

Appendix Y – Lessons Learned

TAB 1. Flood Response (Emergency Management)

TAB 2. Public Affairs (PAO)

TAB 3. Libby Operations

TAB 1. Flood Response (Emergency Management)

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 1

ISSUE TITLE: Field Team Readiness

DISCUSSION:

The Kootenai River Basin flood team consists of personnel from both the Libby Operating Project and the Seattle District Office. Primary team members have flood response experience, and received response training within the last year. The flood team conducts annual coordination meetings and field exercises within the Kootenai River basin which provide the opportunity for the team to network with local governments, review policy and procedures for the local and federal response, and conduct a brief overview of the condition of the river basins and identify potential areas of concern during a high water event.

In 2006, the flood team briefed locals on the Corps' flood response capabilities and procedures under PL 84-99. This pre-flood season coordination and training contributed to the effectiveness of this year's emergency response to the Spring flood event.

RECOMMENDATION:

The Corps will continue the annual coordination and training programs for the District flood teams and continue to coordinate closely with local governments throughout the year.

RESPONSIBLE OFFICE: Emergency Management

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 2

ISSUE TITLE: Flood Response Contracting Support

DISCUSSION:

The contracting support for this event was effective. Contracting Divisions Purchasing Branch has put together a database of available contractors for each river basin and assigned a purchasing agent to each flood team.

On Friday, May 19th, Purchasing Branch procured equipment, and material for the emergency levee repairs in Bonners Ferry and the contractor was able to mobilize and begin work that same evening. The assigned purchasing agents were available throughout the event to support their field teams.

RECOMMENDATION:

The Corps will review and update the emergency purchasing standard operating procedure (SOP) on a continuing basis. Contracting Division and Purchasing Branch personnel will receive annual flood procurement training.

RESPONSIBLE OFFICE: Contracting Division and EOC

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 3

ISSUE TITLE: Emergency Operations Center (EOC) Staffing

DISCUSSION:

The Emergency Operations Center (EOC) operations and staffing did not match the Corps' EOC operation plan in 2006. The Functional teams were under-staffed and team members were not familiar with their roles and responsibilities. There is not enough depth in team members experience and numbers to adequately staff the EOC for an extended duration. The Seattle District has not conducted an EOC exercise in several years.

RECOMMENDATION:

The Corps is committed to conducting annual EOC staff training. Each functional team will be adequately staffed and trained. EOC functional team guides and the EOC plan will be updated. EOC exercises will be conducted on a routine basis. In the future, the Corps will utilize the EOC plan during emergency response operations. Additional team members will be sought to provide appropriate personnel for EOC operations in the future,

RESPONSIBLE OFFICE: Emergency Management and Executive Office

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 4

ISSUE TITLE: Flood Response Communications (external)

DISCUSSION:

Clear communication between, the Corps' field team and the impacted Counties and Cities is very important during a flood fight event. In 2006, the Kootenai River valley locals used the incident command system (ICS), and the Corps' field team participated in daily meetings and kept the incident commander informed of Corps activities.

Initially the emergency operations center (EOC) was slow to inform the Idaho and Montana State Departments of Homeland Security of the flood response effort. After the first day, the EOC provided Situation Reports (SITREPS) to the States on a daily basis.

Libby Dam provided a daily conference call to share up-to-date information from the project with the local community. While this conference call was an effective means of providing information, the demand to participate in these calls initially exceeded the carrying capacity (20 individual lines) of the conference line.

RECOMMENDATION: In the future, the Corps will make contact with the impacted State as soon as the Corps is aware of a potential flood event. The Corps will continue to train and implement the ICS structure into Corps response activities and the EOC plan, as well as to provide daily updates to the States, in addition to the SITREPS. Emergency Management will also ensure that Libby Dam has the ability to adequately support conference calls during emergency situations

RESPONSIBLE OFFICE: Emergency Management Branch

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 5

ISSUE TITLE: Flood Response Communications (internal)

DISCUSSION:

The Division Reservoir Control Center (RCC) and the District emergency operations center (EOC) held daily conference calls throughout the Spring 2006 flood event which allowed the EOC to provide timely information to both the Corps field team and the locals. Daily weather forecasts were also provided to the team by email, and contributed to the effectiveness of the Corps' emergency response efforts. Many emergency field activities are driven by the latest weather forecasts, and if the field teams do not have the latest information, they lose their ability to be effective.

