cfs to 500 cfs have been identified in the Final EIS. However, additional impacts may be identified when monitoring is done under the adaptive management approach. Reclamation commits to do supplemental NEPA evaluation if there are impacts that have not been identified and addressed in the Final EIS.

Coordination Act Report Recommendations Agreed to by Reclamation

Reclamation has included an adaptive management approach to reservoir operations for each action alternative, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.

Reclamation intends to monitor the response of muskrats and beavers using the USFWS refuge's data sources. Cottonwood trees may need to be protected with fencing. Willow and cattail species should not be significantly affected by a slight increase in muskrat and beaver populations.

Reclamation will utilize, and modify if needed, its current invasive species management program to monitor for increased invasive species establishment as may be influenced by this project. With the revised operations as described in Section 2.3.8 Operations, Reclamation has retained the flexibility, if needed, to adjust operations to help control, or deter establishment of, invasive species.

Reclamation currently monitors ESA-listed snails in the project area and will continue to do so.

The Technical Team will assist in determining the appropriate minimum flow in the spillway. Rather than immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and assistance from the Technical Team, Reclamation will adjust operations accordingly to avoid impacts, or provide mitigation if required.

A monitoring program will be established, with assistance from the Technical Team, to address the spillway trout fishery as well as spillway and reservoir impacts to other fish and wildlife species.

Hydrology Reservoir and Spillway Operations

With the new spillway structure, Reclamation will have the physical flexibility to adjust the reservoir water surface throughout its full range of operational elevations as conditions warrant. Consequently, Reclamation generally intends to maintain Lake Walcott at its full operational elevation of 4245.0 feet throughout the year. However, in 25 to 50 percent of years, it is expected that irrigation demand, facility maintenance needs and environmental concerns will require that the reservoir be drafted to elevation 4240.0 feet during the winter months.

Under Alternatives B and C, Reclamation is proposing to reduce irrigation-season spillway flows from the current 1,300 to 1,900 cfs flow range down to a minimum flow of 500 cfs. However, Reclamation recognizes the potential that impacts may occur to some natural resources at spillway flows between 500 and 1,300 cfs. Consequently, Reclamation proposes to establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. In addition, in each action alternative, instead of immediately implementing a minimum spillway flow of 500 cfs, Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and in consultation with the Technical Team, Reclamation will, within Reclamation's operational flexibility, adjust operations to avoid impacts, or provide mitigation.

Groundwater

Due to a potential increase of seepage from the sand layer downstream of the North Side Canal, slope stabilization or drainage mitigation may be required. Mitigation would depend on the location of any new seepage. If the new seepage can be captured by existing measurement devices (flumes), then no mitigation would be necessary. However, if additional subsurface seepage daylights in new areas, channelization or installation of new measurement devices might be required.

Water Quality

On-site actions are incorporated or required under several water quality permitting and certification processes. These include CWA Section 404 dredge and fill permits issued by the Corps, Section 401 water quality certification by the State of Idaho, and stormwater discharge National Pollution Discharge Elimination System (NPDES) permit issued by EPA. Other activities that are incorporated into Alternatives B and C include the use of the existing spillway and headworks as bulkheads or cofferdams during construction.

Reclamation is recommending an adaptive management approach to minimum summer time spillway discharge. Temperature and other water quality parameters will be measured in response to ramping summer time spillway discharges down during the 4-year period. Should temperature increases occur that would impact the biological communities of the spillway area, Reclamation will adopt a higher minimum spillway discharge up to 1,900 cfs.

Aquatic Biota

Reclamation requires that contractors comply with the following mitigation requirements:

Construction Practices

1. Use appropriate construction methods to isolate in-channel construction areas from flowing water to minimize turbidity and sediment released from site.
2. Insure that petroleum products, chemicals, or other harmful materials are not allowed to enter the water.
3. Perform as much machine work as possible from the streambanks to minimize disturbance to the streambed.
4. Minimize disturbance to riparian vegetation.
5. Restore the site to near-original conditions/grade. Remove spoils from the construction area when it is not possible to shape them to near-original conditions.
6. Dispose of construction spoils and waste materials at proper sites away from the stream channel.
7. Use silt screens to minimize the overland flow of fine sediments from construction sites into the stream during precipitation events.
8. Capture game fish that are inadvertently trapped in sections of ditch or river isolated for construction, and liberate them into adjacent flowing water.
9. Obtain all required Federal, State, and local permits.
10. Enumerate game fish incidentally killed during blasting operations and replace in kind after construction is completed.

Site Recovery

1. Stabilize disturbed upland, riparian and wetland areas with native grasses and vegetation.
2. Vacate construction sites leaving a positive visual impact blending with the natural landscape.

Terrestrial Biota

Reclamation will adopt an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.

Mitigation measures for the following species will be addressed for this project:

Western and Clark's Grebes: Effects of the new operation on emergent vegetation should be monitored according to published or approved scientific research protocol to determine impacts to these species. If it is determined that the species is being impacted, appropriate mitigation measures will be considered.

Great Blue Heron: The proposed operation would allow higher winter water levels, which would favor increased beaver population. Since beavers like to eat cottonwood bark, the grove of cottonwoods that supports the great blue heron colony will be protected with wire to prevent girdling by beavers after construction.

Franklin's Gull: There should be no effect on the birds from construction or operation if new flow through the dam does not affect the caddisfly population. The caddis hatch may need to be monitored according to published or approved scientific research protocol to determine affects to the gull's food source. If it is determined that the species is being impacted, appropriate mitigation measures will be considered.

Trumpeter Swan: There should be no effect on the trumpeter swan from construction or proposed operations. The emergent vegetation may need to be monitored according to published or approved scientific research protocol to determine if the proposed operations will affect trumpeter swans. If it is determined that the species is being impacted, appropriate mitigation measures will be considered.

Bald Eagle: The proposed operation would allow higher winter water levels, which would favor increased beaver population. Beavers like to eat cottonwood bark, and since there is only one tall tree suitable for nesting on one of the islands on the reservoir, it will be protected from beavers with wire.

Mammalian Communities

Recent attempts to increase the number of cottonwoods by planting cuttings failed, primarily because of beaver predation on the cuttings before they could root. Existing trees will be protected with wire as discussed above.

Wetlands

Due to spillway operational changes, Reclamation will complete a functional assessment prior to completion of construction to establish a baseline for adaptive management monitoring. A monitoring plan will be developed with the assistance of the Technical Team, which includes the establishment of impact thresholds, and if it is concluded that negative impacts occur to the wetland habitats, the spillway flows will be increased appropriately to protect the impacted wetland habitat.

Reclamation will mitigate on a one-to-one basis for wetland losses due to construction activities. After completing a wetlands delineation and functional assessment, a total of 3 acres of appropriate functioning wetland will be constructed on the southwest edge of the spillway.

The site of mitigation for these wetland habitats would be located on the southwest edge of the spillway (Appendix B – Figure 2-6). This area currently supports a vegetative community of predominately sagebrush and cheatgrass. Immediately northwest of this area (Appendix B – Figure 2-6) , in a solid stand of cheatgrass, appropriate native plants (including sagebrush) would be planted on a one-to-one basis to replace the lost sagebrush community in the wetland mitigation area.

Additionally, the extent of aquatic macrophytes and species composition of those stands along the littoral zone of the reservoir (which serves critical habitat functions for both fish as well as wildlife species) will be monitored.

Threatened and Endangered Species

Under Alternative B, Reclamation is proposing to reduce irrigation-season spillway flows from the current 1,300 to 1,900 cfs flow range incrementally, over a 4-year period, down to a fixed target flow as low as 500 cfs. The new spillway flow would be established based on flow requirements of the two ESA-listed snails known to occur within the spillway area and impacts to other resources. This flow would be determined by Reclamation managers with input from the Technical Team. The proposed adaptive management approach to establishing spillway flows is intended to reduce irrigation-season spillway flows without having a negative effect on ESA-listed species known to occur within the spillway area. In addition, the new structure would likely reduce or eliminate structural leakage and potentially alter subsurface seepage as currently exists. If it is determined through monitoring that this condition negatively affects ESA-listed snails, Reclamation is proposing to provide non-irrigation season flows up to 100 cfs as mitigation for the potential reduction or elimination of the existing subsurface seepage. This mitigation would result in year-round flows through the spillway area for ESA-listed snails.

Under each action alternative, construction activities would be conducted upstream of the spillway pool containing ESA-listed snails. Reclamation is proposing to maintain flows to the pool containing ESA-listed snails throughout the duration of the construction project consistent with current operations. Further, Reclamation is proposing to require contractors to implement standard BMPs so as to ensure construction materials do not enter the pool containing ESA-listed snails. Table F-1 summarizes mitigation measures for each alternative.

Table F-1. Mitigation measures for No Action and action alternatives.

Spillway		
Alternatives	**Action**	**Associated Mitigation**
A – No Action	None	None
B – Spillway and Headworks Replacement	Reduce spillway flows, reduce or eliminate structural leakage. Potential alteration of subsurface seepage rates.	Reclamation would implement a 4-year flow-reduction schedule to be monitored by a Technical Team. The determined flow would be sufficient to maintain the ESA-listed snails. Reclamation would also provide over-winter flows through the spillway area if needed.
C – Spillway Replacement	Reduce spillway flows, reduce or eliminate structural leakage. Potential alteration of subsurface seepage rates.	Reclamation would implement a 4-year flow-reduction schedule to be monitored by a Technical Team. The determined flow would be sufficient to maintain the ESA-listed snails. Reclamation would also provide over-winter flows through the spillway area if needed.
Reservoir (Lake Walcott)		
Alternatives	**Action**	**Associated Mitigation**
A – No Action	None	None
B – Spillway and Headworks Replacement	Earlier pre-irrigation season fill	None
C – Spillway Replacement	Earlier pre-irrigation season fill	None
Construction		
Alternatives	**Action**	**Associated Mitigation**
A – No Action	None	None
B – Spillway and Headworks Replacement	Work above snail pool	Implement BMPs; maintain flows consistent with current operations
C – Spillway Replacement	Work above snail pool	Implement BMPs; maintain flows consistent with current operations

Per Reclamation's standard construction contract requirements, sediment and spill control structures would be required at all locations along the new spillway where construction activities have the potential to contact or reach wetted channels.

Reclamation personnel would routinely monitor construction activities to ensure flows are sustained though the south channel and that contract requirements are fulfilled.

Geology, Soils, and Flood Plain

Following the abandonment of the staging and waste areas after construction of Alternative B some reclamation effort would be necessary to prevent wind erosion of soil and permit revegetation. Heavily-compacted areas of soil may require scarifying the ground to break up the surface prior to reseeding with natural vegetation.

Excavation of canal and road embankments may generate reusable fill materials. Some stockpiling of the fill material is anticipated. High winds could produce dust that would call for dust abatement procedures through the construction period. The piles of unconsolidated fill may need to be covered or kept damp.

Cultural Resources

Archaeological Resources

No mitigation would be necessary under any of the alternatives. Mitigation for adverse effects resulting from future Reclamation undertakings at Minidoka Dam will be addressed on a case by case basis through Section 106 consultation.

Historical Resources

Alternative A – No Action

No mitigation will be required under the No Action alternative. Mitigation for adverse effects resulting from future Reclamation undertakings at Minidoka Dam will be addressed on a case-by-case basis through Section 106 consultation.

Alternative B – Spillway and Headworks Replacement

Consultation pursuant to the 36 CFR 800 regulations has been initiated with the Idaho SHPO over effects of the spillway replacement on the historic features of Minidoka Dam. Reclamation and the SHPO concur that the undertaking, as proposed under Alternative B, would have direct and indirect adverse effects on the Minidoka Dam historic site, requiring specific action by Reclamation to mitigate those effects. The mitigation measures enumerated below have been developed by Reclamation in coordination with the SHPO. These measures

would be formalized in a Memorandum of Agreement (MOA) between Reclamation and the SHPO. The National Advisory Council on Historic Preservation has chosen not to participate in the development of the MOA.

Reclamation agrees to perform the following actions to mitigate the adverse effects of the proposed project to the Minidoka Dam historic property:

1. Prepare large-format (4 X 5) black and white contact prints, archival processed, of the historic bridge that crosses the North Side Canal, early 20th century concrete lining and Civilian Conservation Corps (CCC) period lining along the North Side Canal, and close-up views of existing spillway piers and bays and action views of the process of pulling and placing stoplogs;
2. Create a publically accessible informational display near Minidoka Dam (possibly in the State Park), using salvaged sections of piers, bays, stoplogs, walkway, and ogee, removed from the original spillway, if possible. The display will inform visitors about the history, construction, and function of the overflow spillway being replaced. Blueprint drawings, historic photographs, and narrative text will supplement the spillway display;
3. Retain, as agency museum property, the traditional hand tools used in the process of manually pulling and placing stoplogs.

Alternative C – Spillway Replacement

Same as Alternative B, except that large-format prints of the historic North Side Canal bridge and North Side Canal lining would not be necessary. These features will remain unaltered under Alternative C.

Sacred Sites

If sacred sites are located within the reservoir and are exposed during drawdown, the tribes would be notified immediately.

Recreation

During construction, signs may be posted with maps showing the availability of recreation opportunity alternatives outside the construction zone.

Noise

Section 24 of Reclamation's Safety and Health Standards (RSHS) provides general requirements for blasting operations. Section 24.1.8 Vibration and Damage Control requires precautions be taken to minimize earth vibration, air blast, and thrown fragments. Where

vibration and blast damage is possible, a vibration and damage control section is to be included in the site blasting plan. A method of accurately measuring and documenting earth vibration and effects on nearby facilities or structures are to be established. The maximum peak particle velocity as recorded at the designated structure or location must not exceed 1 inch per second. The airblast is to be controlled so that it does not exceed 128 decibel linear-peak at designated locations or structures.

In addition to the items required by RSHS Section 24.1.3, the Blasting Plan will include the following measures to assure those in the area of Minidoka Dam are aware of the blasting operations and the peak limits for blasting are not exceeded:

- Notification of the date and time of blasting will be provided no less than 10 days in advance of commencing any blasting work to nearby residents, local law enforcement, newspapers, and sensitive receptors located within 1,000 feet of blasting including the refuge and park.
- Pre-blast alarms will be sounded. Immediately before blasting, the construction contractor will be required to sound a signal announcing the blast. Construction contractors will follow the construction safety plan that will provide for these measures.
- Best available practices will be employed to limit airblast from blasting to 128 dB and vibration to less than 1 inch per second at the nearest noise sensitive land uses.
- Noise and vibration monitoring will be performed at nearby residences and sensitive receptors to ensure that airblast from blasting is limited to 128 dB and that vibration is limited to less than the 1 inch per second criteria.

Air Quality

DEQ requires air quality permits for the operation of portable rock crushers and concrete/asphalt batch plants and prescribes specific BMPs. DEQ also requires the use of specific BMPs to control fugitive dust at all construction sites (IDAPA 58.01.01.650-651) (DEQ 2008b). Other short-term emissions from construction sites are exempt from air quality permitting requirements. DEQ also requires the use of specific BMPs to control fugitive dust (IDAPA 58.01.01.650-651) (DEQ 2008b).

Construction hours will likely range from 8 to 12 hours per day, 5 days per week; 24/7 work days are not anticipated.

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Appendix G Tribal Correspondence

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SRA-1104
ENV-6.00

«AddressBlock»

Subject: Intent to complete and Environmental Impact Statement for Minidoka Dam Spillway

«GreetingLine»

Pursuant to section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969: as amended, the Bureau of Reclamation intends to prepare an Environmental Impact Statement (EIS) on the proposed Minidoka Dam Spillway Replacement. Alternatives currently being considered are: No Action as required under NEPA, total replacement of the spillway and headgate structures, or replacement of just the spillway. Reclamation would like to request a special public meeting with the «Address_Line_1» to receive comments specific to tribal interests.

The purpose of the proposed spillway replacement action is to prevent a structural failure of the Minidoka Dam spillway and associated structures. The concrete that forms the spillway crest and the piers of the pier-and-stoplog structure shows extensive visible deterioration at numerous locations. In addition, the potential for ice damage to the stoplog piers requires that reservoir water levels be dropped each winter. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen along the spillway. The current conditions of the Minidoka Dam spillway and headgate structures present increasingly difficult reliability and maintenance problems. If structural problems are not corrected there is potential of partial or complete failure.

Minidoka Dam impounds Lake Walcott and is a feature of Reclamation's Minidoka Project. They are located on the main stem Snake River about 18 miles northeast of the city of Burley, and within the Minidoka Wildlife Refuge. After over 103 years of continued use, the over 2,000 foot long concrete spillway at the Minidoka Dam has reached the end of its functional lifespan. If the failures at the spillway occur, Reclamation may not be able to meet contractual obligations for water delivery, power generation, and Reclamation's commitments to deliver flow augmentation water under the Nez Perce Settlement Agreement and the Endangered Species Act.

Reclamation is requesting early tribal comment before requesting public and agency input. This information from the tribes will help to identify significant issues or other alternatives to be addressed in the EIS. Information obtained during the scoping period will help in developing information to be included in the EIS.

A draft EIS is expected to be provided for review by winter 2009 followed by opportunities to provide written and oral comments. The final EIS is scheduled for completion in winter 2010. A Record of Decision describing which alternative is selected for implementation and the rationale for its selection would then be issued following a 30 day waiting period.

Regular Public Scoping meetings will be held on the following dates and times:

- December 3, 2008 in Idaho Falls, ID: Open House Meeting 6:00 p.m. to 9:00 p.m. at the Red Lion Hotel, 475 River Park Way, Idaho Falls, ID 83402

- December 4, 2008 in Burley, ID: Open House Meeting 6:00 p.m. to 9:00 p.m. at the Burley Best Western Inn, 800 North Overland Avenue, Burley, ID 83318

Written comments will be accepted through December 19, 2008 for inclusion in the scoping summary document. Please direct requests for sign language interpretation for the hearing impaired or other auxiliary aids, to Ms. Allyn Meuleman by November 24, 2008, at 230 Collins Road, Boise, ID 83702-4520, 208-383-2258 or **Minidoka Dam eis@pn.usbr.gov.** Information on this project can also be found at: http://www.usbr.gov/pn/programs/eis/minidokadam/index.html

An additional public meeting is requested between the «Address_Line_1» and Reclamation to collect input and comments that pertain to issues important to the tribes. If you have any questions, please contact Ms. Teneal Jensen, Native American Affairs Coordinator, at 208-383-2252 or tjensen@pn.usbr.gov.

Sincerely,

Jerrold D. Gregg
Area Manager

cc: See next page.

cc: Continued from previous page.

Mr. Nathan Small
Vice-Chairman
Shoshone-Bannock Tribes
P.O. Box 306
Fort Hall, ID 83203-0306

Mr. Pete Broncho
Secretary
Shoshone-Bannock Tribes
P.O. Box 306
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Mr. Glenn Fisher
Sergeant at Arms
Shoshone-Bannock Tribes
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Mr. Adam Hill
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Mr. LeeJuan Tyler
Member
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Mr. Blaine Edmo
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707 N. Main Street
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bc: PN-3824 (Tiedeman)
SRA-2000 (Ketchum), SRA-6300 (Boyer), SRA-1206 (Mueleman), SRA-1104 (Jensen)

WBR:TJensen:cwh:10/31/08:208-383-2252:SRA-1104
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Honorable Bruce Parry
Chairman
Northwestern Shoshone Tribe
707 N. Main Street
Brigham City, UT 84302

SRA-1104
ENV-6.00

«AddressBlock»

Subject: Additional Information That Will go Out to the Public November 7, 2008, concerning the Minidoka Spillway Environmental Impact Statement (EIS).

«GreetingLine»

A pre-scoping letter was sent to the «Address_Line_1» on October 31, 2008, regarding Reclamation's intent to complete an EIS for the Minidoka Dam Spillway replacement. The purpose of the proposed spillway replacement action is to prevent a structural failure of the Minidoka Dam Spillway and associated structures.

The enclosed scoping package is being mailed to the public It includes a letter of intent, a comment form, environmental compliance document, and a National Environmental Policy Act (NEPA) process chart.

In addition to providing you with the public scoping package, Reclamation is requesting a special meeting with Tribal resources and a public meeting with the Tribes. These meetings can be set up on the reservation or a location that is most convenient for the Tribes. Please contact Ms. Teneal Jensen, Native American Affairs Coordinator, at 208-383-2252 or tjensen@pn.usbr.gov at your earliest convenience to schedule this meeting or if you have any further questions about the project or the public scoping process.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosures – 4

cc: See next page.

cc: Continued from previous page.

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SRA-1104 (Jensen), SRA-1206 (Mueleman), SRA-2000 (Ketchum), SRA-6300 (Boyer)

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United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Honorable Bruce Parry
Chairman
Northwestern Shoshone Tribe
707 N. Main Street
Brigham City, UT 84302

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Dear Chairman:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

Alternatives considered in the Draft EIS are Alternative A - No Action, as required under the National Environmental Policy Act; Alternative B - Spillway and Headworks Replacement (preferred alternative); and Alternative C - Spillway Replacement. Designation of Special Use Areas is included in both Alternatives B and C.

Oral comments may be presented at one of three public meetings on the dates and locations listed below:

Date and Time: January 12, 2010: 7:00 p.m. to 9:00 p.m.
Location: Red Lion Inn, 475 River Parkway, Idaho Falls, ID 83402

Date and Time: January 13, 2010: 7:00 p.m. to 9:00 p.m.
Location: Cotton Tree Inn, 1415 Bench Road, Pocatello, ID 83201

Date and Time: January 14, 2010: 7:00 p.m. to 9:00 p.m.
Location: Fairfield Inn, 230 West 7th Street North, Burley, ID 83318

Comments may also be submitted electronically to **minidoka_dam_eis@ usbr.gov** or by mail to:

The Bureau of Reclamation
Snake River Area Office
Allyn Meuleman, Activity Manager
230 Collins Road
Boise, ID 83702-4520
208-383-2258

The public meeting facilities are physically accessible. Those who need accessibility accommodations, including sign language interpreters or other auxiliary aids, may contact Ms. Meuleman. Requests should be made by December 28, 2009, to allow sufficient time to arrange for accommodation.

Requests to make oral comments at the public meeting may be made at each meeting. Comments will be recorded by a court reporter. In the interest of available time, each speaker will be asked to limit oral comments to five (5) minutes. Longer comments should be summarized at the public meeting and submitted in writing either at the public meeting or by mail to Ms. Meuleman and identified as meeting comments. To be included as public meeting comments, they should be postmarked by January 21, 2010.

Comments that are not to be included as part of the public meeting comments report must be postmarked by February 5, 2010.