RECOMMENDATION:

The Corps will continue daily conference calls and emails between EOC and RCC during emergency events.

RESPONSIBLE OFFICE: Emergency Management Branch and RCC

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 6

ISSUE TITLE: Data Collection and Upward Reporting

DISCUSSION:

During the Spring flood event, the District did not conduct routine command management team (CMT) meetings and Commander Briefings. Emergency response communication and documentation was primarily sent via email and stored in an individual recipient's email folders. As a result of this practice, important data was not readily accessible to all who may have needed the information at a particular time.

The EOC needs to be aware of all flood related information since the EOC is the point of data collection for upward reporting within the Corps, and the repository for information from which emergency response decisions are made. Further, the EOC provides information to the Commander and the District command management team (CMT), and various other offices regarding the flood response activities on a regular basis through daily situational reports (SITREP), briefings, email messages, and phone calls.

RECOMMENDATION:

1. The EOC will provide copies of all relevant information in an easily accessible location for others within the district to access (whether in electronic format or by hard copy). Examples are SITREPs, Weather updates, RCC information, ongoing tasks, flood teams activated, and team members deployed.
2. EOC staff will be more diligent in completing conversation records for all calls and discussions for posting on the message board. This will ensure all information is available for staff and command use, and a complete legal record is kept.
3. The Seattle District Commander and the CMT will receive a briefing each day that the EOC is activated.

RESPONSIBLE OFFICE: Emergency Management

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 7

ISSUE TITLE: Bonners Ferry Flood Stage

DISCUSSION:

Most of the emergency response activities during the Spring flood event occurred when the Kootenai River was below the current flood stage of 1764 feet, as measure at the Bonners Ferry gage. Over-bank flooding threatened homes and public facilities in Bonners Ferry at stages lower than flood stage, i.e. approximately 1762 feet, due to potential failure of the right bank levee in May. At Kootenai River stages of 1762 or higher, failure of the right bank levee would have flooded homes, public facilities, and utilities in the Bonners Ferry community.

RECOMMENDATION:

The Corps has begun, and will continue to collect flood data and provide this and other information to the National Weather Service for their consideration in setting flood stage at Bonners Ferry.

RESPONSIBLE OFFICE: Emergency Management

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 8

ISSUE TITLE: Environmental Coordination during flood fight.

DISCUSSION:

During the Spring flood event, the EOC did not immediately directly reach a representative in the District's Environmental Resources Section (ERS). In accordance with ER 200-2-2, National Environmental Policy Act (NEPA) environmental coordination should be accomplished prior to initiation of emergency work, if time permits. Such environmental coordination may also be accomplished after the completion of emergency work. However, during the Spring flood event time constraints precluded accomplishment of environmental coordination prior to initiation of work

RECOMMENDATION:

Once there is a determination of an emergency flood fight, the EOC will directly contact a member of the ERS. ERS will be involved in initial field work to help provide engineers with advice concerning the environmental impacts associated with different design alternatives. Further, the State Historic Preservation Officer (SHPO) will also be contacted regarding the location and impacts of proposed work.

The Corps will review existing processes and modify as necessary to insure adequate environmental coordination before, during and after flood fight activities.

RESPONSIBLE OFFICE: Emergency Management / Environmental Resources Section

LESSONS LEARNED

CATEGORY: Flood Response

ISSUE NO. 9

ISSUE TITLE: Event Specific Information

DISCUSSION:

The following questions were raised by the Corps Headquarters (HQ) during the approval period for funding the District's flood fight response in 2006:

- Is the Corps operating under the approved rule curve?
- What was the available Flood Storage Capacity on the Thursday (May 18) prior to the beginning of the flood fight response?
- How much Flood Storage Capacity does Libby Dam have (as designed)?
- Was the reservoir elevation above the Storage Reservoir Diagram (SRD) prior to the event, and if so, why?