You should be aware that your entire comment, including your personal identifying information, will be made publicly available in the Final EIS. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

We appreciate your interest and look forward to your comments.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosure

United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Mr. Chad Colter
Fish And Wildlife Director
Shoshone-Bannock Tribes
P.O. Box 306
Fort Hall, ID 83203-0306

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Dear Mr. Colter:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

Alternatives considered in the Draft EIS are Alternative A - No Action, as required under the National Environmental Policy Act; Alternative B - Spillway and Headworks Replacement (preferred alternative); and Alternative C - Spillway Replacement. Designation of Special Use Areas is included in both Alternatives B and C.

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We appreciate your interest and look forward to your comments.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosure

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TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Honorable Robert C. Bear
Chairman
Shoshone-Paiute Tribes
P.O. Box 219
Owyhee, NV 89832

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Robert

Dear Chairman:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

Alternatives considered in the Draft EIS are Alternative A - No Action, as required under the National Environmental Policy Act; Alternative B - Spillway and Headworks Replacement (preferred alternative); and Alternative C - Spillway Replacement. Designation of Special Use Areas is included in both Alternatives B and C.

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The Bureau of Reclamation
Snake River Area Office
Allyn Meuleman, Activity Manager
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We appreciate your interest and look forward to your comments.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosure

United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Ms. Yvette Tuell
Environmental Program Manager
Shoshone-Bannock Tribes
P.O. Box 306
Fort Hall, ID 83203-0306

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Dear Ms. Tuell:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

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Comments that are not to be included as part of the public meeting comments report must be postmarked by February 5, 2010.

You should be aware that your entire comment, including your personal identifying information, will be made publicly available in the Final EIS. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

We appreciate your interest and look forward to your comments.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosure

United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Honorable Alonzo Coby
Chairman
Shoshone-Bannock Tribes
P.O. Box 306
Fort Hall, ID 83203-0306

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Alonzo

Dear Chairman:

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

Alternatives considered in the Draft EIS are Alternative A - No Action, as required under the National Environmental Policy Act; Alternative B - Spillway and Headworks Replacement (preferred alternative); and Alternative C - Spillway Replacement. Designation of Special Use Areas is included in both Alternatives B and C.

Oral comments may be presented at one of three public meetings on the dates and locations listed below:

Date and Time: January 12, 2010: 7:00 p.m. to 9:00 p.m.
Location: Red Lion Inn, 475 River Parkway, Idaho Falls, ID 83402

Date and Time: January 13, 2010: 7:00 p.m. to 9:00 p.m.
Location: Cotton Tree Inn, 1415 Bench Road, Pocatello, ID 83201

Date and Time: January 14, 2010: 7:00 p.m. to 9:00 p.m.
Location: Fairfield Inn, 230 West 7th Street North, Burley, ID 83318

Comments may also be submitted electronically to **minidoka_dam_eis@ usbr.gov** or by mail to:

The Bureau of Reclamation
Snake River Area Office
Allyn Meuleman, Activity Manager
230 Collins Road
Boise, ID 83702-4520
208-383-2258

The public meeting facilities are physically accessible. Those who need accessibility accommodations, including sign language interpreters or other auxiliary aids, may contact Ms. Meuleman. Requests should be made by December 28, 2009, to allow sufficient time to arrange for accommodation.

Requests to make oral comments at the public meeting may be made at each meeting. Comments will be recorded by a court reporter. In the interest of available time, each speaker will be asked to limit oral comments to five (5) minutes. Longer comments should be summarized at the public meeting and submitted in writing either at the public meeting or by mail to Ms. Meuleman and identified as meeting comments. To be included as public meeting comments, they should be postmarked by January 21, 2010.

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Jerrold D. Gregg
Area Manager

Enclosure

United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

NOV 30 2009

SRA-1206
ENV-6.00

Mr. Herman Atkins
Tribal Department Administrator
Shoshone-Paiute Tribes
P.O. Box 219
Owyhee, NV 89832

Subject: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Dear Mr. Atkins: Herman

Enclosed for your review and comment is the Draft Environmental Impact Statement (Draft EIS) for the Minidoka Dam Spillway Replacement. The purpose of the project is to prevent structural failure of the existing spillway and headworks which are showing considerable signs of degradation.

In addition to correcting these structural problems, Reclamation is also proposing to designate Special Use Areas at the project site in accordance with 43 CFR Part 423 *Regulations, Public Conduct on Bureau of Reclamation Facilities, Lands, and Waterbodies.* These Special Use Areas will define what public uses are allowed in close proximity to the dam, spillway, and other facilities. The designation of these Special Use Areas will permit continuation of historic uses that are not currently permitted under the 43 CFR Part 423 Rules and Regulations.

Alternatives considered in the Draft EIS are Alternative A - No Action, as required under the National Environmental Policy Act; Alternative B - Spillway and Headworks Replacement (preferred alternative); and Alternative C - Spillway Replacement. Designation of Special Use Areas is included in both Alternatives B and C.

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We appreciate your interest and look forward to your comments.

Sincerely,

Jerrold D. Gregg
Area Manager

Enclosure

Appendix H Comments and Responses

Letters of Comments

Reclamation's Responses to Letters of Comment

Summary of Public Meeting Comments and Reclamation's Responses

In December 2009, the Draft EIS was mailed to 95 individuals, organizations, agencies, and congressional delegates for their review and comment. A similar letter was sent to 28 tribal governments. Written comments were accepted through February 5, 2010. Twelve letters of comment were received. The letters, with Reclamation's responses to the comments, are located in this appendix.

As described in Chapter 4, three public meetings were conducted on January 12, 13, and 14, 2010. Six individuals provided oral comments at the meetings. Four written comments were provided for inclusion into the Public Meetings Report. This report includes transcripts of the oral comments taken by a court reporter during the meetings, and written comments provided during the meeting or those received within a week following the meetings. This report is available for review at the Snake River Area Office in Boise, Idaho. A summary of both oral and written comments received at the public meetings including Reclamation's responses, is also included in this appendix and follows Reclamation's responses to the letters of comment.

The following provided letters of comment:

Comment Number	Agency/Individual	Date
FWS/Winslow 1	Dewayne Winslow, USFWS	January 21, 2010
FWS/Winslow 2	Dewayne Winslow, USFWS	February 8, 2010
FWS	U.S. Fish and Wildlife Service	February 5, 2010
FWS/Refuge	U.S. Fish and Wildlife Service, Minidoka Refuge	February 4, 2010
EPA	Environmental Protection Agency	February 5, 2010
COE	Corps of Engineers	January 28, 2010
BPA	Bonneville Power Administration	February 22, 2010
IDFG	Idaho Department of Fish and Game	February 4, 2010
ISP	Idaho State Parks	January 15, 2010
IWUA	Idaho Water Users Association	January 2, 2010

Comment Number	Agency/Individual	Date
FMID	Fremont-Madison Irrigation District	February 1, 2010
BID	Burley Irrigation District	February 3, 2010

Letters of Comments

FWS/WINSLOW 1

From: Dwayne_Winslow@fws.gov [mailto:Dwayne_Winslow@fws.gov]
Sent: Thursday, January 21, 2010 11:20 AM
To: Meuleman, Allyn G; Newman, Ryan L.
Subject: Minidoka Spillway project--new radial gates

Under current operations, use of the existing radial gates are primarily tied to powerplant operations. If the powerplant shuts down, the gates automatically open to continue flows. The DEIS states that the existing gates are only rarely used otherwise to pass water.

I did a search on the word "radial" throughout the document, and couldn't find any description of how the proposed 12 new radial gates will be utilized under proposed operations. Will they be primarily tied to powerplant operations? With the increased capacity of the new gates, I would think this would allow for use of the gates to pass water independently, or at least much more independently, of powerplant operations, compared to current operations.

Increased flexibility for use of the gates could be important for alternative ways to maintain trout fishery below the spillway, as well as directing flows for listed snails.

FWS/WINSLOW 1
01

Dwayne Winslow
Fish & Wildlife Biologist
U.S. Fish & Wildlife Service
Idaho Fish and Wildlife Office
1387 S. Vinnell Way, Room 368, Boise, Idaho 83709
208-378-5249
dwayne_winslow@fws.gov

History repeats itself. It has to; nobody listens. Steve Turner

Meuleman, Allyn G FWS/WINSLOW2

om: Dwayne_Winslow@fws.gov
ent: Monday, February 08, 2010 10:46 AM
To: Meuleman, Allyn G
Subject: Minidoka Spillway NEPA comments

Allyn,

Just caught a correction that could affect intepretation in our NEPA comments. On page 2, under Proposed Spillway and Reservoir Operations: Purpose and Need, and Flexibility to Adjust Proposed Operations--last paragraph, 4th line, change "exercised" to "exercising." FWS/Winslow2-01

Dwayne Winslow
Fish & Wildlife Biologist
U.S. Fish & Wildlife Service
Idaho Fish and Wildlife Office
1387 S. Vinnell Way, Room 368, Boise, Idaho 83709
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dwayne_winslow@fws.gov

History repeats itself. It has to; nobody listens. Steve Turner

United States Department of the Interior

IDAHO FISH AND WILDLIFE OFFICE

1387 S. Vinnell Way, Room 368
Boise, Idaho 83709
Telephone (208) 378-5243
http://www.fws.gov/idaho

FEB 05 2010

Memorandum

To: U.S. Bureau of Reclamation, Snake River Area Office, Boise, Idaho (Attn: Mr. Jerrold D. Gregg, Area Manager)

From: State Supervisor, Idaho Fish and Wildlife Office, Fish and Wildlife Service, Boise, Idaho

Russell R. Holder for Jeff Foss

Subject: Minidoka Spillway Replacement Project, Draft Environmental Impact Statement—Comments
1009.2500 14420-2010-CPA-0004

The Fish and Wildlife Service (Service) has reviewed the Bureau of Reclamation's (Reclamation) Minidoka Spillway Replacement Project (Project) Draft Environmental Impact Statement (DEIS), received on December 9, 2009. The attached comments are offered for your use and consideration, and are provided under the provisions of the Endangered Species Act of 1973 (ESA), as amended, the Migratory Bird Treaty Act of 1918 (MBTA), as amended, and the National Environmental Policy Act of 1969 (NEPA). Comments made here complement the Service's Final Fish and Wildlife Coordination Act Report for this project, which is being submitted simultaneously under a separate memorandum.

The combination of the proposed spillway replacement with proposed changes in operations post-construction make this a complex project, with many potentially interrelated effects. We commend Reclamation for producing a well-organized, detailed, and thoughtful DEIS. This has facilitated our review. These comments are offered in the spirit of coordination as a cooperating agency, and we are available to discuss our comments in more detail if requested.

Through our comments, the Service is highlighting how the analysis described in the DEIS can be strengthened. In addition, under our NEPA authorities and as a cooperating agency, we address other natural resource and policy issues regarding the adequacy of the DEIS.

Attachment

cc: IDFG, Jerome (McDonald)
FWS-SEID, Chubbuck (Casselman)
FWS-MNWR, Rupert (Krueger)
BOR-SRA, Boise (Meuleman)

TAKE PRIDE IN AMERICA

FWS

Bureau of Reclamation Minidoka Spillway Replacement Project, Draft Environmental Impact Statement: Comments

After careful review of the DEIS, we note that the environmental analysis tends toward an optimistic outcome for many natural resources of concern. Many of our comments below are directed toward achieving a more objective analysis.

Proposed Spillway and Reservoir Operations: Purpose and need, and flexibility to adjust proposed operations

There is considerable analysis of the potential environmental effects that could result from the spillway and reservoir operational changes proposed in the project, but the purpose and need for changing spillway operations and the reservoir winter drawdown period are not stated in Chapter 1 and are not clearly stated elsewhere in the document. The FEIS should state the purpose and need for changing spillway and reservoir operations, and clarify if the changes are proposed in order to produce additional power. FWS-01

In addition, we would like the FEIS to state the following:

- Clearly state if the degree of flexibility to change proposed minimum summer spillway flows and the winter reservoir level will be limited by power production. FWS-02
- Clearly state, and commit to in the FEIS, the degree of flexibility Reclamation will exercise to minimize or avoid impacts to natural resources of concern, including increasing minimum summer spillway flows to some level between 500 cfs and 1,300 cfs and lengthening the period the reservoir might need to be kept below full pool in winter (both permanently if need be), keeping in mind that if impacts due to operational changes do not occur to natural resources, this flexibility may never be needed. FWS-03
- Clearly state that natural resources would be impacted or lost should monitoring indicate that these resources would be impacted by changes in spillway and reservoir operations which Reclamation will not have the flexibility to change in order to minimize or avoid such impacts or losses. FWS-04

For purposes of the above, we define natural resources of concern to not be limited to listed snail species. FWS-05

In section 3.20 of the DEIS, Unavoidable Adverse Effects are defined as "environmental consequences that cannot be avoided either by changing the nature of the action or through mitigation, if the action is taken." The Service believes that if impacts to natural resources of concern could be avoided by Reclamation exercised flexibility regarding operational changes but cannot or does not choose to do so in favor of power production or other reasons, then these impacts come very close to meeting the definition of unavoidable adverse effects in section 3.20. Any unavoidable impacts should be disclosed in section 3.20. FWS-06

The Service's concern is that, once additional power has been produced by directing more water through the powerplants based on the proposed spillway and reservoir operations, potentially impacting natural resources, the ability to scale back power production may be difficult to realize. Should monitoring reveal that natural resources of concern are being impacted by such operations, Reclamation may not be able to subsequently acquire the flexibility needed to redirect that water over the spillway or to lengthen or manipulate the winter drawdown period to minimize or avoid such impacts. Without clearly stating the degree of flexibility it will retain and its intent to retain that flexibility in the FEIS, the Service is not confident that operational changes can be modified sufficiently to address natural resource concerns identified through monitoring. FWS 07

Operational Changes to Reservoir Levels

Reclamation has committed, in Appendix E of the DEIS, to consult with IDFG and the Refuge to develop and implement a winter drawdown strategy. This will be critical, since the proposed shorter duration of the winter drawdown of Lake Walcott has potential to affect waterfowl and migratory water bird and shore bird foraging areas, productivity of waterfowl forage plants, nesting habitat, invasive species, game fish spawning areas, refugia for juvenile fish, and beaver (*Castor canadensis*) and muskrat (*Ondatra zibethica*) populations.

The environmental baseline presented in the DEIS for waterfowl (defined here as ducks, geese, and swans) and other migratory birds is relatively complete, and provides a good sense of why the Refuge has been designated an Important Bird Area. However, the DEIS does not analyze project impacts to waterfowl other than trumpeter swans (*Cygnus buccinator*) and tundra swans (*Cygnus columbianus*). The Service recommends a strong analysis of project impacts to waterfowl, and a more in depth analysis of impacts to other migratory water birds and shore birds than is currently presented in the DEIS. The Service encourages consultation with IDFG and the Refuge to obtain, if available, aerial photos, GIS data, or other data that may quantify or estimate the extent of mud flats used by waterfowl; waterfowl resting, nesting, and foraging areas that could be affected by the change in reservoir operations; and affected habitat used by other migratory water birds. If data is unavailable, this should be acknowledged. Reclamation should describe how data needed to evaluate these impacts would be obtained. FWS-08

We recommend that Reclamation commit to monitoring the effects of the new drawdown period on the resources of interest, including waterfowl and migratory water bird and shore bird habitat as mentioned in the previous paragraph. We recommend the winter drawdown strategy include, in cooperation with IDFG and the Refuge, management strategies attached to monitoring results, in keeping with our comments below under *Adaptive Management*. FWS-09

The DEIS describes a shortened winter drawdown period as likely to result in beaver and muskrat population increases (page 138). The current winter-long 5-foot drawdown exposes their dens to predation, and the implication is that shortening the period of drawdown will result in protecting their dens from predation. However, IDFG and Refuge biologists advise that beaver use both lodges and bank dens, and usually complete

their winter dens by the end of October. Historically, the winter drawdown is completed at the end of October. If beaver have placed their bank dens in relation to whatever water level the reservoir has been drawn down to by the end of October, raising the reservoir at that time would flood their dens. IDFG and Refuge biologists were unable to predict how beaver might react to this. This same scenario could apply to muskrat, though IDFG and Refuge biologists also commented that muskrat populations are often controlled by lowering marshes in winter (similar to current reservoir operations) and allowing them to freeze. If the change in winter drawdown does result in beaver and muskrat population increases, IDFG and Refuge biologists concur that they could impact habitat used by species of concern such as cottonwood trees (*Populus spp.*), willow (*Salix spp.*), and cattail (*Typha spp.*) stands as described on page 138. We recommend that Reclamation conduct additional review and analysis to resolve this issue. FWS-10

Establishment and spread of Eurasian milfoil or other non-native/invasive species could result in loss of habitat value for fish and wildlife species that use shallow riparian areas. Monitoring protocols will need to be devised to detect early presence of invasive species, should they become established. Adapting the timing and duration of reservoir drawdown periods may control milfoil, a shallow water species, by freezing it. Different methods may be required for other aquatic invasive species. We recommend that the FEIS provide for developing an aquatic invasive species control program in the event that changes in reservoir operations result in establishment of Eurasian milfoil or other invasive species. FWS-11

The proposed shortened winter drawdown period (no more than two months) may allow the threatened Utah valvata (*Valvata utahensis*) snail to colonize areas of the reservoir unavailable to them under the current six-month drawdown period. A winter drawdown strategy implemented every few years to benefit waterfowl may have potential to impact Utah valvata populations that have colonized new areas. The potential for these effects would need to be presented in the FEIS and the Biological Assessment. FWS-12

We recommend that Reclamation consider and address in the FEIS that maintaining a full pool for longer periods in winter to produce power or for other reasons could impact natural resources of concern to an extent that reservoir levels may need to be lowered in winter for longer periods than assumed in the DEIS. We recommend that Reclamation clarify its flexibility to adapt to this possibility. FWS-13

Operational Changes to Spillway Flows

The Service agrees that the proposed minimum winter (November through March) spillway flows of 100 cfs would be an improvement over existing conditions, and would be beneficial to organisms utilizing the spillway wetlands.

Analysis of potential effects resulting from the proposed minimum summer spillway flows of 500 cfs are found in sections 3.2, 3.6, and 3.8 of the DEIS.

The potential for the frequency, timing, and duration of 500 cfs flows to occur is not apparent in section 3.2 because:

A) Table 3-2 lists flows averaged over a period of 72 years for a given month; and

B) Table 3-3 lists average monthly flows for a given year by averaging flows for all months of the year.

Of interest to the Service is the potential for minimum flows to occur during the irrigation season, defined as April through October. This is the period when, under the proposed operational changes, conditions could be most limiting to organisms using the spillway pools and wetlands.

The best depiction of the potential for minimum flows to occur, and of the degree of change represented by the proposed minimum flows, can be derived by using daily flow data from the USGS gage # 13081500 below Minidoka Dam near Howell's Ferry. The Service conducted such an analysis for the years 1997 through 2008 (Appendix). Our analysis indicates there is potential for the proposed minimum summer spillway flows of 500 cfs to occur for the entire irrigation season for several years in a row. Our analysis assumes that the powerplants would be running at full capacity when sufficient water was available. This may represent a worst-case scenario, since even with sufficient water, the powerplants may not always run at full capacity for various reasons. However, even with accounting for the actual amount of water directed through the powerplants real-time, our analysis indicates there remains potential for flows of 500 cfs to occur for one to two months during the hottest part of the summer, for several years in a row.

The Service would like to see a similar analysis presented in the FEIS using data from 1980 through 2008 that includes actual flows directed through the powerplants, and the flows directed over the spillway. This period captures the changes imposed on spillway flows, and also captures the period during which effects of climate change on precipitation in the Snake River Basin may begin to be manifested. The presentation should indicate the timing, frequency, and duration with which these flows would have resulted in spillway flows of 500 cfs actually occurring, had the powerplants been running at full capacity of 8,600 cfs. FWS-14

We expect that the results would indicate that minimum summer spillway flows of 500 cfs could occur significantly more frequently, and for significantly longer duration during periods of high summer temperatures, than implied in the DEIS. If correct, this would require a re-analysis of impacts to listed snails, the spillway rainbow trout (*Oncorhynchus mykiss*) fishery, waterfowl and other migratory birds using the spillway wetlands, and to wetland ecology below the spillway. The Service will be available to work with Reclamation to implement this analysis if requested. FWS-15

Potential Impacts of Proposed Minimum Summer Spillway Flows
The Service's concern over the timing, frequency, and duration with which 500 cfs flows might occur stems from the lack of knowledge of how such flows may affect ecological processes and organisms in the wetlands below the spillway.

The recommendation for the current minimum summer spillway flows of 1,300 to 1,900 cfs was developed through a study that determined water temperature increases associated with increased travel time of water through the spillway (Maintenance of the Fish Resources at Minidoka Dam with Enlargement of the Powerhouse, Hiebert and Bjornn 1980). The researchers developed a water temperature-flow rate curve to predict spillway water temperatures at varying flow rates, and compared those temperatures to water temperatures required to maintain the trout fishery in the waters below the spillway. Study results were complemented by a consensus reached by personnel from IDFG, the Service, Water and Power Resources Service, and the researchers, based on observations, that spillway flows of 1,300 cfs would provide adequate wetted habitat for trout, good fishing access, and prevent spillway pool temperature increases of greater than 1^0 C (1.8^0 F). The researchers further concluded, based on test results in 1979, that adequate trout habitat would be provided at flows of 1,000 cfs, but temperature increases would be a problem. "One thousand cfs should be considered the absolute minimum flow to maintain adequate trout habitat. This flow would not supply adequate temperatures *during most of the summer* (Hiebert and Bjornn 1980) (italics added)."

The report did not recommend the 1,300 to 1,900 cfs minimum spillway flows in order to lower water temperatures below the spillway by releasing colder water from the reservoir, as the first paragraph on page 103 of the DEIS seems to imply. Water temperatures measured in the reservoir during the study period were similar to those measured by Reclamation in 2005 (Bureau of Reclamation 2009). Rather, the recommendations were made as the minimum flows required to move water through the pools below the spillway quickly enough to prevent water temperature increases, due to effects of insolation, that would degrade the trout fishery below the spillway. FWS-16

The DEIS states that water travel time across the spillway will . . . "increase slightly due to the reduction in flow," and that the increase in travel time at 500 cfs combined with changes in the width-to-depth ratio of the spillway pools will result in water temperature increases that will likely be "less than a few tenths of a degree Celsius" (section 3.4, page 83). However, there are no data or references cited to support these statements. Hiebert and Bjornn found that when spillway flows were reduced from 1,300 cfs to 670 cfs, water travel time doubled, and when flows were reduced from 1,900 cfs to 670 cfs, travel time increased by three times. Their predictive curve suggests that water temperatures could increase by as much as 2.5^0 C (4.5^0 F) if flows are reduced from 1,900 cfs to 500 cfs. FWS-17

A review of Hiebert and Bjornn's results further indicates two things:

A) Applying their predicted temperature increases to spillway water temperatures measured at 1,300 to 1,900 cfs by Reclamation (Bureau of Reclamation 2009), indicates that summer spillway water temperatures could rise to greater than 26.1^0 C (79^0 F), nearly

at the top range of the Upper Incipient Lethal Temperature (UILT) for rainbow trout (UILT = 25^0 to 26.7^0 C (77 to 80.1^0 F));

B) Adding the water temperature increases predicted for the spillway pools by their curve at flows of 1,300 to 1,900 cfs (about 1^0 C (1.8^0 F)) to the reservoir temperatures measured in their study produces temperatures similar to those measured in the pools by Reclamation (Bureau of Reclamation 2009) (Table 3-11 in the DEIS), suggesting that the current minimum spillway flows are in fact producing the expected—and desired—effect, i.e., current flows are keeping temperature increases in the spillway pools to about 1^0 C.

At high water temperatures, low dissolved oxygen levels are a limiting factor for rainbow trout. Anecdotal evidence indicates that during periods of high summer temperatures, even at the current minimum flows of 1,300 to 1,900 cfs, rainbow trout below the spillway are found almost exclusively where water cascading over the spillway churns the water in the pools, i.e., where dissolved oxygen levels would be the highest (Newman pers. com. 2010). Water temperatures of greater than 26.1^0 C (79^0 F) (nearly at the top range of the UILT for rainbow trout) in the spillway pools would mean that rainbow trout would likely either leave the pools or die. This could effectively remove the spillway trout fishery for a significant portion of each summer. FWS-18

The presence, abundance, and distribution of organisms tends to often be limited by the short-term extreme conditions that occur in a given location. The potential for flows of 500 cfs to occur for at least one to two months for several years in a row, separately or combined with potential water temperature increases in the spillway pools up to or greater than 26.1^0 C (79^0 F), could be limiting to fish and wildlife resources in the spillway pools and wetlands. Negative impacts from reduced flows could include, but are not limited to, increased algal growth, undesirable changes in species composition of aquatic macrophytes, and undesirable changes in the aquatic macro- and micro-invertebrate communities. FWS-19

Based on Hiebert and Bjornn's report, anecdotal evidence of trout distribution, and the potential for flows of 500 cfs to occur for significant periods of time, the Service recommends that the impacts of the proposed minimum summer spillway flows of 500 cfs on the rainbow trout fishery below the spillway be re-evaluated in the FEIS. The analysis should also consider impacts to other aspects of wetland function and aquatic resources below the spillway, including listed snails. The effects of high summer water temperatures combined with lower flows on listed snails in the spillway pools, particularly Snake River physa (*Physa natricina*), are unknown. The known information on Snake River physa suggests that it requires cool to cold flowing water with high dissolved oxygen content. The presence of these requirements in the spillway pools could be affected by higher water temperatures and the proposed minimum spillway flows. We recognize that the new spillway design will shorten the distance and time water entering the south channel through the large pipe and the radial gates will travel through the spillway. However, this would not be sufficient reason to state in the FEIS, without supporting data, that water temperatures in the pools will not increase to a point FWS-20

of concern. In absence of similarly obtained temperature/flow-rate data to the contrary, the re-evaluation should assume that the spillway pool temperatures predicted by Hiebert and Bjornn could occur under the proposed minimum spillway flow rates during the hottest summer months, with potential impacts analyzed accordingly. FWS-21

Fish Entrainment in Canals

Reclamation's proposed headworks replacement on the North Side and South Side canals does not include installation of barriers to minimize or prevent fish entrainment into the canals. However, Chapter 9 of Title 36 of the Idaho Code provides that canals and diversions in the state of Idaho shall not be operated without a screen or other suitable device in place to prevent fish from entering canals or diversions. Fish entrainment through the canals was not declared outside the scope of the project in section 1.5.2 of the DEIS, and should be addressed in the analysis. FWS-22

Losses of rainbow trout, white sturgeon (*Acipenser transmontanus*), and smallmouth bass (*Micropterus dolomieu*) to entrainment in the North Side and South Side canals represent continued unmitigated losses of fish resources. IDFG states that most fish entrained are rainbow trout, and occasionally white sturgeon (Megargle pers. comm. 2010). Most entrained white sturgeon are trapped and returned to the river above the dam. Loss of some percentage of these species in the canals represent a cost to the state of Idaho, since they are replaced from hatchery stocks. In addition, trout and other fishes entrained in the canals represent prey that has become largely unavailable to fish-eating birds that forage in the reservoir and the spillway.

We recommend that Reclamation include the following in the FEIS to ensure that a full and adequate evaluation occurs for impacts from entrainment: FWS-23

- The new headworks will likely remain functional for at least as long as the existing headworks (i.e., at least a century) so an opportunity to include fish barriers as part of new headworks will not occur again for a very long time.
- Once the new headworks are installed, retro-fitting them post-construction with fish barriers would likely incur higher costs than if barriers are installed as part of the proposed project. This higher cost would likely decrease the probability of installing fish barriers in the future, and the current unmitigated loss of fish resources would continue.
- Without an alternatives analysis, including analyses of types of barriers suitable to these conditions and their costs, a viable plan for soliciting funding to include barriers as part of the current project cannot be formed. Funding sources could include the state of Idaho, irrigation districts, congress, NGOs, and other partners.
- The canals will be operated in violation of the Idaho Code as long as the canals remain without fish barriers, and unmitigated loss of fish resources would continue.

Based on the above discussion, the Service strongly recommends that Reclamation include a third action alternative in the FEIS, such that fish barriers are designed into the proposed headworks for the North Side and South Side canals. We recognize that FWS-24

designing and installing fish barriers as part of replacing headworks for the canals may increase the cost of the project. However, including a third action alternative would present a full range of alternatives in the FEIS, ranging from spillway replacement without canal headworks replacement; spillway replacement with canal headworks replacement; and spillway replacement with canal headworks replacement to include fish barrier installation. We expect that analysis of the effects of this third alternative would be based on consultation with IDFG, the Service, and the Refuge, and would include (but not be limited to) a discussion of costs and benefits to: fish and other species; IDFG for replacing fish; recreational opportunities; and building and maintaining the barriers. In addition, we recommend that the No Action Alternative include a more in-depth analysis than contained in the project DEIS of the impacts to fish and other species, IDFG's long-term costs, and recreational opportunities foregone, without fish barriers in place. FWS-25

Adaptive Management

The potential for impacts to many natural resources resulting from operational changes proposed in this project are largely unknown. Reclamation's commitment to the adaptive management process and its ability to develop specific adaptive management strategies will be critical to its ability to respond to the natural resource issues discussed here, and to new conservation concerns that will inevitably rise.

We recognize that discussion throughout the DEIS relating to monitoring to identify potential impacts is meant to relate to adaptive management. Also, Reclamation agreed in Appendix E to work with the Service, IDFG, and the Refuge to develop project adaptive management strategies, ". . . within authorized reservoir operations, state water law, repayment contracts, flow augmentation commitments, Biological Opinion (Bi-OP) requirements, and within the proposed flows through the water release gates working capacity. These actions are dependent upon funding." This agreement was in response to the Service's recommendation regarding adaptive management, presented in our Draft Fish and Wildlife Planning Aid Memorandum, submitted for this Project on October 14, 2009.

The Service recommends, however, that Reclamation be more specific in describing and committing to adaptive management strategies. Adaptive management strategies and any subsequent response actions that are dependent on "future funding" cannot be viewed by the Service as a commitment. Without a stronger commitment, it is unclear whether Reclamation can truly respond to resource concerns. We also recommend that specific management strategies be attached to monitoring in order to minimize or mitigate impacts, i.e., if condition 'X' exists, then management action 'Y' will take place to minimize or mitigate identified impacts. For example, if monitoring of waterfowl forage plants in Lake Walcott indicates an undesirable reduction in abundance or distribution resulting from changes in timing or duration of reservoir drawdown levels, Reclamation would implement changes in reservoir drawdown timing and duration to improve forage plant productivity to some pre-determined level. Reclamation's commitment to the adaptive management process and its ability to develop specific adaptive management strategies will be critical to its ability to respond to the natural resource issues discussed here in practical manner. FWS-26

Staging Areas

In section 2.3.7, pages 25 and 26 of the DEIS, five staging areas are described to accommodate construction equipment, waste, etc. Post-construction restoration is proposed for four of the staging areas. Restoration is not proposed for the remaining staging area, a 0.36 acre area north of and adjacent to the main powerplant switchyard. Review of the DEIS maps suggests that restoration may not have been proposed for this area because it is already disturbed. If this is the case, it should be stated in section 2.3.7. FWS27

Literature Cited

Hiebert, P.D., and T.C. Bjornn. 1980. Maintenance of the fish resources at Minidoka Dam with Enlargement of the Powerhouse. Idaho Cooperative Fishery Research Unit, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho. Completion report, submitted to: Water and Power Resources Service, U.S. Department of the Interior, Boise, Idaho. August, 1980.

Appendix

Minidoka Dam Spillway Flow Rates (cubic feet per second [cfs]) for Years 1997 through 2008 with Maximum Inman Powerplant Capacity of 8,600 cfs Subtracted Out: Table and Graphs

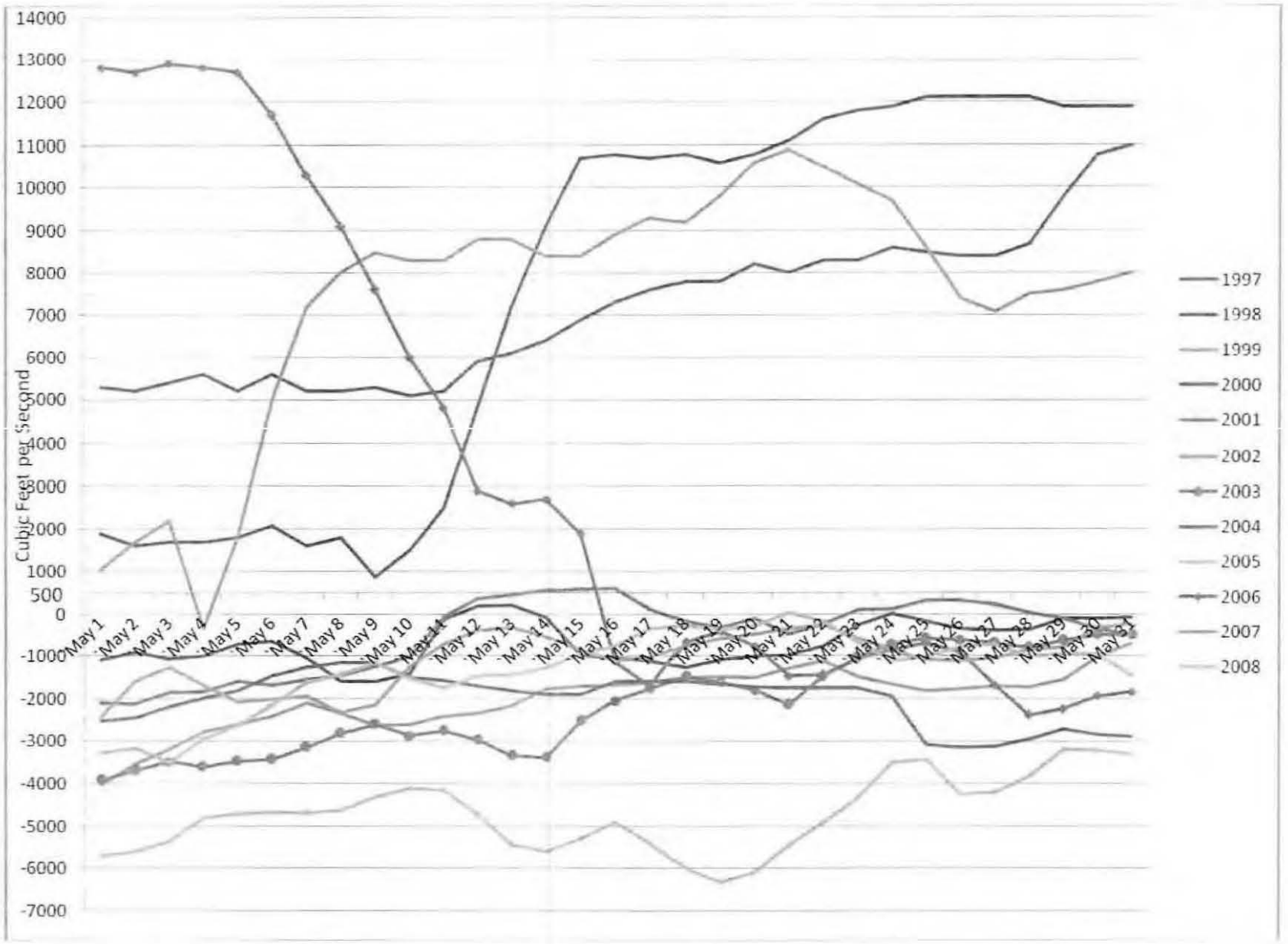
Years per month in which spillway flow rates would have been at 500 cfs, using data from USGS gage at Howell's Ferry for years 1997-2008 (12 years). See following graphs.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
April					X	X	X	X	X	Z (18 days)	X	X
May				X	Z (26 days)	X	X	X	X	X	X	X
June					X	X	X	X	X	X		
July					X	X	X	X				
August					X	X	X	X	Z (26 days)		Z (26 days)	
September		Z (21 days)	X	X	X	X	X	X	X	X	X	X
October		X	X	X	X	X	X	X	X	X	X	X

X = Spillway flows at 500 cfs for entire month.

Z = Spillway flows at 500 cfs for > 15 days per month.