While the Corps' Headquarters's approved using PL 84-99 funds to help flood fight a damaged levee on the Kootenai River near Bonners Ferry, Idaho, they requested that a reservoir control analysis be conducted after the event. The primary concern was that funds provided under PL 84-99 authority are intended to provide flood fighting assistance, not necessarily to address impacts related to voluntary releases of flows to meet the Corps' ESA obligations. The following question needs to be addressed: If ESA responsibilities contribute to dam operations and flows that result in higher river stages - even when river stages are lower than the local flood control stage, and there are impacts to local water resources infrastructure, is PL 84-99 funding appropriate? In other words, HQ is asking the Northwestern Division to identify why the releases from Libby Dam were what they were, how much of the outflow was related to meeting ESA obligations, and how much of the flow was related to flood damage reduction operations (combined with additional runoff below the controlled area)? Also the Libby Dam reservoir elevations during this period should be addressed, specifically how much of the flood control storage capacity remained on Friday, May 19 and what was the predicted increase in inflow to the reservoir?

This year, the Corps began ramping up to full powerhouse on May 14, in part, to provide a stacked flow operation to meet the Corps' responsibilities under the ESA for listed Kootenai River white sturgeon, and to provide outflows under VARQ flood control operating procedures. Once impacts were observed locally in the form of imminent levee failure on May 16, the Corps could not meaningfully reduce outflows at that time due to flood damage reduction operations.

RECOMMENDATION:

The Corps is committed to improving internal communication (HQ, Division, District) concerning operational considerations (flood damage reduction, ESA responsibilities, as well as other operational objectives) for projects. The various Corps' offices, HQ, Division, and District, will discuss the policy of funding localized flood damage impacts related to project operations for the multiple purposes of the project that are within authorized range of operations.

RESPONSIBLE OFFICE: District and Division Emergency Management / Water Management

TAB 2. Public Affairs (PAO)

LESSONS LEARNED

CATEGORY: Public Affairs (PAO)

ISSUE NO. 1

ISSUE TITLE: COMMUNICATION

DISCUSSION:

During the spring run-off event the Libby Project staff was overwhelmed with answering public and media calls for information.

RECOMMENDATION:

One or more public affairs specialist(s) will augment the project staff and provide public affairs support during major events, on-site.

RESPONSIBLE OFFICE: Public Affairs

LESSONS LEARNED

CATEGORY: Public Affairs

ISSUE NO. 2 (PAO)

ISSUE TITLE: COMMUNICATION

DISCUSSION:

During the spring run-off event, water management information from Division was, at times, shared with local stakeholders (emergency responders), but not with Seattle District staff. While Division water management succeeded in conveying information out as quickly as possible to the emergency responders, this process can be improved in the future to ensure that all within the Corps are aware of the same information at the same time.

RECOMMENDATION:

The Seattle District and Northwestern Division will review existing communication processes to improve timely and effective communication with the entire Corps staff during emergency events.

RESPONSIBLE OFFICE: NWD Water Management/Public Affairs

LESSONS LEARNED

CATEGORY: Public Affairs

ISSUE NO. 3 (PAO)

ISSUE TITLE: COMMUNICATION

DISCUSSION:

During the spring flood event, better communication with federal agencies involved in the management of the Kootenai River Basin could have been facilitated with a current list of regional points of contact.

RECOMMENDATION:

Develop and maintain a list of federal contacts in the basin and keep updated at least once each year. Use the list to keep other agencies informed of the Corps activities in the basin.

RESPONSIBLE OFFICE: Public Affairs

LESSONS LEARNED

CATEGORY: Public Affairs

ISSUE NO. 4 (PAO)

ISSUE TITLE: COMMUNICATION – Public Information, Risk Communication, and Coordination

DISCUSSION:

The Corps communicated with many different stakeholders and the public concerning Libby Dam's planned operations this past Spring (for instance, on-going coordination with the Technical Management Team (TMT), the Sturgeon Recovery Team (SRT), the Canadian Entity under the Columbia River Treaty (BC Hydro), as well as through public forums such as the Kootenai Valley River Initiative (KVRI) and the Libby Dam annual operations meeting on May 10, 2006). The Corps has also hosted several public meetings in the Kootenai River valley over the last few years concerning proposed VAR-Q operations under the EA and EIS which provided information about the risks associated with certain proposed operations of Libby Dam.