Blue = spillway flows > 500 cfs.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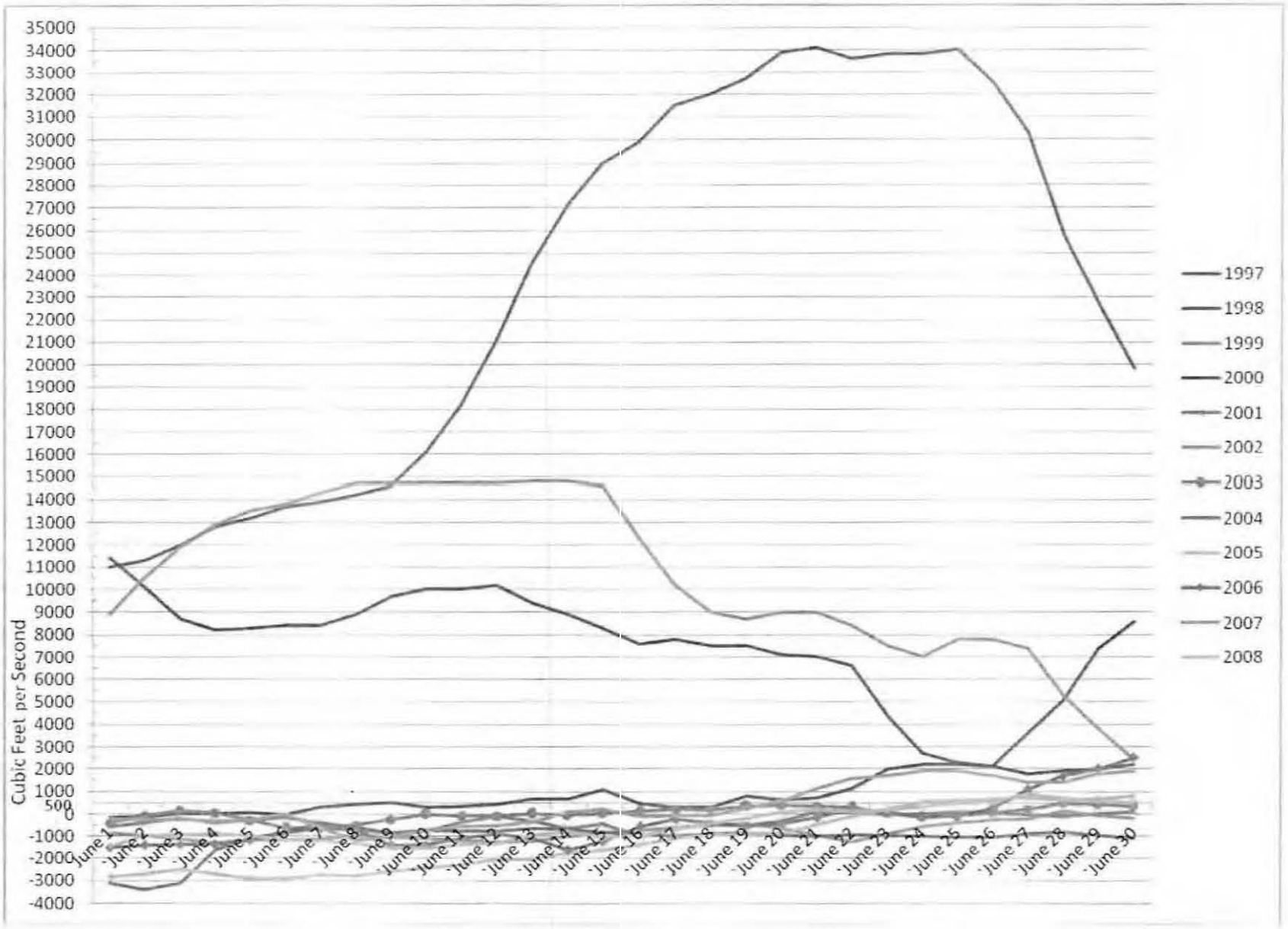
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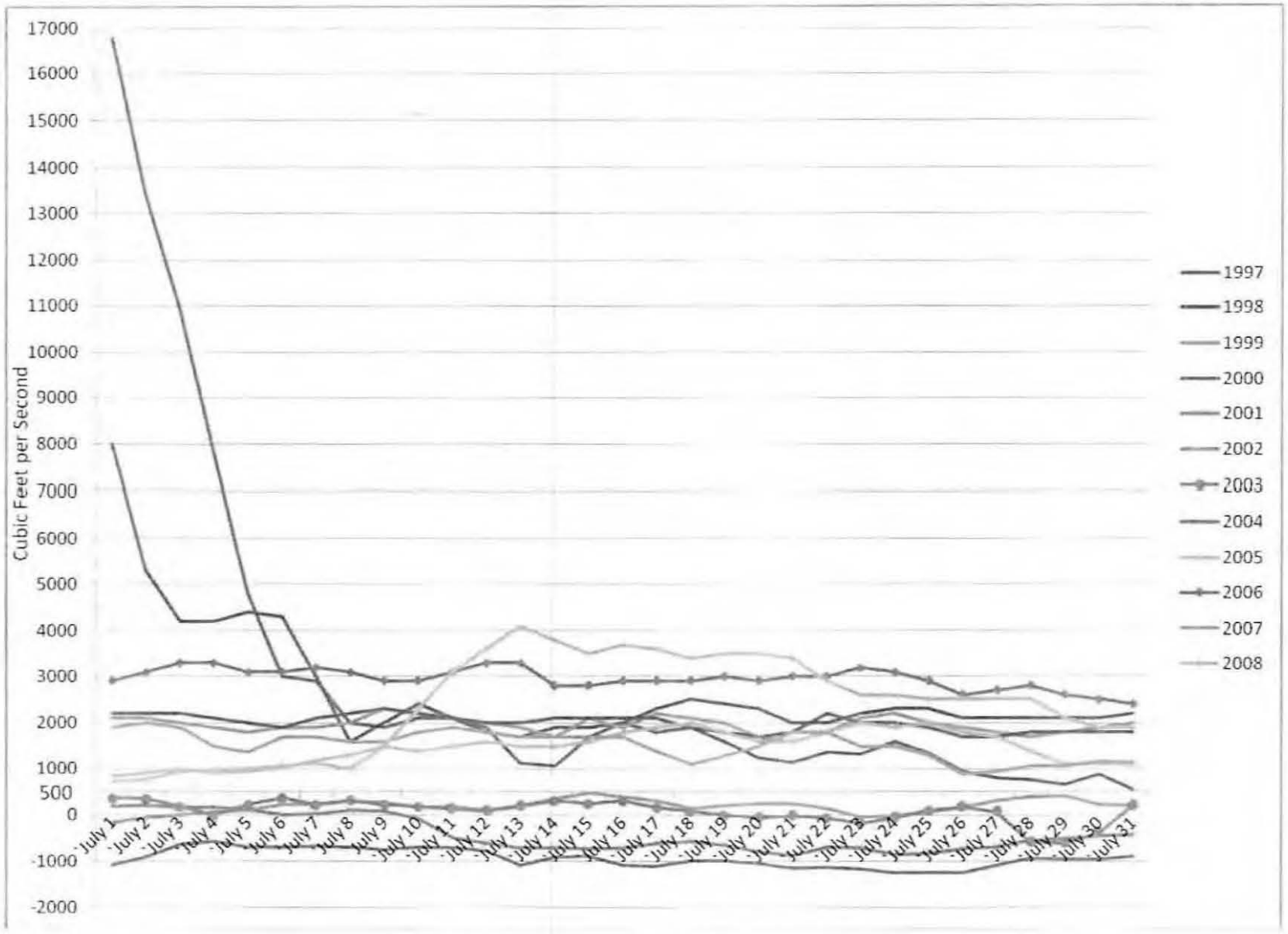
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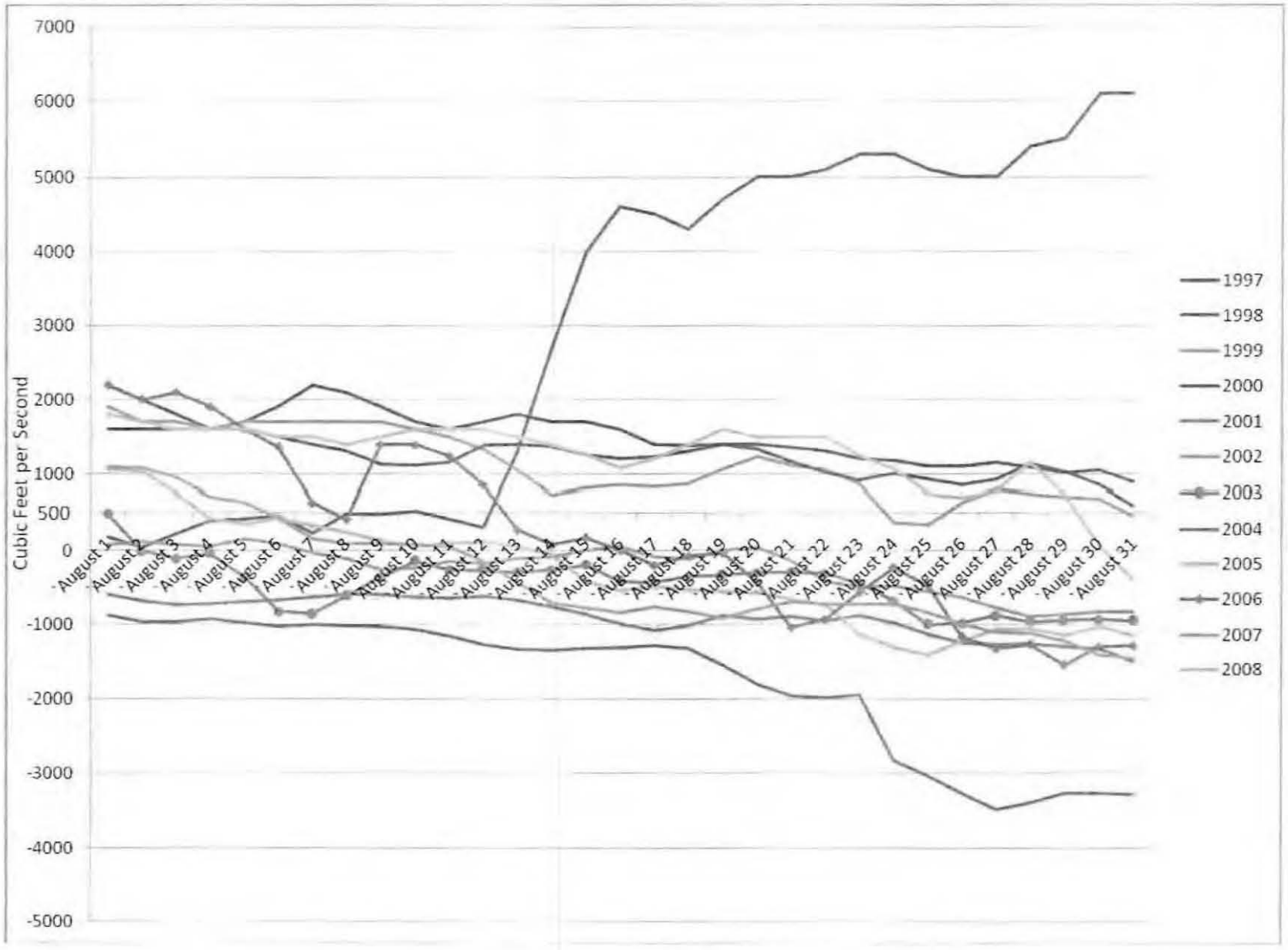
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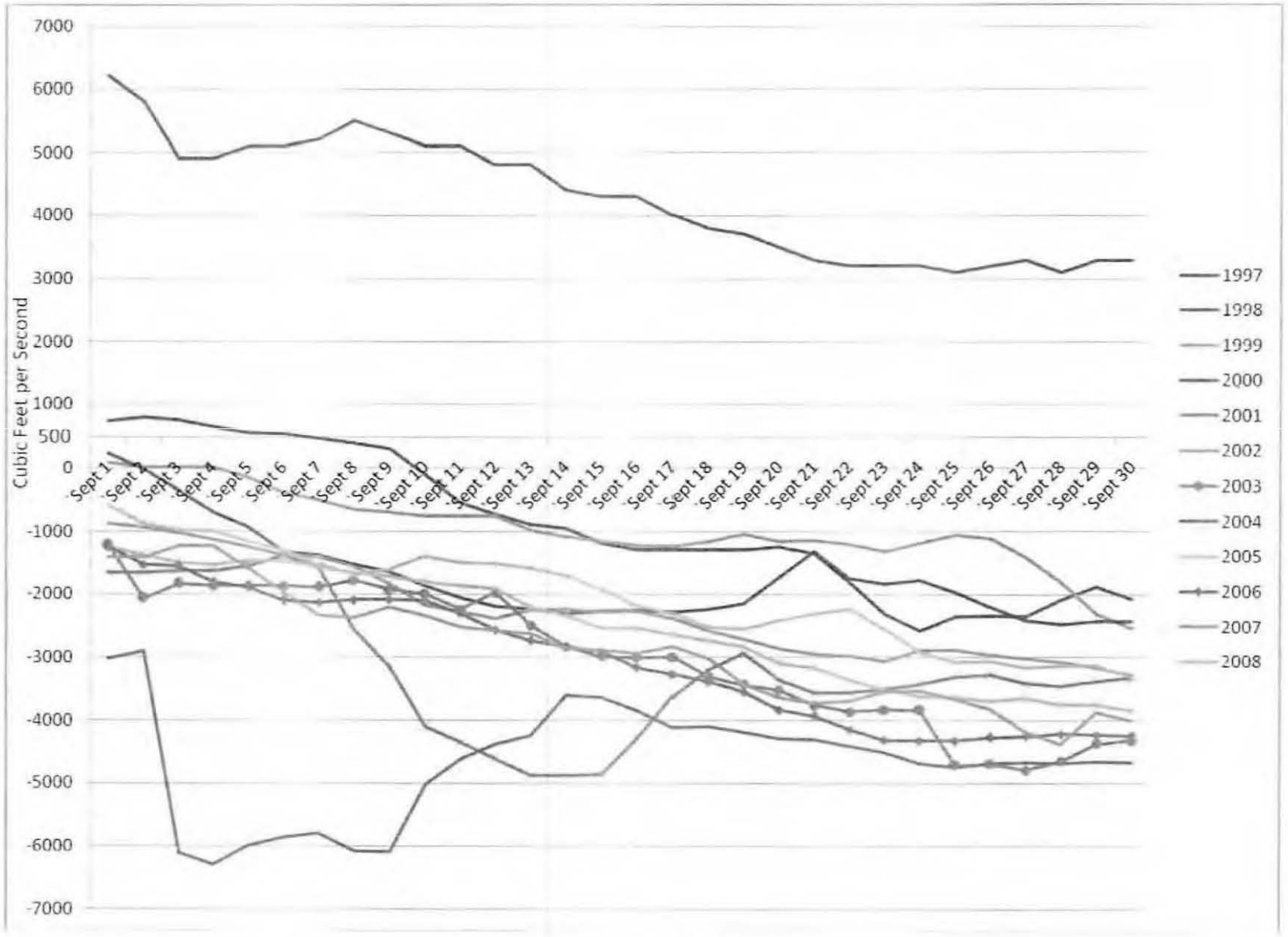
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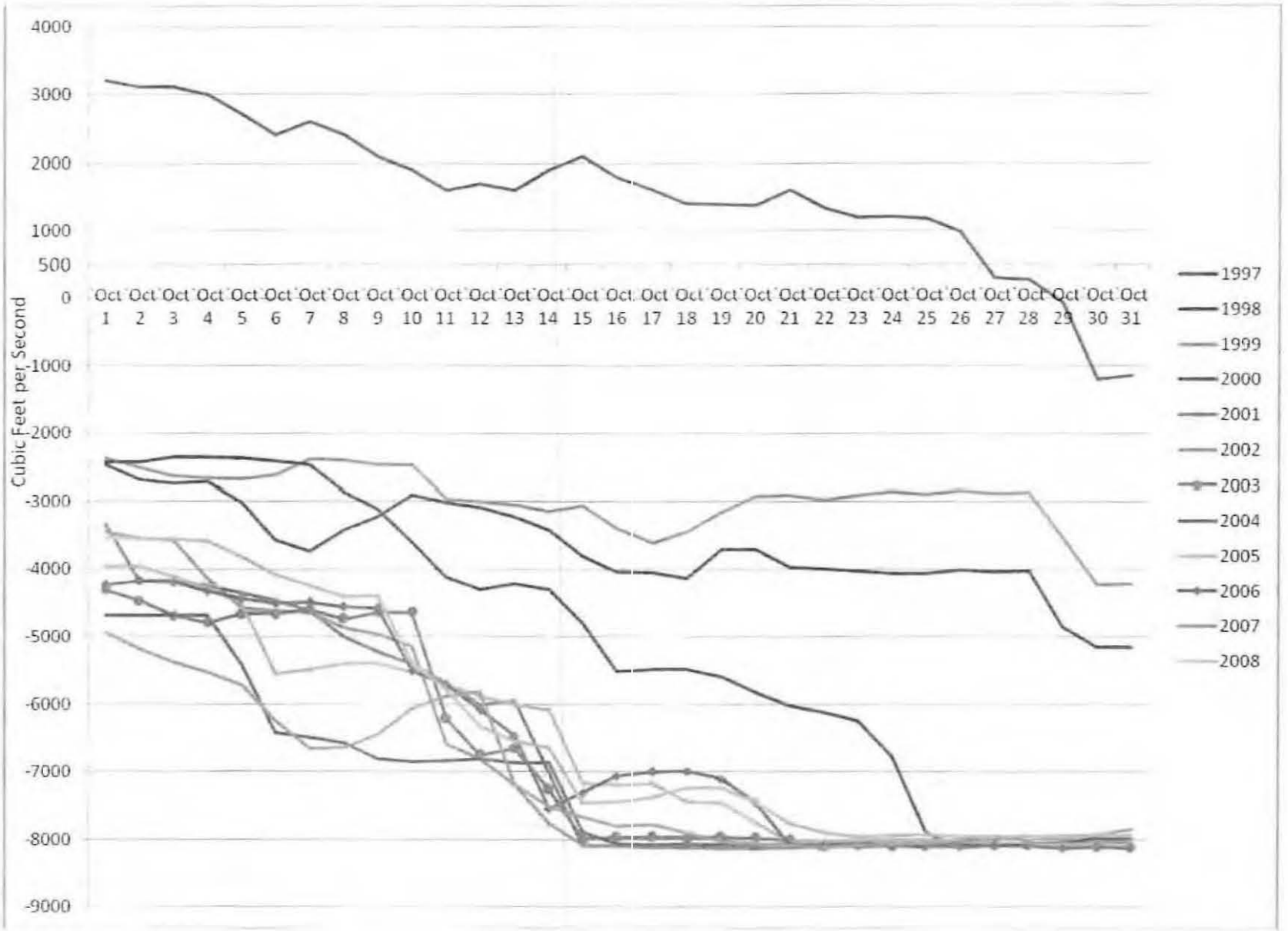
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FWS/REFUGE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Southeast Idaho Refuge Complex
4425 Burley Drive, Suite A
Phone 208-237-6615 Fax 208-237-8213

In Reply Refer To:

February 4, 2010

Bureau of Reclamation
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

Attention: Allyn Meuleman, Activity Manager

Thank you for the opportunity to comment on the Minidoka Dam Spillway Replacement (Project) Draft Environmental Impact Statement (DEIS). These comments pertain to the impacts of the proposed project on the infrastructure of the Minidoka National Wildlife Refuge (Refuge), which is administered by the United States Fish and Wildlife Service (FWS) at Lake Walcott.

Concerns about biological impacts of the Project will be conveyed by the Ecological Services Division of the FWS, under authority of the Fish and Wildlife Coordination Act.

The proposed action area is on land administered by the FWS as part of Minidoka Refuge. This refuge was established, in 1909, as a sanctuary for migratory birds. Since that time, the FWS has developed a management strategy predicated on a winter draw down of the reservoir. Much of the Refuges infrastructure will be negatively impacted by the proposed action. Specifically, there are two impoundments on the south side of the lake, a public boat ramp at Gifford Springs and a boathouse at the Refuge Headquarters that will be severely damaged by ice, if the reservoir is held at full pool throughout the winter. FWS/Refuge 01

These facilities are critical to management of the Refuge. The impoundments are used to provide nesting and feeding habitat for waterfowl; the Gifford Springs boat ramp provides the best access to Lake Walcott east of Bird Island and is very popular with local fisherman. All Refuge management activities on Lake Walcott are initiated from the boathouse located at the headquarters. These include routine patrols and emergency operations. Without a functional boathouse Refuge operations will be hampered and emergency response seriously compromised.

The current estimate to replace Refuge facilities, that will be damaged if the proposed actions in the DEIS are implemented, is $1,116,844. I encourage the Bureau of Reclamation to strongly consider the impacts elevated winter water levels, in Lake Walcott, will have on Refuge infrastructure and budget replacement cost into implementation of the Project. FWS/Refuge 02

Please contact me immediately if you need any further information.

Sincerely,

Tracy Casselman
Project Leader

EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

RECEIVED
FEB 10 10
OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

February 5, 2010

Allyn Meuleman
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

RE: EPA Region 10 Review of the Draft Environmental Impact Statement for the Minidoka Dam Spillway Replacement (EPA Project Ref: 08-063-DOI)

Dear Mr. Meuleman:

The U.S. Environmental Protection Agency (EPA) has reviewed draft Environmental Impact Statement (DEIS) for the Minidoka Dam Spillway Replacement Project (CEQ Number 20090429) in Minidoka County, Idaho. Our review of the DEIS was conducted in accordance with our responsibilities under National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

Section 309 specifically directs the EPA to review and comment in writing on the environmental impacts associated with all major federal actions. Under our Section 309 authority, our review of the DEIS considers the expected environmental impacts, and the adequacy of the EIS in meeting procedural and public disclosure requirements of NEPA.

The DEIS examines two action alternatives to correct structural problems at the Minidoka Dam Spillway and associated facilities on Lake Walcott. We focused our review on Alternative B (total replacement of the spillway and headgate structures), which was identified as the preferred alternative in the DEIS. We recognize the importance of this facility in southern Idaho, and the need to prevent structural failure of the spillway and canal headworks. We also appreciate the attention given to the need to maintain flow to the wetland complex below the dam. We do have a limited range of concerns with the project, principally related to the analysis of water quality impacts, the potential extent of jurisdictional wetlands, and the extent to which the wetlands below the dam would be monitored and adaptively managed. Each of these concerns is detailed below:

Water Quality

In section 3.4.2 the DEIS describes the methods to be used to evaluate potential water quality impacts, and the indicators to be used. The water quality impact indicators listed are:

- Movement of sediment as channel substrate
- Suspended sediment concentration and movement through the water column
- Water temperature
- Nutrients – Total Phosphorous concentration and movement through the water column.

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We concur with the selection of impact indicators. What is less clear is how the conclusions in the DEIS regarding water quality impact were reached. Page 82 of the DEIS, for example, indicates that Alternative B should not affect the normal cycling and transport of nutrients in the reservoir. A similar conclusion is reached on page 83 for the reach downstream of the dam. We recommend that the FEIS provide a more robust discussion as to how these conclusions were reached. The application of the MODSIM model provided a good comparison of hydrologic conditions under different alternatives, but it does not allow for the comparison of other parameters, such as temperature, phosphorous, or suspended sediments. This may require the employment of a model capable of simulating water quality in lakes and reservoirs, such as CE-QUAL-R1[1]. EPA-01

Wetland Delineation

The DEIS notes that 5.2 acres of spillway habitat would be converted to permanently watered reservoir habitat. Although the DEIS describes the physical characteristics of the site, it is not clear whether a wetland delineation has been conducted for this site. We recommend that the FEIS clarify whether any jurisdictional wetlands exist in the area to be inundated. If wetlands are present, we recommend that a functional assessment be conducted. This information will be necessary to inform the CWA 404 permitting process. EPA-02

Monitoring and Adaptive Management

Page 147 of the DEIS indicates that monitoring would be conducted to determine whether the wetland complex below the dam would be affected by the reduction in flow from the spillway. We are pleased to see this monitoring component included in the DEIS. We recommend that this discussion be expanded in the FEIS to include a discussion of thresholds, and how impacts to the wetlands would be defined. We further recommend the inclusion of potential mitigation measures, such as increased flow from the water release gates. EPA-03

Based on our analysis, we have rated this DEIS as EC-1 (Environmental Concerns – Insufficient Information). An explanation of this rating is enclosed. We appreciate the opportunity to provide comments, and I encourage you to contact Teresa Kubo of my staff with any questions at 503-326-2859 or kubo.teresa@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediment Management Unit

[1] http://smig.usgs.gov/cgi-bin/SMIC/model_home_pages/model_home?selection=cequalr1

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COE

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
IDAHO FALLS REGULATORY OFFICE
900 NORTH SKYLINE DRIVE, SUITE A
IDAHO FALLS, IDAHO 83402

REPLY TO
ATTENTION OF:

MIDDLE SNAKE RIVER AREA OFFICE
BOISE, IDAHO
RECEIVED
JAN 28 10

January 25, 2010

Regulatory Division

SUBJECT: NWW-2007-00397-I01

Ms. Allyn Meuleman
U.S. Bureau of Reclamation
230 Collins Road
Boise, Idaho 83702-4520

Dear Ms. Meuleman:

This is in response to your letter of November 30, 2009 requesting our comments on the Minidoka Dam Spillway Replacement Draft Environmental Impact Statement. The project is located on Lake Walcott, Idaho at the Minidoka Dam Spillway in Minidoka and Cassia Counties, Idaho.

Regarding our regulatory responsibilities, Section 404 of the Clean Water Act (33 U.S.C. 1344) requires a Department of the Army permit be obtained for the discharge of dredged or fill material into waters of the United States. This includes most perennial and intermittent rivers and streams, natural and man-made lakes and ponds, and wetlands, as well as irrigation and drainage canals and ditches that are tributaries to other waters. Activities regulated under Section 404 include excavation and mechanized landclearing activities that result in the discharge of dredged material and destroy or degrade waters of the United States. The term waters of the United States include rivers, lakes, streams, (both perennial and intermittent), ponds, and wetlands.

Based on the information provided, it appears that the proposed project will involve work in areas subject to our jurisdiction. You should have these areas identified and delineated and submitted for our review and approval. COE-01

If the proposed project will involve the discharge of dredged or fill material in waters of the United States, including wetlands, a Department of the Army permit may be required prior to the start of construction. If so, you will need to complete and submit a permit application for processing and evaluation. COE-02

With regards to the Draft Environmental Impact Statement we have comments/concerns as show below:

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1. We would recommend that you enumerate and/or better develop alternatives eliminated from further consideration and explain why they were eliminated. The Draft EIS indicates that over 50 alternatives were considered and eliminated for a number of reasons, but there is no detail concerning what alternatives were evaluated, why they were eliminated, etc. To function as a disclosure document we feel that the EIS needs to include this information. COE-03
2. We would recommend that you provide additional detail and/or a delineation map of the existing aquatic resources, including wetlands and then indicate what resource areas would be affected/impacted by each of the alternatives. COE-04
3. We would recommend that you develop/include at least a preliminary compensatory mitigation plan for unavoidable impacts to aquatic resources associated with the project. How do you intend to replace lost and/or impacted functions to aquatic resources, including wetlands, that result from the project? COE-05

If you have any questions concerning these regulatory matters, please feel free to contact me at 208-522-1676.

Sincerely,

James M. Joyner

James M. Joyner
Regulatory Project Manager

BPA

Meuleman, Allyn G

From: Pierce,Kathy - KEC-4 [kspierce@bpa.gov]
nt: Monday, February 22, 2010 1:49 PM
Meuleman, Allyn G
: Pendergrass,Richard M - PGP-5; Fodrea,Kimberly A - PGPL-5; Johnson,Yvonne E - KEC-4
Subject: Minidoka Dam EIS Comments
Attachments: MiniD_Results_MW_$.xls

BPA has two comments of the U.S. Bureau of Reclamation's Minidoka Dam Spillway Replacement Draft EIS. Our comments concern spillway replacement and pool raise.

1. While the spillway replacement will allow the pool to be higher in the winter, and create head benefits at the project, the project operation of October draft and November refill will likely cause power losses downstream. The attached study estimates those costs at:

- $200,000 dollars for the spillway replacement operation, and
- $600,000 dollars with the spillway replacement and pool raise operation.

Please include downstream power losses in your analysis. BPA 01

2. These alternatives have a proposed operation that drafts the project in October and refills in November. Please include alternatives that use flexibility for draft and fill of the pool across the October through March time frames. BPA 02

Thank you for accommodating our request for additional time to formulate our comments. Please let me know if you would like me to follow up with a comment letter.

thy Pierce, NEPA Compliance Officer
neville Power Administration
3-230-3962

Summary of Minidoka Study : Federal Power Impacts

All values are relative to BPA Base Case (08_RateCase10_final)
All values are 70-year average

Brownlee Inflow Adjustment, cfs

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Apr	May	Jun	Jul	Aug	Aug	Sep
Spillway Replacement	**0**	-493	-2	-72	-80	**517**	**98**	**98**	-3	-1	-1	0	0	**1**
SpillwayReplace + PoolRaise	**11**	-581	-8	-233	-85	**524**	**57**	**57**	**284**	-144	**11**	-6	-6	**15**
PoolRaise-Case1	**39**	-567	**9**	-257	-93	**519**	**36**	**36**	**258**	-184	**51**	**47**	**47**	**64**
PoolRaise-Case2	**42**	-564	**11**	-258	-92	**518**	**36**	**36**	**258**	-186	**53**	**44**	**44**	**66**

Federal Generation, aMW

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Apr	May	Jun	Jul	Aug	Aug	Sep	**Avg**
Spillway Replacement	-11	-10	-2	-3	-3	**15**	**4**	**6**	**1**	**1**	0	0	0	**0**	**0**
SpillwayReplace + PoolRaise	-11	-13	-3	-9	-5	**15**	**2**	**5**	**4**	0	-1	0	0	**1**	**-1**
PoolRaise-Case1	-9	-13	-2	-10	-6	**14**	**2**	**5**	**4**	-1	**1**	**2**	**2**	**3**	**-1**
PoolRaise-Case2	-9	-13	-2	-10	-5	**14**	**2**	**5**	**4**	-1	**1**	**1**	**2**	**3**	**-1**

Federal Revenues, millions $ (2010)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Apr	May	Jun	Jul	Aug	Aug	Sep	**Sum**
Spillway Replacement	-$0.3	-$0.3	-$0.1	-$0.1	-$0.1	**$0.5**	**$0.1**	**$0.1**	**$0.0**	**$0.0**	$0.0	**$0.0**	$0.0	**$0.0**	**-$0.2**
SpillwayReplace + PoolRaise	-$0.3	-$0.4	-$0.1	-$0.3	-$0.1	**$0.5**	**$0.0**	**$0.1**	**$0.1**	**$0.0**	$0.0	$0.0	**$0.0**	**$0.0**	**-$0.6**
PoolRaise-Case1	-$0.3	-$0.4	-$0.1	-$0.3	-$0.2	**$0.4**	**$0.0**	**$0.1**	**$0.1**	$0.0	**$0.0**	**$0.0**	**$0.0**	**$0.1**	**-$0.4**
PoolRaise-Case2	-$0.3	-$0.4	-$0.1	-$0.3	-$0.2	**$0.4**	**$0.0**	**$0.1**	**$0.1**	$0.0	**$0.0**	**$0.0**	**$0.0**	**$0.1**	**-$0.4**

IDFG

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IDAHO DEPARTMENT OF FISH AND GAME
MAGIC VALLEY REGION
324 South 417 East, Suite 1
Jerome, Idaho 83338

C.L. "Butch" Otter / Governor
Cal Groen / Director

February 4, 2010

Allyn Meuleman, Activity Manager
Bureau of Reclamation
230 Collins Road
Boise, ID 83702-4520

RE: Minidoka Dam Spillway Replacement Draft Environmental Impact Statement

Dear ~~Ms Meuleman:~~ Allyn:

Idaho Department of Fish and Game (Department) staff has reviewed the Minidoka Dam Spillway Replacement Draft Environmental Impact Statement (DEIS) for the Minidoka Project. The DEIS proposes two action alternatives: 1) total replacement of the 2,000 ft long concrete spillway and Northside and Southside canal head gates and 2) replacement of the spillway only. The purpose and need for the proposed action is the potential for partial or complete failure of the existing spillway and head gates.

The Department offers comments and evaluation of the proposed action alternatives with the knowledge the Minidoka Dam Spillway Replacement Project offers an opportunity for the Bureau of Reclamation (BOR) to solidify its contractual obligations for water delivery, power generation, and commitments to provide flow augmentation water under the Nez Perce Settlement Agreement and the Upper Snake River BiOp. A partial or complete failure of the spillway or canal headworks could threaten BOR's ability to meet these obligations. We are interested in implementing the project in a manner that effectively eliminates or reduces and mitigates any impacts the project might have on Idaho's wildlife resources and recreation, while still meeting BOR's commitments.

The Department, acting under supervision of the Idaho Fish and Game Commission, is charged with the statutory responsibility to preserve, protect, perpetuate, and manage all fish and wildlife in Idaho (Idaho Code § 36-103(a)). As such, we recommend fish and wildlife receive equitable consideration with other resources in decisions affecting land and water management. Resident species of fish and wildlife are the property of all citizens within the state (Idaho Code § 36-103(a)) and decisions affecting fish and wildlife therefore are the concern of all Idahoans. IDFG 01

The Department maintains management authority for fish and wildlife in and around Minidoka Dam and Lake Walcott. Although site-specific information on certain fish and wildlife populations within the project area may be limited, we do have species management plans for the area encompassing the dam and reservoir. We request consideration be given to our species management plans and goals/objectives for the management units and zones found within the planning area boundaries. Species management plans covering this area are available for fish, IDFG 02

mule deer, pronghorn, sage-grouse, waterfowl, and pelicans. Species management plans can be found on the Department's website at: http://fishandgame.idaho.gov/.

A number of species of conservation concern are found in and around Minidoka Dam and Lake Walcott. In 2005, the Department completed the Idaho Comprehensive Wildlife Conservation Strategy (CWCS). The strategy identifies 229 species of greatest conservation need (SGCN) in Idaho and establishes an ecological, habitat-based framework to aid in the conservation and management of these species. The strategy provides recommendations for actions to improve the population status and habitat conditions of SGCN, and describes an approach for long-term monitoring. We recommend full identification and evaluation of any direct and indirect effects on SGCN that potentially occur within the affected area. Most of these species were previously identified in our scoping comments (see attached map). An electronic copy of the CWCS is available on the Department's website at: http://fishandgame.idaho.gov/cms/tech/CDC/cwcs_table_of_contents.cfm. IDFG 03

Although not thoroughly detailed in the DEIS, Department staff have participated directly and indirectly in a variety of capacities during development of the DEIS including participation in informal technical team meetings and tours of the project, fish and wildlife data collection and dissemination, interagency meetings, and submission of formal comments through scoping. As such, the Department has extensive and explicit knowledge of potentially affected resources related to the proposed action alternatives.

We offer comment on the proposed action and DEIS at two levels: 1) over-arching concerns with the proposed action including proposed modifications to spillway flow regimes and proposed operational changes in reservoir water level management and 2) recommended edits, clarifications, and/or additions to specific items or sections within the draft document.

General Comments

Spillway Flows

Spillway flows below Minidoka Dam once supported a relatively small but locally popular sport fishery for rainbow trout, smallmouth bass, and other fish species. The spillway flows also support an assortment of seasonally flooded and permanent wetland areas which provide important habitat for a variety of waterfowl, shorebirds, wading birds, song birds, and other wetland dependent wildlife. Prior to implementation of the Minidoka Powerplant Replacement Project, including construction of the Inman Powerplant in 1997, 4,000-5,000 cfs was commonly passed through the spillway during project operations.

In response to the powerplant replacement project proposal, BOR commissioned a study by the University of Idaho to determine the minimum discharge needed to maintain the spillway fishery (Hiebert and Bjornn 1980, BOR 1991). Specifically, these flow levels were needed to provide adequate amounts of fish habitat, good access to fishing areas, and prevent summer temperature increases (Hiebert and Bjornn 1980). As a result, project operations following construction of the Inman Powerplant require BOR to release flows of 1,300 cfs from April 15 through June 30; 1,900 cfs from July 1 to August 31; and 1,300 cfs from September 1 through September 15 to

maintain the spillway fishery (BOR 1991, BOR 1997). In addition, wetland ponds were constructed to mitigate losses associated with decreased spillway flows (BOR 1991).

The DEIS proposes to dramatically reduce spillway flows from those determined by Hiebert and Bjorn (1980) to be the minimum needed to sustain a fishery. Rationale or justification for the reduced flows are not directly provided in the DEIS. The DEIS portrays the current spillway flow regime as mitigation for construction of the Inman Powerplant under the assumption that flows would lower water temperatures (Section 3.6.1, page 101, paragraph 4) and implies the current flow regime was not successful in reducing water temperatures.

The recreational potential associated with fish and wildlife residing in the spillway has been sequentially diminished when considered over the past 30 years. Recommended flows in the spillway seem designed to address ESA related needs while providing creative but unproven attempts to preserve the consumptive and non-consumptive recreational opportunities related to fish and wildlife residing there. We are concerned the proposed spillway management discounts creditable research and puts forth untested recommendations without a firm commitment to consider reverting to the previously documented minimum flows needed to sustain a fishery. As such, we recommend the final environmental impact statement (FEIS) 1) provide additional documentation and/or rationale to justify the proposed reduction in flow over the spillway, 2) establish a rigorous monitoring program to identify potential project related affects, 3) link monitoring results to a commitment to consider changes in project operations, including but not limited to, increased flows to reduce and/or mitigate project related effects, and 4) identify habitat-based mitigation for lost fishing opportunity in the event project operations cannot be modified to maintain/improve the fishery. IDFG 04

Reservoir Water Level Management

Lake Walcott supports a popular sport fishery for trout and smallmouth bass. The DEIS generally provided an accurate depiction of the sport fishery, including the expansion and popularity of the smallmouth bass population (Section 3.6, pages 88-99). Current reservoir operations include an annual 4-5 month drawdown. Annual winter drawdown of the reservoir can negatively affect juvenile fish by reducing the availability of hiding cover and increasing predation rates. We expect the proposal to decrease drawdown duration to result in more favorable conditions for the Lake Walcott smallmouth bass population; however, the degree of benefit is unknown and should be evaluated. IDFG 05

The reservoir and existing spillway support a wide variety of birds including large numbers of waterfowl, shorebirds, and wading birds. The DEIS provided an adequate depiction of current bird use of the reservoir (and associated habitats) including annual waterfowl and colonial nesting bird production, use by migrating waterfowl, shorebirds, and wading birds, and winter waterfowl use (Section 3.7, pages 125-128). The Minidoka Refuge, encompassing 20,699 acres of open water (Lake Walcott), riverine, and adjacent upland habitats, has been designated as an Important Bird Area (IBA) of global importance for its colonial nesting bird populations and numbers of molting waterfowl.

Aquatic macrophytes provide important food and cover resources for water dependent birds. As noted in the DEIS, changes in water level management and a ~70% reduction in the period of

reservoir drawdown could affect the abundance and distribution of preferred/key waterfowl forage plants (Section 3.7.2, page 135-136, paragraph 6) and favor establishment of invasive species like Eurasian milfoil (Appendix E, page 1, paragraph 2). Despite the area's local and regional importance for breeding, migrating, and wintering waterfowl and acknowledgement in the DEIS that the refuge is globally important for molting waterfowl, we believe the treatment of potential effects was inconsistent and incomplete for tundra and trumpeter swans (Section 3.7, page 137, paragraphs 2 and 3) and completely absent for waterfowl.

We recommend the FEIS include a thorough analysis of the potential impacts of changes in reservoir water level management on water dependent birds. We support actions identified in the DEIS to monitor aquatic vegetation to determine if operational changes affect vegetation (Section 3.7.4, page 147, paragraph 1) and subsequent water dependent bird species diversity, abundance, and distribution. Further, the FEIS should clearly identify management actions to improve conditions in the event impacts are documented including, but not limited to, periodic longer-term drawdown (Appendix E, page 1, paragraph 2) to improve conditions for preferred aquatic macrophyte production and prevent establishment of invasive aquatic species. IDFG 06

Specific Comments

Section 3.2.4, page 64, paragraph 2 – Mitigation discussion for Hydrology and Reservoir Operations focuses heavily on projected benefits of modified spillway flows to ESA listed snails and trout with no supporting documentation, data, or discussion of these issues in the Affected Environment section. The DEIS failed to make the link between changes in hydrology and reservoir operations and the mitigation prescribed in this paragraph. This discussion is more appropriate in the Aquatic and Terrestrial Biota sections. IDFG 07

Section 3.6.1, page 88, paragraph 1 – Characterization of the reservoir fishery in this paragraph is misleading. While fishing pressure on Lake Walcott is "light" compared to other highly popular fisheries in southern Idaho, it does offer unique and rare fishing opportunities from a regional perspective. The paragraph should be amended to reflect the status of the fishery from a regional perspective. IDFG 08

Section 3.6.1, page 99, paragraph 3 – Canal entrainment discussion relies on anecdotal information. We recommend reviewing Partridge et al. (1990) and Hiebert and Bjornn (1980) to better describe and quantify the issue of canal entrainment in the FEIS. IDFG 09

Section 3.6.2, page 111, paragraph 6 – Discussion of fish entrainment under both action alternatives assumes entrainment rates via strategically located pipes will be similar to those provided by existing radial gates. We are unaware of any peer-reviewed research or other documentation supporting this assumption. We suggest the FEIS include monitoring of fish entrainment rates as mitigation. Further, the FEIS should clearly identify management actions to improve conditions in the event entrainment occurs at rates lower than anticipated (i.e., below rates provided by existing radial gates). Actions should include, but not be limited to, use of radial gates to provide spillway flows. IDFG 10

Section 3.6.2, page 112, paragraph 3 – Discussion of reduced spillway flows and temperature is based on an assumption that existing spillway flows were intended to lower water temperatures. As discussed previously, this is inaccurate. Existing flows were intended to maintain fish habitat and fisherman access and prevent increased water temperature during the summer. The DEIS failed to demonstrate that decreased spillway flows will maintain or improve current conditions. In addition, under current project operations, fish refuge is provided by oxygen-saturated water discharged immediately below the spillway during stressful summer months. The proposed use of pipes to deliver spillway flows could eliminate this important habitat component likely resulting in fish mortality. We recommend the FEIS ensure flows are provided in a manner conducive to oxygenating spillway discharge. IDFG 11

Section 3.6.3, page 116, paragraph 5 – Similar to the previous comment, reference to improved aquatic conditions in the spillway appear to be based on faulty assumptions and an unsupported analysis. IDFG 12

Section 3.7.1, page 119, paragraph 4 – Russian olive, as defined by the State of Idaho, is not a noxious weed. The noxious weed list for Idaho can be found at: http://www.idahoag.us/Categories/PlantsInsects/NoxiousWeeds/watchlist.php. IDFG 13

Section 3.7.2, page 134, paragraph 2 – DEIS states "*Higher pools and more subsurface flow during the winter would likely not affect the existing vegetation much.*" The word "much" is a vague term and effects should be quantified from a loss of vegetation perspective. IDFG 14

Section 3.7.2, page 137, paragraph 1 – Discussion of potential effects to Tundra Swans contradicts the previous discussion in Section 3.7.2 (page 135-136, paragraph 6) which suggests changes in water level management would probably result in a decline of sago pondweed, a preferred waterfowl forage plant. The decline of forage resources has the potential to negatively affect Tundra Swans. IDFG 15

Section 3.7.2, page 139, paragraph 2 – Discussion of the relative density of riparian dependent and wetland vegetation in the spillway from a per unit area perspective is not the proper context for this analysis. Specifically, riparian dependent and wetland vegetation in the spillway is distributed in clusters or pockets based on soils and water availability. These "clusters" of vegetation can provide important habitat for a variety of wetland/riparian dependent wildlife. IDFG 16

Section 3.7.2, page 139, paragraph 3 – The paragraph states "*...the extent of the wetlands would not significantly change when compared to the No Action Alternative...*" which implies data was available for statistical analysis. No data or analysis were provided in the DEIS supporting this statement. IDFG 17

Section 3.7.2, page 139, paragraph 5 – Discussion states "*...releases through the new spillway would be about the same.*" This statement is contradictory to the proposed 62-74% reduction in existing minimum spillway flows. IDFG 18

Section 3.7.2, page 139, paragraph 5 – The paragraph states "*Distribution changes of water out-flow...would displace avian species for a period of time but they should respond without any affects (sic).*" The "act" of displacement is an effect and should be analyzed. IDFG 19

Section 3.7.2, page 139, paragraph 5 – Discussion acknowledges a portion of habitat (presumably riparian/semi-permanent wetland habitat) would be lost but suggests the new spillway would *enhance* avian habitat over time because of more stable flows. It is unclear from the DEIS how the loss of habitat and reduction in spillway flows would *enhance* avian habitat. IDFG 20

Section 3.7.2, page 141-142, paragraph 6 – Discussion acknowledges reptile and amphibian habitat would be lost but suggests the new spillway and proposed spillway flows would *enhance* habitat over time. The DEIS does not describe how loss of habitat and reduction in spillway flows would *enhance* reptile and amphibian habitat. Further, this section states the loss of habitat would have minimal impacts to reptiles and amphibians because they are mobile and terrestrial. This statement assumes suitable, unoccupied, and accessible habitat exists in relative close proximity to the spillway. We are unaware these conditions occur. IDFG 21

Section 3.7.3, page 146, paragraph 1 – A sizeable portion of the discussion in this section focuses on fish management which would be more appropriately discussed in the Aquatic Biota section. IDFG 22

Section 3.7.3, page 146, paragraph 1 – Section states "*According to USFWS documentation, there are not many avian species that use the reservoir during the winter but waterfowl that use the exposed islands will be forced to find new places to loaf, most likely American Falls Reservoir.*" We suggest this statement warrants further clarification and analysis on several levels in the FEIS including 1) a citation for the referenced documentation, 2) the effects of displacing wintering waterfowl from the refuge to other locals, and 3) the loss of hunting opportunity resulting from the displacement of waterfowl. Further, this statement implies suitable, unoccupied, and accessible loafing habitat exists on American Falls Reservoir. We are unaware these conditions exist. IDFG 23

Section 3.7.3, page 146, paragraph 2 – The Department has no plans to manage pelican numbers on Lake Walcott at this time. We recommend reviewing the Department's management plan for pelicans (http://fishandgame.idaho.gov/cms/wildlife/plans/pelican.pdf). IDFG 24

Section 3.7.4, page 147, paragraph 4 – Section acknowledges the velocity of water moving through wetlands may affect wetland function and indicates monitoring will be conducted to determine effects. We suggest any change in wetland function has the potential to affect wetland dependent wildlife. We support the proposed wetland monitoring and recommend the FEIS identify future management actions to improve conditions in the event changes in wetland function occur. IDFG 25

Section 3.8.1, Bald Eagles, pages 155-157 – Discussion of bald eagle productivity and seasonal distribution throughout the Pacific Bald Eagle Recovery Area is based on outdated information. We recommend reviewing Steenhof et al. (2008) and IDFG (2010, *in press*) for more current information on the seasonal distribution and abundance of bald eagles in and around the project area. IDFG 26

Section 3.8.1, page 158, paragraph 1 – Discussion of yellow-billed cuckoos in Idaho is based on outdated and incomplete information. We previously provided BOR staff a map depicting the observations of cuckoos in and around the Minidoka Project during scoping (see attached map). We have included more detailed information on individual observations in the attached map and summary table. IDFG 27

Section 3.8.1, page 158, paragraph 1 – Discussion of the potential availability of suitable cuckoo habitat refers to dense riparian vegetation in the existing spillway. This section contradicts the characterization of riparian vegetation in the spillway in Section 3.7.2, page 139, paragraph 2. IDFG 28

Section 3.8.2, pages 162-163, paragraph 3 – Discussion of the potential spillway flow scenario under the action alternatives indicates "*average monthly flows through the spillway during the irrigation season are typically higher*" but provide no reference or source for this information. IDFG 29

Section 3.8.2, pages 169, paragraph 2 – Discussion of spillway flows under the action alternatives suggests foraging opportunities for bald eagles would remain unchanged. This claim is based on the assumption that fish are entrained at the same rates under all alternatives. As noted previously, the DEIS does not reference any peer-reviewed research or other documentation supporting the assumption that entrainment rates via strategically located pipes will be similar to those provided by existing radial gates. We reiterate the FEIS should include monitoring of fish entrainment rates and should clearly identify management actions to improve conditions in the event entrainment occurs at rates lower than anticipated (i.e., below rates provided by existing radial gates). Actions should include, but not be limited to, use of radial gates to provide spillway flows. IDFG 30

Section 3.8.2, pages 171, paragraph 1 – The statement "*Yellow-billed cuckoos have never been documented in the area of impact*" is incorrect. Cuckoos have been observed in the spillway and along the reservoir near Walcott Park from May through August in 1978, 1984, 1985, and 2005 (see attached map and summary table). The analysis of impacts to cuckoos needs to be reevaluated. IDFG 31

Section 3.13, Recreation, entire section – Hunting is not addressed. At a minimum, thousands of ducks and geese that annually winter on Lake Walcott provide ample on- and off-site recreational opportunity for resident and nonresident waterfowl hunters. As noted previously, changes in reservoir water level management have the potential to directly affect waterfowl abundance and distribution. Any effects to waterfowl will affect waterfowl hunting opportunity. The FEIS should include discussions of hunting in the Affected Environment section and address the potential effects of the action alternatives in the Environmental Consequences section. IDFG 32

Section 3.13, Recreation, entire section – This is the only section in the entire DEIS that focuses considerable attention to the area "below the dam" in addition to the spillway and reservoir. This inconsistent treatment should be rectified in the FEIS. IDFG 33

Section 3.13.1, page 196, paragraph 6 – Discussion suggests hunting is "*not popular*" in the area below the dam but provides no source or context for this information. IDFG 34

Section 3.12.2, page 204, paragraph 5 – As noted in previous sections, ice and spring fishing are popular recreational activities above Minidoka Dam, particularly above the south end of the spillway. The discussion acknowledges loss of angler use of the new spillway to access the reservoir. Further, no legal access exists on the unimproved road south of the Southside Canal. We recommend BOR explore the potential for a public easement to access the southern portions of the reservoir as mitigation for lost access opportunities associated with the proposed action alternatives. IDFG 35

Section 3.13.2, page 207, paragraph 5 – Discussion suggests excavation for the installation of new radial gates in concert with the new piped spillway flows will enhance fish habitat and may improve the quality of fishing below the new spillway. These statements are not supported by data and analysis in the DEIS. We recommend the FEIS include such an analysis. We also recommend monitoring of fish entrainment rates, fish habitat, and angler use and success. Further, the FEIS should clearly identify management actions to improve entrainment rates and habitat in the event either falls below existing conditions. Actions should include, but not be limited to, use of radial gates to provide spillway flows greater than the proposed 500 cfs up to those recommend by Hiebert and Bjornn (1980). IDFG 36

Canal Entrainment

Fish are entrained into both the Northside and Southside canals. Entrained sportfish species include white sturgeon, rainbow trout, smallmouth bass, and yellow perch. Partridge et al. (1990) and Hiebert and Bjornn (1980) documented entrainment of stocked hatchery rainbow trout. In past years, BOR personnel have worked with the Department to return entrained sturgeon back to Lake Walcott.

The Department recognizes that implementation of either action alternative is not likely to substantially change the amount of entrainment that currently occurs. However, sportfish entrained into the spillway and canals are currently available to Idaho sportsman because there is existing access to both canals and the spillway across BOR property. As described in the DEIS, implementation of either action alternative will restrict access to these popular fishing areas and eliminate the opportunity to harvest and salvage these entrained fish.

The Department and BOR representatives participated in pre-DEIS meetings where options related to entrainment were discussed. These options ranged from deflecting entrained fish into the spillway (provided public access was provided) to complete barriers. In most instances, options to prevent or reduce fish entrainment into the canals were deemed cost prohibitive.

The Department does not have specific data that demonstrates a major population level impact associated with existing canal entrainment; however, it seems prudent to consider future entrainment concerns given the term and scope of the proposed rebuild outlined in Alternative B in the DEIS. The complete retrofitting of entrainment infrastructure (e.g., power, foundation needs, etc.) on preexisting headgates would likely be more costly than if the new headgate designs incorporated features compatible with future entrainment infrastructure installation.

We recommend the FEIS evaluate fish screen and other entrainment deterrent options and consider incorporating infrastructure features into the design of the new canal headgates. This would allow a cost-effective and timely response in the event a future mandated need arises. IDFG 37

Technical Team

On January 14, representatives from the USFWS, BOR, and Department met on-site to tour the spillway and discuss the proposed action alternatives. A focal point of discussion centered on the feasibility and utility of establishing a technical team of agency biologists to: 1) assist BOR in assessing the effects of the proposed project on fish and wildlife populations and habitat and 2) identify, implement, and monitor strategies to reduce or eliminate effects. During discussions BOR personnel clearly articulated that contractual obligations for water delivery, power, and ESA species were overwhelming priorities for the Minidoka Project. Further, it was unclear whether future obligations for the project would preclude opportunities to avoid, minimize, or mitigate effects to Idaho's fish and wildlife resources and recreation. Our staff will need to evaluate whether participation on a technical team will provide the Department a meaningful opportunity to collaborate with BOR to implement changes in project operations or other proactive measures in the event the proposed project has deleterious effects on fish and wildlife resources and related recreation. IDFG 38

Thank you for the opportunity to review the Minidoka Dam Spillway Replacement DEIS. If you have any questions please contact Mike McDonald, Environmental Staff Biologist, or Doug Megargle, Regional Fish Manager, at this office.