Excerpts from two of the press releases that the Corps released this year are as follows:

On March 15, 2006 the Corps described the process for determining Libby Dam's Spring/Summer operation and associated risks in the following manner:

The Corps will use the completed flow plan protocol to determine whether Canadian Rocky snow pack, downstream tributary inflows, and Lake Koocanusa elevation will allow for additional releases from Libby of up to 35,000 cfs. As more is learned, the protocol will be updated to help the Corps determine the appropriate flow scenario for each of the next 10 years. It is possible that the Corps will spill water from Libby Dam beginning as early as late May of 2006. Residents could expect to see the moderate freshets they've seen for the last several years within current flood stage in non-flood management conditions. A shaped flow with spill would consist of up to 14 days of higher flow, not all of which are necessarily spill, and 21 days of gradually receding flow below powerhouse capacity. The higher flows would be completed by the end of June, and would not voluntarily exceed 35,000 cfs.

On May 9, 2006 the Corps further elaborated upon this Spring's planned operation by stating:

The U.S. Army Corps of Engineers plans to increase flows from Libby Dam to full powerhouse capacity (approximately 25,000 cfs) to coincide

with peak inflows below the dam, which may occur as early as mid-May, 2006. Flows will remain at full powerhouse capacity for up to 14 days, and will be followed by flows of up to 20,000 cfs. This operation is consistent with achieving the habitat attributes supportive of Kootenai River white sturgeon spawning and early life stage survival as recommended in the 2006 U.S. Fish and Wildlife Service Biological Opinion regarding the effects of Libby Dam operations on Kootenai River white sturgeon, bull trout and sturgeon critical habitat.

The Corps will not intentionally exceed elevation 1764' at Bonners Ferry from the dam unless required to do so for flood control purposes.

Despite the Corps' ongoing efforts in communicating with the public, Corps news releases and public meetings prior to the event did not adequately communicate the spectrum of potential risks or possible scenarios to the community that could occur with various Libby operations. The most effective means of communicating possible operational procedures and their associated range of risk(s) should be provided to the public and stakeholders (such as visual depictions and narrative format), and these communications should be developed by the District and Division teams (including Public Affairs Office). Additionally, when decisions are made that change the expected risks to the community, a process needs to be in place by which the stakeholders are informed of the decisions and the revamped range of risks associated with those decisions.

RECOMMENDATION:

While the Corps is does not have the authority to delegate its decision-making authority for Libby Dam operations, the Corps will better articulate what opportunities are available for public involvement within the Corps' existing decision-making process (e.g., the TMT). Existing forums for public and stakeholder involvement will be reviewed to determine their effectiveness and level of transparency. Future public communications from the Corps will better inform the public and stakeholders as to the risks associated with the multiple-purpose operation of Libby Dam in a clear and concise fashion (using visual aids along with narrative descriptions of operations and their associated risks). The process to inform stakeholders of the decisions and the revamped range of risks associated with those decisions will be improved and revised.

RESPONSIBLE OFFICE: Public Affairs/ Seattle District/ Northwestern Division

LESSONS LEARNED

CATEGORY: Public Affairs ISSUE NO. 5 (PAO)

ISSUE TITLE: **Flood Response Communications (external)**

DISCUSSION:

The field team provided effective communication with the impacted counties and cities, overall. The locals used the incident command system (ICS) and the field team participated in the daily meetings and kept the incident commander informed of Corps activities.

Initially the Emergency Operations Center (EOC) was slow to inform the Idaho and Montana State Departments of Homeland Security of the flood response. After the first day, the EOC provided Situation Reports (SITREPS) to the States on a daily basis.

Libby Dam personnel provided a daily conference call to share up-to-date information from the project with those in the local community. While an effective means of providing information, the demand to participate in these calls initially¹ exceeded the carrying capacity (20 individual lines) of the conference line.