Sincerely,

H. Jerome Hansen

H. Jerome Hansen
Magic Valley Regional Supervisor

Cc: USFWS - Boise (Dwayne Winslow/Mark Robertson)
USFWS - Chubbuck (Tracy Casselman/Mike Fisher)
USFWS - Minidoka NWR (Jeff Krueger)
Governor's Office - Bonnie Butler
IDFG - Boise (Hebdon/Robertson/Grunder/Kiefer)
IDFG - Pocatello (Mende/Teuscher)
IDFG - R4 staff

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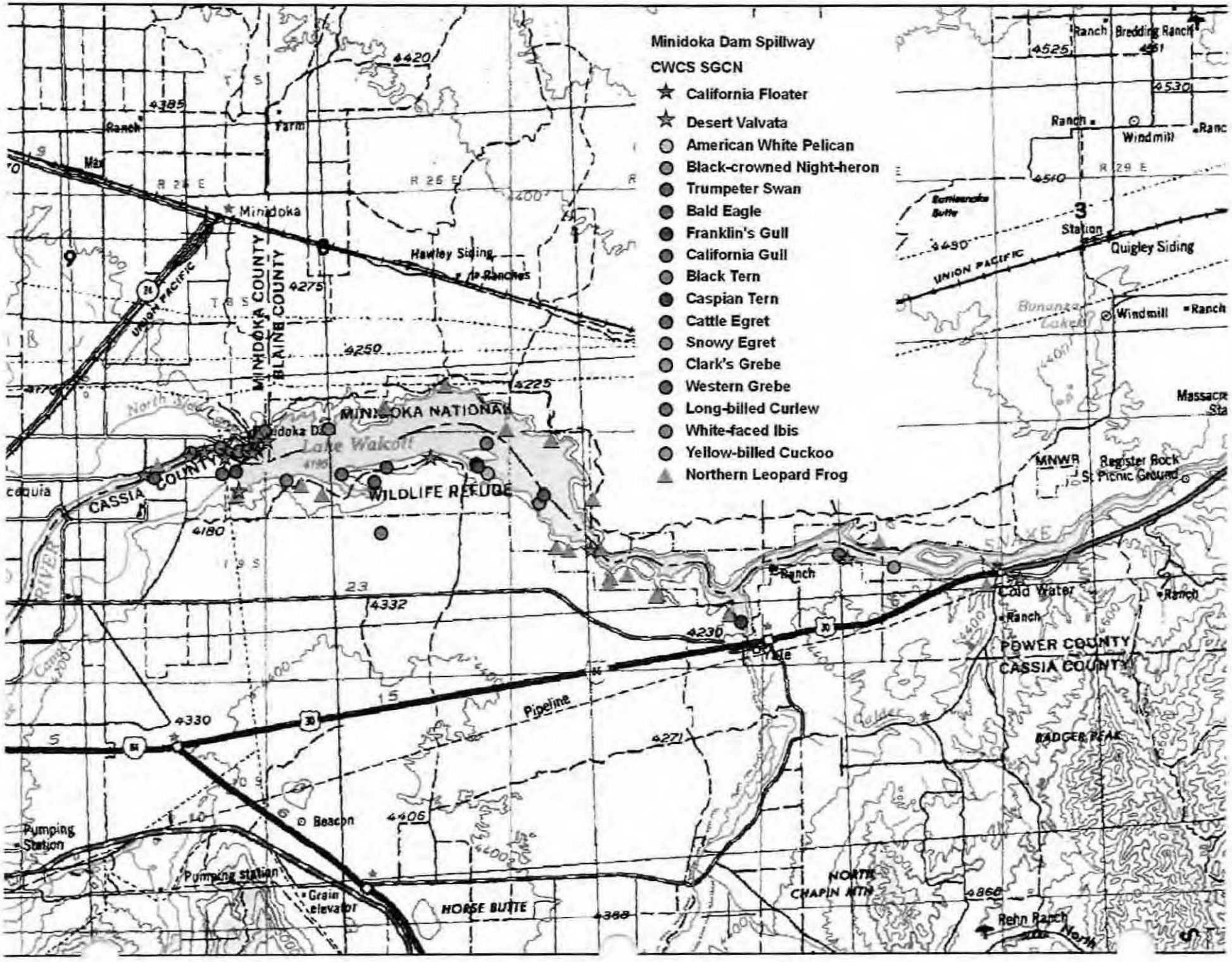
Minidoka Dam Spillway
CWCS SGCN
California Floater
Desert Valvata
American White Pelican
Black-crowned Night-heron
Trumpeter Swan
Bald Eagle
Franklin's Gull
California Gull
Black Tern
Caspian Tern
Cattle Egret
Snowy Egret
Clark's Grebe
Western Grebe
Long-billed Curlew
White-faced Ibis
Yellow-billed Cuckoo
Northern Leopard Frog
Minidoka
Hawley Siding
MINIDOKA COUNTY
BLAINE COUNTY
UNION PACIFIC
MINIDOKA NATIONAL
WILDLIFE REFUGE
Lake Walcott
CASSIA COUNTY
POWER COUNTY
Pipeline
Beacon
Pumping Station
Grain elevator
HORSE BUTTE
NORTH CHAPIN MTN
BADGER PEAK
Cold Water
Ranch
Windmill
Quigley Siding
Station
Bonneville Butte
Bonanza Lakes
MNWR
Register Rock
Picnic Ground
Massacre Sta
Bredding Ranch
Rehn Ranch
Farm
Max
Cassia
SNAKE
RIVER
North Side
Canal
Golden
R 26 E
R 25 E
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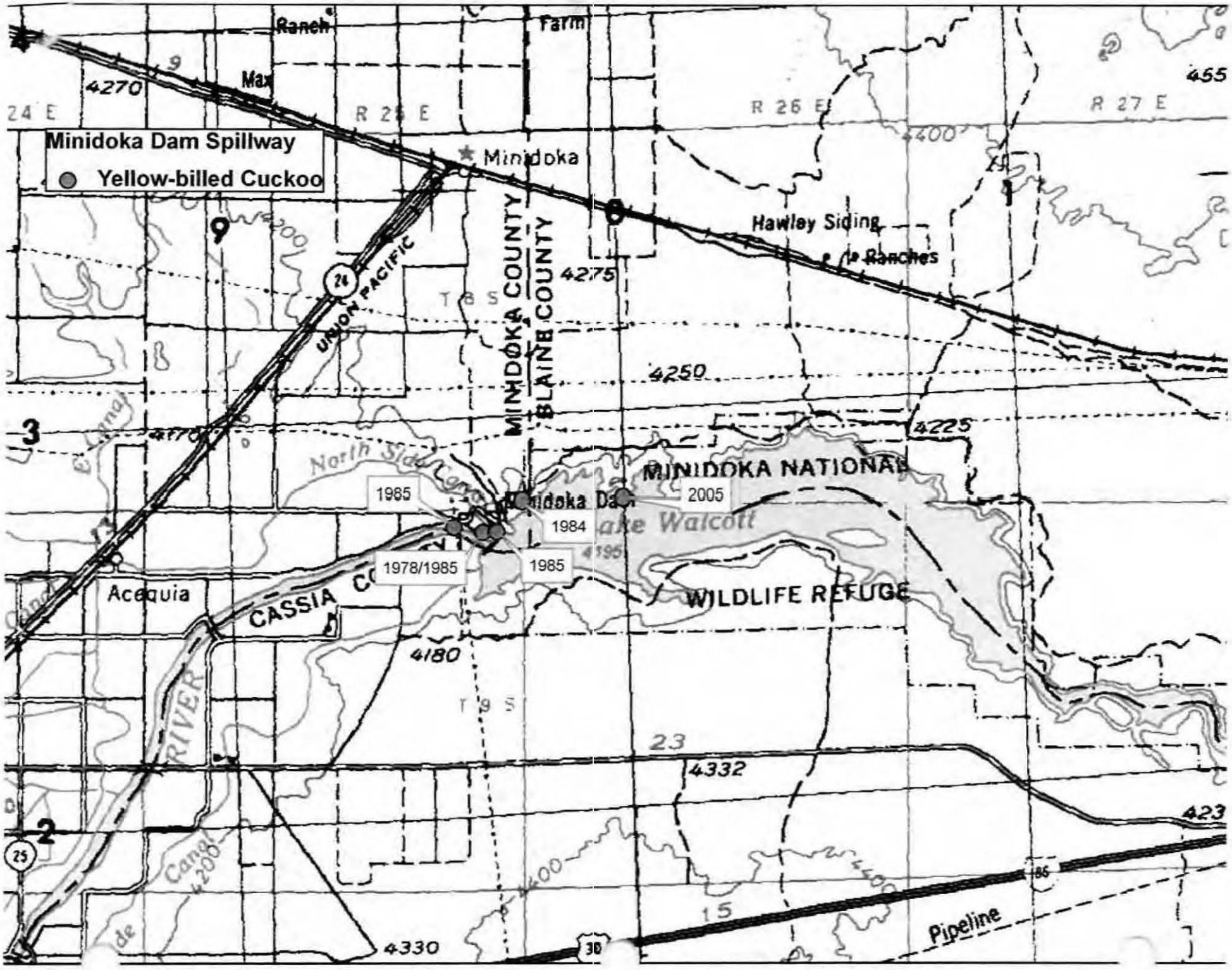
Minidoka Dam Spillway
Yellow-billed Cuckoo
Ranch
Farm
Max
Minidoka
Hawley Siding
Ranches
UNION PACIFIC
MINIDOKA COUNTY
BLAINE COUNTY
MINIDOKA NATIONAL
WILDLIFE REFUGE
Lake Walcott
Minidoka Dam
North Side Canal
Acequia
CASSIA CO
RIVER
Canal
Pipeline
R 24 E
R 25 E
R 26 E
R 27 E
T 8 S
T 9 S
4270
4275
4250
4225
4180
4332
4330
4400
4200
4195
455
423
1985
1984
1978/1985
1985
2005

Minidoka Dam Spillway Replacement
Draft Environmental Impact Statement
Yellow-billed Cuckoo Observations

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Inventory/Targeted Survey
DATA TYPE	Observed (seen)
Observer	Bouffard, Stephen H. or Steve H.
OBS BACK	Biologist, researcher, or taxa expert.
IDTM83 E	2545689
IDTM83 N	1275651
LOC ACC	Very Good (within 400 m of the actual site). GPS coordinates of unknown accuracy, 1/4 sections, and similar data.
LOC DIR	Minidoka National Wildlife Refuge. Cassia County.
MONTH	5
DAY	25
YEAR	2005
COUNT	1

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Incidental Observation
DATA TYPE	Observed (seen)
Observer	Struthers, Kit
OBS BACK	Citizen Scientist, working in the capacity of a biologist under supervision.
IDTM83 E	2543162
IDTM83 N	1275564
LOC ACC	Very Good (within 400 m of the actual site). GPS coordinates of unknown accuracy, 1/4 sections, and similar data.
LOC COMM	Location is a best estimate based on available data (Reynolds, Timothy D. 2004).
LOC DIR	Minidoka WMA.
MONTH	6
DAY	24
YEAR	1984
COUNT	1

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Incidental Observation
DATA TYPE	Observed (seen)
Observer	Struthers, Kathleen
OBS BACK	Citizen Scientist, working in the capacity of a biologist under supervision.
IDTM83 E	2542516
IDTM83 N	1274796
LOC ACC	General Area, vague or problematic data; Use of a town or prominent landmark in historical data.
LOC DIR	Minidoka National Wildlife Refuge
MONTH	6
DAY	29
YEAR	1985
COUNT	1

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Incidental Observation
DATA TYPE	Examined in hand or at close range
Observer	Hill, John D.
OBS BACK	Biologist, researcher, or taxa expert.
IDTM83 E	2542155
IDTM83 N	1274777
LOC ACC	Fair (within 1 km of the actual site). Township, range, section, or moderately detailed directions, etc.
LOC DIR	Minidoka National Wildlife Refuge, Snake River
MONTH	6
DAY	12
YEAR	1985
COUNT	1

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Incidental Observation
DATA TYPE	Examined in hand or at close range
Observer	Hill, John D.
OBS BACK	Biologist, researcher, or taxa expert.
IDTM83 E	2542155
IDTM83 N	1274777
LOC ACC	Fair (within 1 km of the actual site). Township, range, section, or moderately detailed directions, etc.
LOC DIR	Minidoka National Wildlife Refuge, Snake River
MONTH	7
DAY	2
YEAR	1978
COUNT	1

SCI NAME	*Coccyzus americanus*
COM NAME	Yellow-billed Cuckoo
SURVMETH	Incidental Observation
DATA TYPE	Observed (seen)
Observer	Struthers, Kit
OBS BACK	Citizen Scientist, working in the capacity of a biologist under supervision.
IDTM83 E	2541426
IDTM83 N	1274905
LOC ACC	Very Good (within 400 m of the actual site). GPS coordinates of unknown accuracy, 1/4 sections, and similar data.
LOC COMM	Location is a best estimate based on available data (Reynolds, Timothy D. 2004).
LOC DIR	Minidoka WMA. South side of the River.
MONTH	6
DAY	29
YEAR	1985
COUNT	1

ISP

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Allyn Meuleman, Activity Manager
230 Collins Road
Boise, ID 83702-4520

Subject: Minidoka Dam Spillway Replacement DEIS comments

Dear Ms. Meuleman:

The Idaho Department of Parks and Recreation has reviewed the above referenced document for direct impact to Lake Walcott State Park, primarily, and for impacts to recreation in general on or adjacent to the reservoir.

Lake Walcott State Park

None of the proposed alternatives indicate there will be any impact to the park.

Alternative A (No Action)

If no action is taken, and the seasonal drawdown (elevation 4239.5 and 4240.5) is continued indefinitely, recreationists will continue to be effected by the negative impacts the protracted low pool has on fishing, boating, and winter use. Ultimately, deterioration of the spillway will be so severe that full replacement will be required; this will be disruptive to the recreationists. Maintaining the spillway in its current deteriorating shape is visually disturbing as the concrete is falling apart. This situation alarms the visitors and generates a lack of confidence for the overall safety of the facility. ISP-01

Alternative B (Preferred Alternative)

This alternative is the most advantageous for the recreating public. It will reduce the number of months each year that the reservoir is drawn down. Full pool (elevation 4245) in the reservoir is the most desirable scenario for water-based recreationists. It provides the best access to boat ramps and other facilities in the summer, and provides the safest ice conditions in the winter for ice fishing and other winter sports. ISP-02

This alternative eliminates access across the spillway, which is currently available. That inconvenience to the recreating public may be offset by the benefits gained from having the reservoir maintained at full pool (elevation 4245).

Replacement of the North Side Canal Headworks and South Side Canal Headworks at the same time that the spillway work is being conducted, and integrating the construction of the spillway with the South Side Canal Headworks, will cause the least amount of disruption for recreationist: it will be a one-time construction process.

Alternative C (Spillway Replacement)

Replacing the spillways without reworking the North Side Canal Headworks and South Side Canal Headworks, and without integrating the South Side Canal Headworks into the construction process, is a missed opportunity for construction and safety efficiency. ISP-03

IDPR supports Alternative B, the Preferred Alternative. Thank you for the opportunity to provide comments through your process. If you have any questions, please contact me by phone at 514-2482, or by email at mary.lucachick@idpr.idaho.gov.

Sincerely,

Mary Lucachick
Water Resource Analyst

cc: Lake Walcott State Park (T. Richardson)

IWUA

Meuleman, Allyn G

From: norm@iwua.org
Sent: Thursday, January 21, 2010 12:29 PM
To: Minidoka_dam_eis@pn.usbr.gov; Meuleman, Allyn G
Cc: Minidoka Irrigation District; Randy Bingham
Subject: Minidoka Dam Spillway Replacement Draft EIS

January 21, 2010

Allyn Meuleman, Activity Manager
Bureau of Reclamation
230 Collins Road
Boise, ID 83702-4520

Re: Minidoka Dam Spillway Replacement Draft EIS - Support for Alternative B

Dear Allyn:

The Idaho Water Users Association (IWUA) supports Alternative B in the Draft Environmental Impact Statement (DEIS) for Replacement of the Minidoka Dam Spillway. IWU 01

IWUA represents irrigated agriculture throughout Idaho, including both spaceholders in Minidoka Reservoir -- Minidoka Irrigation District and Burley Irrigation District. We support the Districts' cooperative efforts with the Bureau of Reclamation to replace the spillway and look forward to successful completion of the necessary work in a cost-effective manner for the Districts and the Bureau.

Please let us know if we can be of assistance or answer any questions.

Sincerely,

Norman M. Semanko
Executive Director & General Counsel
Idaho Water Users Association
1010 W. Jefferson St., Suite 101
Boise, ID 83702
(208) 344-6690
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FMID

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FREMONT- MADISON IRRIGATION DISTRICT

P.O. BOX 15
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PHONE: 208-624-3381 FAX: 208-624-3990
EMAIL: fmid@ida.net

February 1, 2010

Bureau of Reclamation
Snake River Area Office
Allyn Meuleman, Activity Manager
230 Collins Road
Boise, ID 83702-4520

Dear Mr. Meuleman:

Fremont-Madison Irrigation District supports the Bureau of Reclamation in its selection of Option B as the preferred alternative identified in the draft environmental impact statement for the replacement of the Minidoka Dam spillway and irrigation district headworks. Fremont-Madison is opposed to any efforts to install fish screens as part of the project.

FMID 01

Sincerely

Dale Swensen, Executive Director

BID

John A. Rosholt
Albert P. Barker
John K. Simpson
Travis L. Thompson
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Travis L. Thompson
tlt@idahowaters.com

February 3, 2010

VIA EMAIL ONLY: minidoka_dam_eis@usbr.gov

U.S. Bureau of Reclamation
Snake River Area Office
Allyn Meuleman, Activity Manager
230 Curtis Road
Boise, Idaho 83702-4250

Re: Burley Irrigation District Comments on *Draft EIS Minidoka Dam Spillway Replacement (Minidoka Project)*

Dear U.S. Bureau of Reclamation:

This firm represents the Burley Irrigation District (BID) on various matters. At its request we are submitting these comments on the *Draft EIS Minidoka Dam Spillway Replacement* (Draft EIS) issued by the U.S. Bureau of Reclamation (Reclamation) in December 2009.

First, BID supports Reclamation's preferred alternative (Alternative B – Spillway and Headworks Replacement). Since Reclamation has determined that the existing spillway must be replaced due to deteriorating concrete and prior damage, BID supports the proposed replacement pursuant to the design and location identified in the preferred alternative. BID supports the purpose of the action to prevent structural failure of the Minidoka Dam spillway and canal headworks to protect its landowners and their future water use on lands in Cassia County. In addition, detailed comments regarding specific portions of the Draft EIS are set forth below:

Chapter 1 Purpose and Need for Action

1.2 Purpose and Need

p. 1

Although BID recognizes that a viable spillway and canal headworks is necessary for Reclamation to meet contractual obligations to BID for water delivery and power generation,

BID does not agree that this action is needed for Reclamation to meet "commitments to provide flow augmentation water under the Nez Perce Settlement". The terms of the Nez Perce Water Rights Settlement Agreement do not require any specific action with respect to the Minidoka Dam spillway. Moreover, Reclamation's commitment to provide "flow augmentation" pursuant to that Agreement is not dependent upon the Minidoka Dam spillway or the actions contemplated in the Draft EIS. Accordingly, Reclamation should remove or clarify any references to the Nez Perce Water Rights Settlement Agreement in the Final EIS. BID-01

Chapter 2 Alternatives

2.3 Alternative B – Spillway and Headworks Replacement (Preferred Alternative)

p. 18

BID supports Reclamation's preferred alternative, including the proposed design and location of the new spillway and canal headworks. BID-02

p. 20

Reclamation states that "construction of the new overflow sections may reduce the current rate of structural leakage to the wetland" and proposes to construct "a total of five water release point features" to "satisfy post-construction wetland flow needs". BID disputes Reclamation's characterization of the historical structural leakage and the implication that these incidental wetlands somehow are entitled to, or require, future water flow. Although the existing spillway leaks water, the fact that it has not functioned as intended does not mean Reclamation has an obligation to deliver water to these "wetlands". Moreover, if such delivery of water could impact Reclamation's obligations to BID or other spaceholders with respect to water storage or generation of reserved power for use on the Minidoka Project, Reclamation should modify or eliminate the intended releases. Accordingly, BID requests Reclamation to reconsider its proposal to purposely provide water to "wetlands" that have historically relied upon leakage from the existing spillway. BID-03

2.3.7 Construction

p. 26

Reclamation indicates that the contractor would need to build a "crossing over the South Side Canal" in order to utilize the proposed "staging/waste area". Since BID holds legal title to the canal, Reclamation should clarify that any crossings or use of BID property must be acquired by agreement with BID. BID-04

Moreover, any statements or analyses related to Reclamation's, or its contractor's use of property owned by BID, should be clarified that future agreements with BID must be obtained. Although Reclamation likely understands this point, it should be noted in the Final EIS.

2.3.8 Operations

p. 27

Reclamation states that "consideration for habitat and water quality needs in American Falls Reservoir and the river reach between American Falls and Lake Walcott may affect the timing of reservoir refill." Reclamation should clarify that fill of storage water rights is not conditioned or dependent upon "habitat and water quality" needs in anyway. Although Reclamation has historically sought to release 350 cfs from American Falls Reservoir in the non-irrigation season, undefined "habitat and water quality" needs in the reservoir or the river do not condition storage under water rights that have been acquired pursuant to State law. BID-05

Reclamation further states that "up to 100 cfs" would be discharged through the new spillway at various release points during the non-irrigation season to "replace the leakage which currently occurs across the existing spillway". Again, BID does not believe Reclamation has any obligation to continue to provide water during the non-irrigation season due to the fact the existing spillway leaks and has not functioned properly over time. If water can be saved for storage purposes or power generation pursuant to Reclamation's obligations to BID and other spaceholders, Reclamation should operate the new spillway for those purposes. There is no legal requirement for Reclamation to provide water to "maintain the existing wetland community within the spillway area" that has resulted from defects in the historical spillway. Reclamation should modify the Draft EIS accordingly. BID-06

Chapter 3 Affected Environment and Environmental Consequences

3.6 Aquatic Biota

p. 99

BID disputes Reclamation's characterization that "significant numbers of both game and nongame fish enter the canal system during the irrigation season". Although certain fish may incidentally enter BID's canal system during the irrigation season, there is no basis to state that these numbers are "significant", particularly when compared to existing fish populations in the Snake River and Lake Walcott. BID is entitled to divert water into its canal to serve landowners within the irrigation district pursuant to water rights acquired by State law. Reclamation should clarify this point in the Final EIS accordingly. BID-07

p. 110-11

BID agrees with Reclamation that "[n]o significant changes would be made to the overall flow conditions in the river reach below Minidoka Dam" as a result of the preferred alternative. However, BID is unclear with respect to Reclamation's statement that the "reach would remain highly regulated and constrained by Federal and State water delivery contracts". Although water BID-08

is delivered pursuant to water rights acquired pursuant to State law below Minidoka Dam, and Reclamation generates power pursuant to water rights and contract obligations at Minidoka Dam, BID is unaware of any "State water delivery contracts". The statement should be clarified in the Final EIS.

Although some "entrainment" of fish may continue to occur in the South Side Canal under the preferred alternative, BID disputes any characterization that "screening" is necessary. BID agrees that the cost for installation and operation of fish screens is not practical, nor would it provide any measurable benefit to game or nongame fish species. BID-09

3.8.1 Affected Environment

Utah Valvata

p. 148-151

Reclamation should note that the U.S. Fish & Wildlife Service recently proposed a final rule to remove the Utah valvata (*Valvata utahensis*) from the federal list of threatened and endangered species. *See* 74 Fed. Reg. 34539. BID submitted comments in support of FWS' proposed de-listing of the Utah valvata on September 11, 2009 and believes this proposed action should be acknowledged by Reclamation. Furthermore, in the event FWS issues a final rule to delist the Utah valvata prior to issuance of the Final EIS, Reclamation should revise its analysis in this section accordingly. BID-10

Appendix E

p. 3-4

BID agrees with Reclamation's assessment that although some fish entrainment may continue to occur under any of the proposed alternatives, there will be no significant impacts to any game or nongame fish species. As discussed above, BID disputes the characterization that "significant" numbers of fish enter the canal system during the irrigation season. Moreover, it is clear that despite any fish that do enter the canal system, the fish populations in the Snake River and Lake Walcott are not impacted. BID-11

Accordingly, there is no basis to consider a third alternative to include environmental and economic analyses of installation of fish screens on the existing canals, including BID's South Side Canal. Since Reclamation is not required to study the alternative, BID agrees it is not necessary for purposes of the Final EIS.

Conclusion

BID appreciates the opportunity to provide these comments on the Draft EIS. Again, BID supports Reclamation's preferred alternative including the design and proposed location of the new spillway for Minidoka Dam.

BID requests Reclamation to consider the above comments and appropriately address the comments in the Final EIS. If you have any questions please contact Randy Bingham (BID – Manager) at 678-2511 or myself at 733-0700.

Sincerely,

BARKER ROSHOLT & SIMPSON LLP

Travis L. Thompson

cc: Randy Bingham, Manager
Board of Directors

Reclamation’s Responses to Letters of Comment

Letter & Comment #	Response
FWS/ Winslow1 01	Comment noted. The following statement has been included in Section 2.3 Alternative B – Spillway and Headworks Replacement, 2.3.8 Operations "Based on changes to the spillway, operational flows through the facility would also be change. Operation of the radial gates would be multipurpose consisting of: • All downstream deliveries beyond the capacity of the powerplants including salmon flow augmentation • Flows as the result of flood operations • In the event that the existing three radial gates become disabled or are off-line for maintenance, one or more of the new gates will be used to pass flows during load rejection at the powerplants" Also, Section 2.3.8 Operations has been altered to provide the 300 cfs flows through the radial gates as opposed to the original design which included a pipe specifically dedicated to the 300 cfs.
FWS/ Winslow2 01	Correction noted.
FWS 01	The Purpose and Need discussion in Chapter 1, Section 1.2 has been revised to indicate that the purpose and need for changing spillway and reservoir operations is related to increased power production. Changes have also been made to the text in the Final EIS under the operations discussion in Section 2.3.8 to reflect this.
FWS 02	Reclamation has altered the text in the Final EIS to reflect this comment. The revised operations description can be found under Section 2.3.8 Operations, which applies to each action alternative. To summarize, while increased generation is the intent of this change in spillway flows, the ultimate decision on how the spillway flows will be conducted will be based on results of the adaptive management process described in this same section.
FWS 03	Reclamation has altered the Proposed Action to reflect this comment. The revised operations description can be found under Section 2.3.8 Operations. To summarize, for each action alternative, Reclamation proposes to establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. In addition, in each action alternative, instead of immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period,

Letter & Comment #	Response
	monitoring impacts as changes are made. Based on monitoring results and in consultation with the Technical Team, Reclamation will, within Reclamation's operational flexibility, adjust operations to avoid impacts, or provide mitigation.
FWS 04	Reclamation will include in each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations, and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
FWS 05	Comment noted.
FWS 06	Reclamation believes that Section 3.2 adequately reflects unavoidable adverse effects.
FWS 07	As discussed above, Reclamation will include in each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations, and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
FWS 08	Comment noted. Reclamation has prepared a more in depth analysis of waterfowl and other migratory water birds, which is included in the Final EIS under Section 3.7.2, Avian Communities.
FWS 09	Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be

Letter & Comment #	Response
	developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
FWS 10	Reclamation intends to monitor the response of muskrats and beavers using the FWS refuge's data sources. Cottonwood trees may need to be protected with fencing. Willow and cattail species should not be significantly affected by a slight increase in muskrat and beaver populations. (Bouffard 2009)
FWS 11	Reclamation currently coordinates with a number of other Federal, State and local governments to manage invasive species, including aquatics on lands and waters within its jurisdiction. Reclamation will utilize, and modify if needed, its current invasive species management program to monitor for increased invasive species establishment as may be influenced by this project. With the revised operations as described in Section 2.3.8 Operations, Reclamation has retained the flexibility, if needed, to adjust operations to help control, or deter establishment of, invasive species.
FWS 12	Reclamation's adjusted reservoir operations will inevitably result in incidental take on select years. This will be addressed in the long-term operations BA Reclamation intends to submit to USFWS prior to the completion of the new spillway structure. In addition, impacts will be addressed in the Final EIS in Section 3.8.
FWS 13	Comment noted. Changes to text adding adaptive management to operations are discussed in Section 2.3.8 Operations.
FWS 14	The MODSIM model was populated with hydrology through water year 2000 only and does not overlap with FWS data analysis. At the time Reclamation's study was performed, hydrology data for 2001 through 2008 had not been processed and was therefore not incorporated into the model. Since Reclamation has committed to reducing spill incrementally over a 4-year period with monitoring of impacts, re-running the model with the 2001-2008 data is not considered to be necessary. The monthly model time step utilizes monthly average values and does not allow for partial month depiction of increased spillway flow days. However, exceedence curves for the irrigation season months have been included in the Final EIS.
FWS 15	We agree with this comment and have corrected the analysis in each of the specific resource sections where it is applicable. In addition, in each action alternative, Reclamation will adopt an adaptive

Letter & Comment #	Response
	management approach to spillway operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.
FWS 16	Reclamation agrees that this paragraph does not capture the complete rationale for establishing the 1,300 to 1,900 cfs minimum spillway flows. This has been corrected in Section 3.6 Aquatic Biota, 3.6.1 Affected Environment, Spillway Fish Community, Fish Habitats The original paragraph does however, correctly indicate that these minimum flows were not effective in preventing excessive warming due to insolation. See also response to FWS 17.
FWS 17	The analysis concerning water temperature and travel time across the spillway at the reduced discharge level was based on a qualitative examination of temperatures and travel time using a very basic water quality model. In this case the SSTEMP model was used. The model was neither validated nor calibrated to the existing conditions of the spillway. However, some parameters from the spillway were estimated and background temperatures from the reservoir were used in the qualitative analysis. Discharge was varied from 1,300 cfs to 500 cfs. The resulting temperature and travel time changes for this qualitative review indicated that travel time would increase only slightly and that daily maximum temperature increases of less than a few tenths of a degree Celsius may occur. As a result of this qualitative analysis no further temperature modeling was conducted. In addition, the impact to the temperature of the Snake River below the spillway was based on a qualitative mass balance assessment of temperature. The reduced spillway discharge of 500 cfs would be approximately 5.8 percent of the powerhouse maximum discharge. If there were a 1°C increase in temperature across the spill way in comparison with the powerhouse temperature (from 25 to 26°C) the resulting mixed temperature of the Snake River below the spillway would increase approximately 0.05°C. A 2°C change (from 25 to 27) would result in a temperature change of approximately 0.11 °C. It is likely that a change of this magnitude would not be detectable with today's field grade thermistors and thermal couples. The

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	accuracy of common temperature data loggers are ±0.2°C. The Hiebert and Bjornn 1980 report, while likely state of the science 30 years ago has several serious errors and omissions that make the conclusions concerning temperature and travel time suspect. Primarily they tested temperature and discharge relationships at two different locations and at two drastically different discharge regimes. The results from the two tests were then mixed and reported as reasonable estimates of temperature changes across the entire spillway. Separately it would appear that 350 cfs in the south channel should result in limited temperature changes while 500 cfs in the main channel would result in 1.26°C temperature increases. Again this temperature difference is within the accuracy of temperature measuring devices of today. The accuracy is much improved over the pocket thermometers dipped into channels of the spillway in 1978 and 1979. Heibert and Bjornn (1980) then went on to mix the analysis from the two channels together, from which they reported that discharges less than 1,000 cfs would result in 2 to 2.5°C temperature increases. In effect they mixed apples and oranges. The first temperature discharge relationship was developed in the south channel and covered discharge between 100 and 350 cfs. No temperature changes were measured at 350 cfs in their analysis. The descriptions of the action alternatives indicate that during the summer period approximately 300 cfs will be discharged through the south channel via the new radial gates. If the south channel relationship from Heibert and Bjornn (1980) holds there will be no temperature change in this portion of the spillway. However, the main channel will effectively be dewatered with only 200 cfs being discharged through this section. In the 1980 report, the relationship developed for the main channel discharge did not cover flows this low. The lowest discharge level was 1,000 cfs. Extrapolation below 1,000 cfs should be viewed with extreme skepticism. That being said, the relationship for the main channel from the 1980 report would indicate that 1.44°C temperature change could be expected at 150 cfs. Again concern should be raised considering the study was completed with pocket thermometers at accessible locations within the main channel and

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	may not reflect what is occurring in the deeper less accessible location in the main channel. While 1.44°C may begin to impact aquatic resources in the main channel of the spillway during the warmest months of the year, it should be recognized that the temperature increase would not be an instantaneous rise in temperature throughout the whole main channel. The pools and channel area closest to the discharge location would remain near background. The pools and channel area at an unknown distance downstream would warm slightly above background conditions, and according to the 1980 report relationship, the water leaving the spillway would approach being 1.44°C warmer. If one assumes that the temperature is a linear response to time, as was assumed in the 1980 report, then the >1°C critical temperature rise would be limited to the bottom 29% of the main channel. If the main channel length is 0.75 miles in length this would result in approximately 1,131 feet of the main channel rising above the critical 1°C increase. This relationship does not take into consideration factors that may change the relationship from a linear response such as cooling effects of groundwater upwelling or the positive and negative heat exchange with exposed ground surfaces. The remaining 2,829 feet of the main channel would remain as viable habitat for aquatic resources. Coupled with the habitat from the south channel this area of suitable habitat would provide adequate refugia for mobile aquatic resources on the warmest of summer days when the impacts are likely to occur. For the remainder of the period the temperature impacts would likely be negligible for the entire main channel of the spillway.
FWS 18	Rainbow trout occurrence in the spillway, immediately below the existing radial gates, is addressed in the last paragraph on page 100 of the Draft EIS. As stated in the Draft EIS, spillway catch rates are very low compared to Lake Walcott. However, the action alternatives have been altered such that it is now proposed that flows be provided though a radial gate in the new gated spillway. This operation should entrain more fish and create turbulent, well-oxygenated conditions below the gated spillway; thereby providing habitat for rainbow trout during the irrigation season. This will be particularly important during late July and early August when reservoir and spillway water temperatures are typically the highest.
FWS 19	The addition of an adaptive management approach, which includes

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	monitoring, is now included for each action alternative, and described in Alternative B, Section 2.3.8 Operations. This will ensure that potential effects of the spillway flows on endangered snail species, as well as on other natural resources in the spillway, will be examined.
FWS 20	The response to FWS 17 explains the difficulty with Hiebert and Bjornn's report. In addition, Reclamation has included a change in the action alternatives to decrease spillway releases incrementally and conduct monitoring to determine impacts to resources. Therefore, Reclamation does not plan to do a re-evaluation for the Final EIS.
FWS 21	This comment is an extension of comment 17 and has been addressed there. In addition, given the proximity of the snail pool to the release point, it is likely benthic temperature increases will be nearly undetectable. However, Reclamation's proposal to incrementally reduce flows and monitor resource impacts will ensure impacts to Snake River physa, associated with operations, will be avoided.
FWS 22	Canal entrainment was discussed in the Draft EIS. Screening will not be considered because it would increase the cost of the project significantly, and it is not required until a determination of need is issued by the IDFG Director (Idaho Code Section 36-906) (refer to Comment FWS 23).
FWS 23	The entrainment that occurs at the headworks has occurred since Minidoka Dam was completed in 1906 and is considered part of the existing environment for this project. In accordance with Idaho Code Section 36-906, screening is not required until the IDFG Director determines a need and issues a written order for them to be constructed. Alternative B will be revised to acknowledge this issue in Section 3.6 Aquatic Biota, Affected Environment, Alternative B, Reservoir Fish Community, Fish Populations
FWS 24	This alternative will not be considered because it will increase the cost of the project significantly and there has been no determination of need issued by the IDFG Director.
FWS 25	Reclamation believes this has been addressed appropriately.
FWS 26	Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well

Letter & Comment #	Response
	as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
FWS 27	Based on this comment the following statement is added to Alternative B, Section 2.3.7 Construction. "No reseeding of this area will occur post construction. This area is currently used for equipment and material storage and will continue to be used for this purpose in the future."
FWS/REFUGE 01	Comment Noted.
FWS/REFUGE 02	Reclamation believes that impacts to the FWS infrastructure due to the Proposed Action are minimal, if not non-existent. However, if additional information or monitoring shows that damage to any of these structures is caused by the Proposed Action, then Reclamation will within its authority, work with FWS to prevent, repair, or replace structural damage
EPA 01	The nutrient cycling and sediment transport were qualitatively assessed in the document by both Reclamation and IDEQ. Based on the limited operational changes to the reservoir during the critical summer period this approach remains valid. Extensive 2 or 3 dimensional modeling of the reservoir for nutrient export or retention is not appropriate given the limited changes proposed during the critical summer period. Qualitative modeling of temperature effects anticipated from the operation changes made to the spillway were assessed with the SSTEMP (Stream Segment Temperature) model and it was determined that the changes would be within instrumentation and modeling errors and thus operational changes would be indistinguishable from background. Furthermore, new minimum flows and an adaptive management plan have been proposed (see spillway operation descriptions). As a result, the effects of operational changes on temperature and other water quality parameters will be empirically measured, negating any need for water quality modeling. Similar text was added to Section 3.4.2 – Environmental Consequences, Alternative B, Snake River Downstream, Operation Impacts in the Final EIS clarifying how these conclusions were reached. Furthermore, throughout the draft

Letter & Comment #	Response
	stages of the EIS preparation, Reclamation coordinated with and provided review drafts of the water quality sections of this EIS to the IDEQ. The staff in the IDEQ Twin Falls Regional Office assisted Reclamation in assessing the potential water quality impacts of the three alternatives. In addition, they provided data and helped to determine which potential pollutants should be assessed the how the alternatives would impact the water quality in the affected areas. They also provided oversight as to the relationship of the proposed alternatives with the nutrient TMDL that has been approved in the downstream segment. IDEQ will be responsible for 401, water quality certification of the 404 permits from the Corps.
EPA 02	Reclamation has coordinated with the Corps, including site visits to the project, to discuss how the wetland habitat within the spillway area should be addressed. The result was an agreed upon approach, as described below, and is being put forward through the CWA 404 permitting process. Under the Section 3.7 Terrestrial Biota, 3.7.2 Environmental Consequences, Alternative B- Spillway and Headworks Replacement, the appropriate sections are changed to address this comment. A summary of these changes can be found in the Mitigation portion for Section 3.7 Terrestrial Biota which will be altered to include the statement, "Reclamation will mitigate on a one to one basis for wetland losses due to construction activities. After completing a wetlands functional assessment, a total of 3 acres of appropriate functioning wetland will be constructed on the southwest edge of the spillway. The site of mitigation for these wetland habitats would be located on the southwest edge of the spillway (Appendix B – Figure 2-6). This area currently supports a vegetative community of predominately sagebrush and cheatgrass. Immediately northwest of this area (Appendix B – Figure 2-6) , in a solid stand of cheatgrass, appropriate native plants (including sagebrush) would be planted on a one to one basis to replace the lost sagebrush community in the wetland mitigation area."
EPA 03	Reclamation has worked with the Corps and commits to the following:

Letter & Comment #	Response
	Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources will be revised based on this comment. In addition, .due to spillway operational changes, Reclamation will complete a functional assessment prior to completion of construction to establish a baseline for adaptive management monitoring. A monitoring plan will be developed with the assistance of the Technical Team, which includes the establishment of impact thresholds, and if it is concluded that negative impacts occur to the wetland habitats, the spillway flows will be increased appropriately to protect the impacted wetland habitat. Please take note that EPA will receive an invitation to be a part of the Technical Team which will assist in the establishment of monitoring protocols and impact thresholds.
Corps 01	Comment noted. Reclamation has identified wetlands impacted by this action and commits to conducting wetlands delineation prior to construction. The Final EIS has been modified to reflect this commitment under in Section 3.7 Terrestrial Biota, 3.7.2 Environmental Consequences, Alternative B- Spillway and Headworks Replacement.
Corps 02	Comment noted. Reclamation has adjusted the Section 3.7 Terrestrial Biota, 3.7.2 Environmental Consequences, Alternative B-Spillway and Headworks Replacement, Construction Impacts, to include a commit to working through and complying with the Section 404 permitting process of the Clean Water Act prior to construction. This includes obtaining Section 401 water quality certification from the State on any 404 permits obtained.
Corps 03	In response to this comment, a table was included in Section 2.5 Alternatives Eliminated from Further Study of the Final EIS, which summarizes the most reasonable alternatives considered and why they were eliminated.
Corps 04	Comment noted. Reclamation has identified wetlands impacted by this action and commits to conducting wetlands delineation prior to construction. Under the Section 3.7 Terrestrial Biota, 3.7.2 Environmental Consequences, Alternative B- Spillway and Headworks Replacement, the appropriate sections are changed to address this comment. A summary of these changes can be found in the Mitigation portion for Section 3.7 Terrestrial Biota which will be modified to state, “Due to spillway operational changes,

Letter & Comment #	Response
	Reclamation will complete a functional assessment prior to completion of construction to establish a baseline for adaptive management monitoring. A monitoring plan will be developed with the assistance of the Technical Team, which includes the establishment of impact thresholds, and if it is concluded that negative impacts occur to the wetland habitats, the spillway flows will be increased appropriately to protect the impacted wetland habitat. Reclamation will mitigate on a one-to-one basis for wetland losses due to construction activities. After completing a wetlands functional assessment, a total of 3 acres of appropriate functioning wetland will be constructed on the southwest edge of the spillway. The site of mitigation for these wetland habitats would be located on the southwest edge of the spillway (Appendix B – Figure 2-6). This area currently supports a vegetative community of predominately sagebrush and cheatgrass. Immediately northwest of this area (Appendix B – Figure 2-6) , in a solid stand of cheatgrass, appropriate native plants (including sagebrush) would be planted on a one-to-one basis to replace the lost sagebrush community in the wetland mitigation area."
Corps 05	Comment noted. Reclamation has identified wetlands impacted by this action and commits to conducting wetlands delineation prior to construction. Under the Section 3.7 Terrestrial Biota, 3.7.2 Environmental Consequences, Alternative B- Spillway and Headworks Replacement, the appropriate sections are changed to address this comment. A summary of these changes can be found in the Mitigation portion for Section 3.7 Terrestrial Biota which will be revised to state, "Due to spillway operational changes, Reclamation will complete a functional assessment prior to completion of construction to establish a baseline for adaptive management monitoring. A monitoring plan will be developed with the assistance of the Technical Team, which includes the establishment of impact thresholds, and if it is concluded that negative impacts occur to the wetland habitats, the spillway flows will be increased appropriately to protect the impacted wetland habitat. Reclamation will mitigate on a one-to-one basis for wetland losses due to construction activities. After completing a wetlands functional assessment, a total of 3 acres of appropriate functioning wetland will be constructed on the southwest edge of the spillway. The site of mitigation for these wetland habitats would be located on

Letter & Comment #	Response
	the southwest edge of the spillway (Appendix B - Figure 2-6). This area currently supports a vegetative community of predominately sagebrush and cheatgrass. Immediately northwest of this area (Appendix B – Figure 2-6) , in a solid stand of cheatgrass, appropriate native plants (including sagebrush) would be planted on a one-to-one basis to replace the lost sagebrush community in the wetland mitigation area."
BPA 01	Reclamation has modified the operational constraints defined for Alternatives B and C. Reclamation does not anticipate any negative effects to downstream power generation as a result of this proposed operation. Model results are presented in the Final EIS.
BPA 02	Reclamation has modified the operational constraints defined for Alternatives B and C. The revised operations description allows for draft and refill of the pool during the October through March time frame. Model results are presented in the Final EIS.
IDFG 01	Reclamation is committed to consideration of natural resources when proposing water or land management actions. In compliance with the FWCA for water management actions, Reclamation arranged for the preparation of a FWCA Report that provides recommendations for our consideration relative to fish and wildlife impacts.
IDFG 02	Comment noted. The Species Management Plans have been reviewed and utilized in the preparation of the Final EIS.
IDFG 03	Comment noted. The "Snake River Basalts" section of IDFG's "Idaho Comprehensive Wildlife Strategy" was utilized in the preparation of the Final EIS.
IDFG 04	Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.