RECOMMENDATION: Initiate contact with the impacted state as soon as the Corps is aware of a potential flood event. Provide daily updates to the appropriate state officials in addition to the SITREPS. Continue to train and implement ICS structure into Corps response activities and EOC plan. Ensure that Libby Dam has the ability to adequately support conference calls during emergency situations

RESPONSIBLE OFFICE: Emergency Management Branch

¹ The line capacity limitations were addressed subsequently.

TAB C. Libby Operations

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1

ISSUE TITLE: **VARQ Implementation**

DISCUSSION:

The 2006 event has raised questions concerning the Corps' operation of Libby Dam. The following discusses implementation of VARQ in 2006.

In order to assess the VARQ operation at Libby Dam in 2006, the Corps conducted a comparative evaluation using defined modeling assumptions and applying these to the 2006 water year. While both the 2002 Environmental Assessment (EA) and the Upper Columbia Alternative Flood Control and Fish Operations Environmental Impact Statement (UCEIS) contain the same VARQ Operating Procedures ("8 rules"), the EA and UCEIS contain different modeling assumptions used to represent alternative operations and analyze the impacts of those operations.

For the comparative analysis conducted for this AAR, the VARQ flood control (FC) Operating Procedures and the sturgeon flow templates contained in the respective EA or UCEIS (see Graphs 1-4) were used to depict possible operational scenarios in the 2006 water year. The primary difference in the modeling assumptions used for the EA and the UCEIS analysis is the date Libby Dam refill is initiated. For the EA, initiating VARQ refill outflows was assumed to be May 1 for all of the years. For the EIS, the refill start date varied for each year – defined by the Initial Controlled Flow (or ICF). For purposes of this analysis, the modeled fish flow template started powerhouse flows of 25,000 cfs on May 23 based on the 2006 Water Supply Forecast (WSF).

Applying the EA modeling assumptions, the VARQ FC only operation and the VARQ FC operation plus sturgeon flow templates, both resulted in spill operations with the 2006 water conditions. The EA VARQ FC with the sturgeon flow template (Graph - 2), shows that the amount of spill was approximately 3 kcfs, and the modeling indicated that the flood stage of elevation 1764 feet at Bonners Ferry would not have been exceeded. The EA VARQ FC only (Graph -1) shows that the peak amount of spill and the stage at Bonners Ferry would have been the same as what actually occurred in 2006.

Under the UCEIS modeling assumptions, the VARQ FC only operation (Graph - 4) resulted in spill operations of approximately 8 kcfs, while the VARQ FC with the sturgeon flow template (Graph - 3) resulted in full powerhouse flows with no spill under the 2006 water conditions. Again, the modeling using the UCEIS assumptions with and without fish flows resulted in river stages being below elevation 1764 feet.

These modeling analyses indicate that the risk of filling and spilling above powerhouse capacity is sensitive to the VARQ refill initiation date. As indicated in both the EA and UCEIS, inclusion of the spring fish flows would reduce the amount of spilling.

The Corps also conducted a similar preliminary analysis for water years 2003 through 2005 - the years interim VARQ was implemented previously. As with the 2006 water year analysis, the EA and UCEIS VARQ FC modeling assumptions and fish templates were applied to water years 2003 through 2005. In this analysis, the EA and UCEIS modeling assumptions were compared to actual operations and generally resulted in the following:

Water Year 2003:

- application of VARQ Refill Guidance in the modeling resulted in initiating VARQ outflows over 1 month earlier than outflows were actually initiated in 2003.
- the sturgeon flows, applying the flow template in the models, were provided in mid-May rather than the actual early June operation in 2003. (Sturgeon operations were initiated on June 1).
- the end-of-June reservoir elevation as modeled was about 8 feet lower than the actual 2003 reservoir elevation of approximately 2459 feet.

Water Year 2004:

- application of VARQ Refill Guidance in the modeling resulted in initiating VARQ outflows 1 to 1½ months earlier than outflows were actually initiated in 2004.
- the sturgeon flows, applying the flow template in the models, were provided in mid-May at full powerhouse rather than the actual operation beginning on May 29 of about 15 kcfs.
- the end-of-June reservoir elevation as modeled was about 15 to 20 feet lower than the actual 2004 reservoir elevation of approximately 2446 feet.

Water Year 2005:

- application of VARQ Refill Guidance in the modeling resulted in initiating VARQ outflows 10 to 15 days earlier than outflows were actually initiated in 2005.
- the sturgeon flows, applying the flow template in the models, were provided for approximately 20 days starting in mid-May at full powerhouse in contrast to the actual pulse that was initiated in mid-May, 2005.
- end-of-June reservoir elevation as modeled was about the same as the actual 2005 reservoir elevation of approximately 2458 feet.

As a result of this comparative analysis applying the EA and UCEIS modeling assumptions as applied to water years 2003 to 2006, and the information gleaned from various AAR chapters and appendices (e.g. Appendices K, L, M and W), there are several facets of the VARQ FC Operating Procedure that have been identified for further analysis to answer the following questions concerning VARQ implementation in 2006:

- (1) Are the VARQ FC Operating Procedures clear and understandable regarding drawdown and the calculation of outflows for the VARQ Refill Guidance, such that regulators would apply them consistently?
- (2) Is there an adequate process in place to assess risk and inform a decision to operate differently than recommended in the VARQ Refill Guidance in order to achieve any of the multiple objectives for Libby Dam?
- (3) Do the current VARQ FC Operating Procedures provide sufficient discretion or flexibility to adequately provide for system-wide and local flood damage reduction, and the habitat attributes for sturgeon as described in the 2006 USFWS BiOp (or flow operation modifications developed through adaptive management), and achieve the reservoir refill objectives for summer salmon flow augmentation and recreation?
- (4) Does the existing NEPA analysis for implementation of VARQ describe an adequate range of operations and analysis of associated impacts to meet multiple objectives?
- (5) How do we ensure that there is a clear and common understanding of the objectives of VARQ FC between and among the Corps, Tribes, States and other interested Federal agencies?

RECOMMENDATION:

As a result of the 2006 flood event and the examination of VARQ as implemented in water years 2003, 2004, 2005, and 2006, in this AAR, the Corps is committed to completing a detailed review to determine: (1) if the operations that actually occurred fell within the range of conditions anticipated and considered in the development of the VARQ FC Operating Procedures; (2) if the associated impacts of such operations are addressed in existing NEPA documentation; (3) if the Operating Procedures provide for the desired objectives for listed species, system-wide and local flood damage reduction, and other conditions such as levee failure, transmission outages, etc; (4) if there are ways to better address the flood control requirements during infrequent floods; and, (5) whether the relationship between the releases associated with VARQ Drawdown and Refill Procedures and the functioning of downstream non-federal levees is adequately understood. All aspects of implementation of VARQ including flood damage reduction, levee conditions, effects on listed species, resident fish, recreation, and water quality will be examined.

This analysis of the VARQ FC Operating Procedures will specifically address the extent of flexibility provided for in these procedures, which will be identified, clarified, and if appropriate, incorporated into the UCEIS. The anticipated impacts of the current VARQ FC Operating Procedures on residual risks to flood damage reduction and spill will be

identified and communicated to stakeholders and the public. The Corps will convey and coordinate the results of this analysis, and the ability and/or limitations identified to provide for the identified biological objectives for sturgeon, bull trout, resident fish and salmon, to NOAA Fisheries, USFWS, stakeholders, and the public.

It is important to note that the Corps is not authorized to delegate operational decision-making to others and is ultimately responsible for providing for an array of objectives, including compliance with federal statutes, regulations, and Treaty provisions. However, the Corps is committed to taking input from other entities and considering this information for decisions concerning the operation of Libby Dam.