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IDFG 05	The increased operational flexibility described in Alternative B, Section 2.3.8 Operations will result in winter drawdowns 25 to 50 percent of the time, as compared with the No Action alternative. This will result in a reduced number of winter drawdowns, but will still allow flexibility for managing the reservoir based on irrigation demand, facility maintenance, and environmental concerns.
IDFG 06	Comment noted. Reclamation has prepared a more in depth analysis of waterfowl and other migratory water birds in the Final EIS under Section 3.7.2, avian communities. In addition, Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
IDFG 07	Comment noted. Chapter 3 Affected Environment and Environmental Consequence, Section 3.2.4 Mitigation, was revised and the following statement was included, "Any changes or alterations to natural resources potentially resulting from changes in reservoir and/or spillway hydrology will be addressed in the respective portion of this document."
IDFG 08	Thank you for your comment. The relevance of the fishery to regional recreationists is acknowledged in Recreation, Section 3.13.1 Affected Environment, Recreation Above Minidoka Dam, Lake Walcott Recreational Opportunities, under Fishing
IDFG 09	Correction made in the Final EIS in Affected Environment, Section 3.6.1 Reservoir Fish Community, Canal Entrainment.
IDFG 10	The use of the 300 cfs pipe has been eliminated in the action alternatives. This has been replaced by using the radial gates to provide the 300 cfs. This should result in entrainment rates similar to those observed prior to the construction of the Inman Powerplant.
IDFG 11	Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team,

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	consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
IDFG 12	As stated above, Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
IDFG 13	Although the State of Idaho does not list Russian Olive as a noxious weed, on certain Reclamation lands Reclamation <u>does</u> treat Russian Olive as a noxious species and we remove the plant if one is located. Lake Walcott has many Russian Olive trees around the shoreline and we do not remove them from this location.
IDFG 14	Please refer to the response in IDFG 06.
IDFG 15	Comment noted. Reclamation has prepared a more in depth analysis of impacts to tundra swans to be included in the Final EIS in Section 3.7.2, Avian Communities.
IDFG 16	Comment noted. The sentence in question will be removed.
IDFG 17	No statistical analysis was performed. This was a visual analysis of the GIS inundation figure mapped by Reclamation for this project. A decrease in spillway flows would not decrease the wetted footprint significantly due to the morphology of the spillway area (Figure 3-2). In addition, Reclamation will establish a Technical Team to assist in determining the appropriate minimum flow in the spillway. Rather than immediately implementing a minimum spillway flow of 500 cfs. Reclamation will incrementally reduce the spillway flows over a 4-year period, monitoring impacts as changes are made. Based on monitoring results and assistance from the Technical Team, Reclamation will adjust operations accordingly to

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	avoid impacts, or provide mitigation if required.
IDFG 18	Comment noted and changes have been made in the Final EIS to Section 3.7 Terrestrial Biota, Alternative B, Spillway Operations Impacts.
IDFG 19	Comment noted and changes have been made in the Final EIS to Section 3.7 Terrestrial Biota, Alternative B, Spillway Operations Impacts, Avian Communities.
IDFG 20	Comment noted and changes have been made in the Final EIS to Section 3.7 Terrestrial Biota, Alternative B, Spillway Operations Impacts
IDFG 21	Comment noted and changes have been made in the Final EIS to Section 3.7 Terrestrial Biota, Alternative B, Spillway Operations Impacts.
IDFG 22	Comment noted. However, while the Fisheries Management Plan was referenced, the discussion was still centered on wildlife, so the text will not be relocated.
IDFG 23	Comment noted. Reclamation has prepared a more in-depth analysis of waterfowl and other migratory water birds in the Final EIS under Section 3.7.2, Avian Communities and to the appropriate sections addressing the other pertinent natural resources.
IDFG 24	IDFG's pelican management plan was reviewed. The Final EIS text will be adjusted to address IDFG's pelican management plan.
IDFG 25	Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively.
IDFG 26	Thank you for providing this information. The bald eagle section of the Final EIS was updated using the new, available information referenced.
IDFG 27	Comment noted. This new information will be implemented into the Final EIS. Thank you for providing this information.
IDFG 28	Reclamation sees no contradiction between the two sections identified. The referenced paragraph on page 139 (Section 3.7.2) is discussing vegetation densities "associated with the new footprint of the …structure…" This is a very small area (app. 1.1 acres). The

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	discussion referenced on page 158 (Section 3.8.1) is discussing the collective spillway area. Vegetative density in the spillway varies greatly.
IDFG 29	Comment noted. Section 3.8.2 Environmental Consequences, Alternative B, Utah valvata, Spillway Operations Impacts, has been rewritten and the statement referenced in this comment has been deleted.
IDFG 30	Reclamation discontinued use of the previously proposed 300 cfs pipe and is proposing to provide flows using a radial gate in the gated spillway portion of the spillway structure. This information is provided in the Final EIS in Section 2.3.8.
IDFG 31	The new information provided will be incorporated into the Final EIS.
IDFG 32	Hunting outside the immediate spillway/dam area will be addressed further in the Final EIS under Section 3.13 Recreation.
IDFG 33	The impact discussions are focused upon the areas in which impacts are expected to occur.
IDFG 34	The text in the Draft EIS page 196, 3.13.1.3.3, Other Activities will be replaced with: "In addition to fishermen and birders, other visitors in the area immediately below the dam include sightseers, photographers, and boaters. Hunting is not popular in the area immediately below the dam adjacent to the refuge. The area below the dam, as defined in Figure 2-7, is almost entirely within the Minidoka Refuge, in an area hunters are not allowed to enter to retrieve game. Hunters and their dogs are permitted to retrieve downed game only within the designated hunting areas on the south side of the main body of the lake and at the east end of the lake. Some private landowners allow goose hunting in their grain fields, and there are plenty of lands available outside this immediate area for deer and coyote hunting. (Bouffard 2009)."
IDFG 35	Reclamation understands the inconvenience of lost access to the spillway and headgate structures as a result of the Proposed Action, but public safety and the protection of the structures are higher priorities than recreational access. In addition, since access would be on private lands, Reclamation can't promise that access would be obtained.
IDFG 36	The use of the 300 cfs pipe has been eliminated in the action alternatives. This has been replaced by using the radial gates to provide the 300 cfs. This should result in entrainment rates similar

Letter & Comment #	Response
	to those observed prior to the construction of the Inman Powerplant. In addition, Reclamation has included for each action alternative an adaptive management approach to reservoir operations, within Reclamation's operational flexibility, addressing the outcomes of cooperative monitoring activities. Reclamation will establish a Technical Team, consisting of representatives from State and Federal agencies as well as academia, to assist in developing specific monitoring plans. If monitoring determines that mitigation is necessary, it will also be developed cooperatively. This will be included in the revised operations description in Chapter 2 Alternatives, Section 2.3.8 Operations and elsewhere in the Final EIS under the specific sections addressing the various natural resources.
IDFG 37	Canal entrainment was discussed in the Draft EIS. Screening will not be considered because it would increase the cost of the project significantly, and it is not required until the IDFG Director issues a determination of need. (Idaho Code Section 36-906)(Refer to Comment FWS 23).
IDFG 38	Comment noted. Reclamation will make every effort to incorporate the technical team's recommendations regarding monitoring and subsequent management strategies within our legal authorities, contractual obligations and funding limitations.
ISP 01	Thank you for your comment. Overall, the drawdown has no appreciable effect on boating (closed to boating October 1st – March 31st, winter activities (almost exclusively ice fishing), or fishing.
ISP 02	Thank you for your comment. The loss of public access to and over spillway structure will be acknowledged in the Final EIS under Section 3.13 Recreation, 3.13.2 Environmental Consequences, Alternative B, Recreation Above Minidoka Dam, Operational Impacts and Recreation Below Minidoka Spillway, Operational Impacts.
ISP 03	Comment noted
IWUA 01	Comment noted
FMID 01	Comment noted

Letter & Comment #	Response
BID 01	Reclamation believes that, depending on the time of year and the degree of failure, failure of the Minidoka Spillway could very likely affect Reclamation's ability to provide flow augmentation.
BID 02	Comment noted
BID 03	Under existing conditions, and as described in Alternative A - No Action, Section 2.2.3 Operations, Reclamation is required to provide flows of up to 1900 cfs in the spillway during the irrigation season as part of the mitigation requirements for construction of the Inman Powerplant. Alternative B – (Preferred Alternative) presents a design and operation (as described in the revised Chapter 2 Alternatives, Section 2.3.8 Operations), which meets the intent of that mitigation requirement while allowing lower spillway flows. Routing of water through the spillway as described will not affect delivery of water to spaceholders and will result in additional power generation as described in the revised Section 3.5 - Hydropower Generation.
BID 04	Comment noted. The Final EIS will be changed to address this issue. The contractor will be required to obtain agreement from BID before any construction can take place in, or over, the South Side Canal.
BID 05	Comment noted and the referenced sentence was changed to read, "While water rights and their priorities are not affected, considerations for habitat and water quality needs in American Falls Reservoir and the river reach between American Falls and Lake Walcott may affect the timing of the physical reservoir refill."
BID 06	Under existing conditions, and as described in Alternative A - No Action, Section 2.2.3 Operations, Reclamation is required to provide flows of up to 1900 cfs in the spillway during the irrigation season as part of the mitigation requirements for construction of the Inman Powerplant. Alternative B – (Preferred Alternative) presents a design and operation (as described in the revised Chapter 2 Alternatives, Section 2.3.8 Operations), which meets the intent of that mitigation requirement while allowing lower spillway flows. Routing of water through the spillway as described will not affect delivery of water to spaceholders and will result in additional power generation as described in the revised Section 3.5 - Hydropower Generation.
BID 07	IDFG has documented entrainment into the canals in Partridge, Corsi, and Bell (1990) and Hiebert and Bjorn (1980). Additionally Reclamation personnel have assisted in salvaging white sturgeon out

Letter & Comment #	Response
	of the canals (Newman 2009a) and have observed the effects of entrainment first hand.
BID 08	Comment noted. The text in the Final EIS was corrected to state, "The reach would remain highly regulated and constrained by Federal water delivery contracts and State water rights administration." Under Section 3.6.2 Environmental Consequences, Alternative B – Spillway and Headworks Replacement, Reservoir Fish Community, Fish Populations.
BID 09	Screening of the canals is not planned in the Proposed Action alternative.
BID 10	Comment noted.
BID 11	Comment noted.

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Summary of Public Meeting Comments and Reclamation's Responses

RECLAMATION'S RESPONSES TO
PUBLIC MEETING COMMENTS

1. Should not require screening of canals.
   Comment noted. The screening of the North and South Side canals is not part of any of the alternatives being considered.

2. Should have catwalk access to reach northern end of spillway.
   No public access will be allowed on the new spillway structure for security and public safety reasons. But, the public will not be prevented from using the new service road which will parallel the new structure on the downstream side. This road will extend north to the existing radial gates. However, it should be noted that at times, when maintenance or repair work is being conducted, public access to the service road will be restricted.

3. Support Special Use Areas.
   Comment Noted.

4. Support Alternative B.
   Comment Noted.

5. Support fishery and spill or by pass water modifications.
   Comment noted. As the result of comments from the public and State and Federal agencies, the Proposed Action will be slightly modified to better support the spillway fishery and other biological resources.

6. Should use local labor, skills and resources.
   While the project will be bid competitively to the public at large in accordance with Federal acquisition regulations, it is anticipated that the selected contractor will most likely use local labor, skills, and resources for a significant portion of the work.

7. Would like access over wall at 5 mile hole to water.
   In attempting to respond to this comment, Reclamation has been unable to determine the correct location of the site referred to as "5 Mile Hole. Consequently, we cannot provide an appropriate response to this comment. If

the author of this comment will contact the Upper Snake Filed Office, to clarify this comment, we will gladly provide a comment, either verbally, or in writing.

8. Support for reservoir fishery; should stock it more to reach full potential as fishery.
   As proposed, the new operations of the reservoir should improve the smallmouth bass fishery and the trout fishery should not be negatively impacted. The responsibility for stocking the reservoir lies with Idaho Department of Fish and Game.

9. Don't want boating interrupted during construction.
   There should be little, if any, impacts to boating activities during construction.

10. Want bow dam like Hoover Dam.
    The design that was selected for this project was determined through a detailed process involving a number of engineers from Reclamation's Technical Services Center in Denver, the Pacific Northwest Regional Office and the local Upper Snake Field Office. In addition, the Burley and Minidoka Irrigation Districts provided their local knowledge and also contracted with a noted engineering firm to also provide input. We are confident that the selected design is the most appropriate and cost effective design available for the intended purpose of this project.

11. What to consider possibility of raising dam and creating more storage while the spillway work is being done
    While not, specifically, a Reclamation sponsored effort the Idaho State Water Resources Board, through the Idaho Department of Water Resources is working with Reclamation to study the possibility of just such a raise. The results of that study will be available in the fall of 2010.

12. Would like bridge at south side canal to provide access to ice fishing on south side of reservoir
    Whether a permanent bridge or other canal crossing structure is allowed on the South Side Canal is a decision for the Burley Irrigation District to decide. Although it is located on Reclamation administered land, the canal is under Burley Irrigation District ownership. It is not within Reclamation's authority to make that decision.

13. If no bridge provided for ice fishing access, would like to have snowmobile or 4 wheel access across reservoir for ice fishing on south side
    As Lake Walcott is within the Minidoka National Wildlife Refuge, it is closed to motorized vehicles from October 1 through March 31 each year by the Fish and Wildlife Service. It is the responsibility of the U.S. Fish and Wildlife Service to determine whether winter time motorized use of the reservoir is appropriate.

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Appendix I State Historic Preservation Office Correspondence

United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

SRA-6116
LND-8.00

FEB 0 3 2009

Mr. Reid J. Nelson
Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004-2501

Subject: Proposed Replacement of Spillway at Minidoka Dam, Minidoka Project, Idaho, Compliance with Section 106 and NEPA

Dear Mr. Nelson:

The Bureau of Reclamation is proposing to replace the spillway and associated headgates at Minidoka Dam for the purpose of preventing structural failure of these features. Minidoka Dam was constructed in 1906 and placed on the National Register of Historic Places in 1974. The site is located on the main stem of the Snake River, about 18 miles northeast of the city of Burley, in south central Idaho (Enclosure 1). After over 103 years of continued use, the 2,142 foot spillway at Minidoka Dam has reached the end of its functional lifespan. The concrete that forms the spillway crest and the piers and stoplog structure show extensive visible deterioration at numerous locations. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen in the spillway.

Pursuant to section 102(2)(C)of the National Environmental Policy Act (NEPA) of 1969, as amended, Reclamation intends to prepare an Environmental Impact Statement (EIS) on the proposed Minidoka Dam Spillway Replacement. Alternatives currently being considered are No Action as required under NEPA, total replacement of the spillway and headgate structures, or replacement of just the spillway (Enclosure 2). Reclamation is requesting early public comment, tribal comments, and agency input to help identify significant issues or other alternatives to be addressed in the EIS. Information obtained during the scoping period will help in developing information to be included in the EIS. Reclamation plans to begin drafting the EIS in the spring of 2009.

This letter serves as notification to the Advisory Council on Historic Preservation that Reclamation would like to use the process and documentation required under NEPA to comply with the requirements of Section 106, as provided for under 36 CFR 800.8(c). In using the NEPA process for Section 106 purposes, Reclamation intends to meet the *"Standards for*

developing environmental documents to comply with Section 106," contained in Section 800.8(c)(1) of the regulations, as well as other requirements specified in 800.8(c)(2-5).

Please direct any questions about the above-stated intent to Dr. Ray Leicht, Archeologist, of my staff at 208-383-2215, or via e-mail at rleicht@pn.usbr.gov.

Sincerely,

JERROLD D. GREGG

Jerrold D. Gregg
Area Manager

Enclosures - 2

bc: SRA-1206 (Meuleman), SRA-6135 (Huang), SRA-6116 (Leicht) (w/o encls)

WBR:RLeicht:cwh:1/29/09:208-383-2215:SRA-6116
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United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

SRA-6116
LND-8.00

FEB 0 3 2009

Ms. Suzi Pengilly
Deputy SHPO and Compliance Coordinator
Idaho State Historical Society
210 Main Street
Boise, ID 83702

Subject: Proposed Replacement of Spillway at Minidoka Dam, Minidoka Project, Idaho, Compliance with Section 106 and NEPA

Dear Ms. Pengilly:

The Bureau of Reclamation is proposing to replace the spillway and associated headgates at Minidoka Dam for the purpose of preventing structural failure of these features. Minidoka Dam was constructed in 1906 and placed on the National Register of Historic Places in 1974. The site is located on the main stem of the Snake River, about 18 miles northeast of the city of Burley, in south central Idaho (Enclosure 1). After over 103 years of continued use, the 2,142 foot spillway at Minidoka Dam has reached the end of its functional lifespan. The concrete that forms the spillway crest and the piers and stoplog structure show extensive visible deterioration at numerous locations. The headgate structures at the North Side Canal and South Side Canal also show serious concrete deterioration similar to that seen in the spillway.

Pursuant to section 102(2)(C)of the National Environmental Policy Act (NEPA) of 1969, as amended, Reclamation intends to prepare an Environmental Impact Statement (EIS) on the proposed Minidoka Dam Spillway Replacement. Alternatives currently being considered are No Action as required under NEPA, total replacement of the spillway and headgate structures, or replacement of just the spillway (Enclosure 2). Reclamation is requesting early public comment, tribal comments, and agency input to help identify significant issues or other alternatives to be addressed in the EIS. Information obtained during the scoping period will help in developing information to be included in the EIS. Reclamation plans to begin drafting the EIS in spring 2009.

This letter serves as notification to the Idaho State Historic Preservation Office that Reclamation would like to use the process and documentation required under NEPA to comply with the requirements of Section 106, as provided for under 36 CFR 800.8(c). In using the NEPA process for Section 106 purposes, Reclamation intends to meet the "*Standards for developing environmental documents to comply with Section 106,*" contained in Section 800.8(c)(1) of the regulations, as well as other requirements specified in 800.8(c)(2-5).

Please direct any questions about the above-stated intent to Dr. Ray Leicht, Archeologist, of my staff at 208-383-2215, or via e-mail at rleicht@pn.usbr.gov.

Sincerely,

JERROLD D. GREGG

Jerrold D. Gregg
Area Manager

Enclosures - 2

bc: SRA-1206 (Meuleman), SRA-6135 (Huang), SRA-6116 (Leicht) (w/o encls)

WBR:RLeicht:cwh:1/29/09:208-383-2215:SRA-6116
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United States Department of the Interior
BUREAU OF RECLAMATION
Snake River Area Office
230 Collins Road
Boise, Idaho 83702-4520

TAKE PRIDE IN AMERICA

AUG 2 6 2009

MSF-6116
LND/ENV-1.10

Ms. Suzi Pengilly
Deputy State Historic Preservation Officer
Idaho State Historical Society
210 Main Street
Boise, ID 83702

Subject: Memorandum of Agreement (MOA) for Minidoka Dam Spillway Replacement, Minidoka Project, Idaho

Dear Ms. Pengilly:

The Bureau of Reclamation has been consulting with your office over the replacement of the original spillway and headworks at Minidoka Dam, in south central Idaho. In accordance with 36 CFR 800.6 procedures, enclosed is a signed copy of the MOA which stipulates how the adverse effects of the planned spillway alterations will be mitigated. Reclamation appreciates your assistance in helping us to facilitate this Agreement.

You may direct any questions to Dr. Ray Leicht, Archaeologist, at 208-383-2215, or via e-mail at rleicht@usbr.gov.

Sincerely,

JERROLD D. GREGG

Jerrold D. Gregg
Area Manager

Enclosure

cc: Mr. Don Watts
Preservation Planner
State Historic Preservation Office
Idaho State Historical Society
210 Main Street
Boise, ID 83702
(w/encl)

bc: USF-2000 (Ketchum), MSF-6116(Leicht), MSF-6135 (Huang) (w/encl)

WBR:RLeicht:cwh:8/19/09:208-383-2215:MSF-6116
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Preserving America's Heritage

February 13, 2009

Mr. Jerrold D. Gregg
Area Manager
Bureau of Reclamation
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

REF: ***Preparation of Environmental Impact Statement (EIS) to Comply with Section 106***
Proposed Replacement of Spillway at Minidoka Dam, Minidoka, Idaho

Dear Mr. Gregg:

The Advisory Council on Historic Preservation (ACHP) recently received the Bureau of Reclamation's (BOR) notification for the referenced undertaking pursuant to 36 CFR § 800.8(c) of the ACHP's regulations, "Protection of Historic Properties" (36 CFR Part 800). We appreciate receiving your notification, which establishes that the BOR will use the process and documentation required for the preparation of an EIS to comply with Section 106 of the National Historic Preservation Act in lieu of the procedures set forth in 36 CFR §§ 800.3 through 800.6.

In addition to notification to the ACHP, the BOR must also notify the Idaho State Historic Preservation Officer (SHPO) and meet the standards in 36 CFR § 800.8(c)(1)(i) through (v) for the following:

- identifying consulting parties;
- involving the public;
- identifying historic properties and assessing the undertaking's effects on historic properties; and
- consulting regarding the effects of the undertaking on historic properties with the SHPO and Indian tribes that might attach religious and cultural significance to affected historic properties, with other parties, and the ACHP, where appropriate, during National Environmental Policy Act (NEPA) scoping, environmental analysis, and the preparation of NEPA documents.

The regulations do not specifically require that an agency submit an EIS to the ACHP. However, keep in mind that in the case of an objection from the ACHP or another consulting party, our regulations (at 36 CFR § 800.8(c)(2)(ii) and (c)(3)) provide for ACHP review of the EIS to (1) determine whether preparation of the EIS has met the standards set forth in 36 CFR § 800.8(c)(1) and/or (2) evaluate whether the substantive resolution of the effects on historic properties proposed in the EIS is adequate.

Should the BOR determine, in consultation with the SHPO, tribes, and other consulting parties, that its proposed undertaking may have an adverse effect on properties listed or eligible for listing on the National Register of Historic Places and/or that it will develop a Programmatic Agreement for this undertaking pursuant to 36 CFR § 800.14(b), we request that you notify us of this decision and provide adequate documentation for our review. We would also appreciate you providing in your cover letter the schedule for Section 106 consultation and a date by which you require a response by the ACHP. The ACHP's decision to review the EIS and participate in the development of a Memorandum of Agreement or Programmatic Agreement will be based on the applicability of the criteria in Appendix A of the ACHP's regulations.

Thank you for your notification pursuant to 36 CFR § 800.8(c). If you have any questions, or if you would like to discuss our comments, please contact Nancy L. Brown at 202-606-8582 or via e-mail at Nbrown@achp.gov.

Sincerely,

Charlene Dwin Vaughn

Charlene Dwin Vaughn, AICP
Acting Assistant Director
Federal Property Management Section
Office of Federal Agency Programs