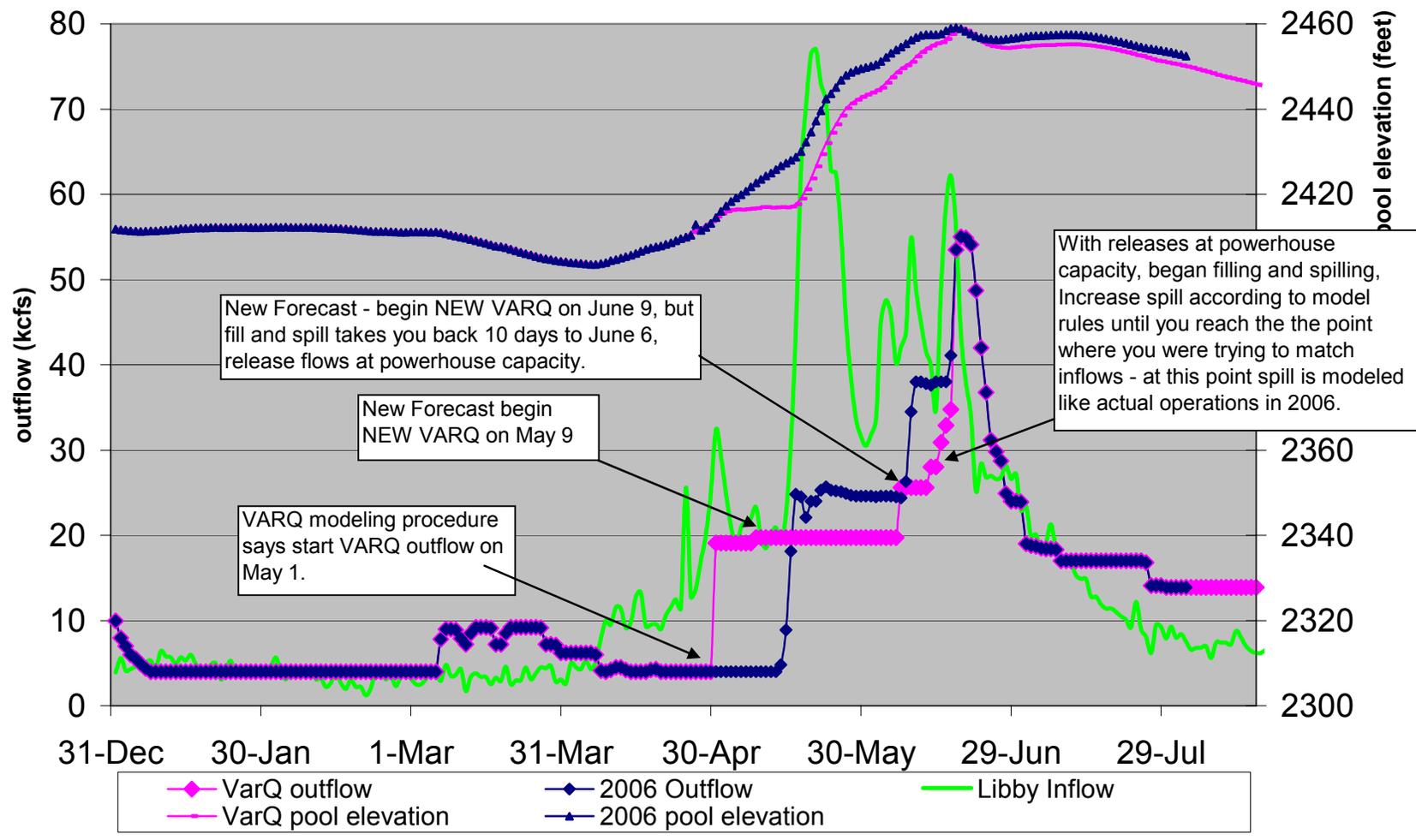
The Corps will implement recommendations in the following:

- VARQ Refill Guidance (Lesson Learned 1A)
- Modification Process to VARQ Flood Control Guidance (Lesson Learned 1B)
- NEPA documentation on VARQ (Lesson Learned 1C)
- Corps Northwestern Division and Seattle District Roles (Lesson Learned 1D)
- Libby Water Control Manual (Lesson Learned 1E)
- VARQ and ESA Operations (Lesson Learned 1F)

RESPONSIBLE OFFICE: Northwestern Division and Seattle District

LIBBY DAM - EA - 2006

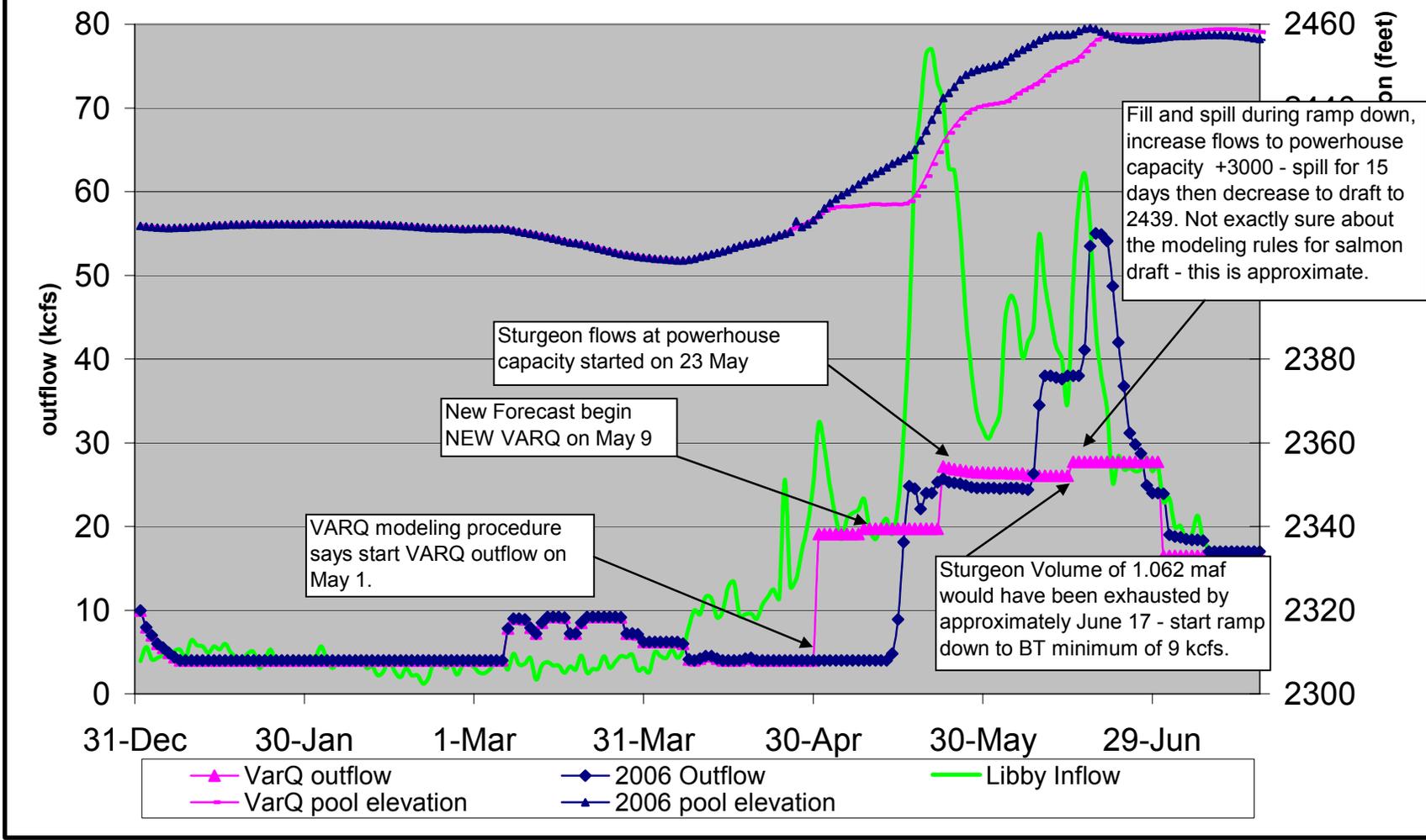
EA VarQ Modeling Procedures No Fish Flows



Graph 1 - EA no fish flows

LIBBY DAM - EA - 2006

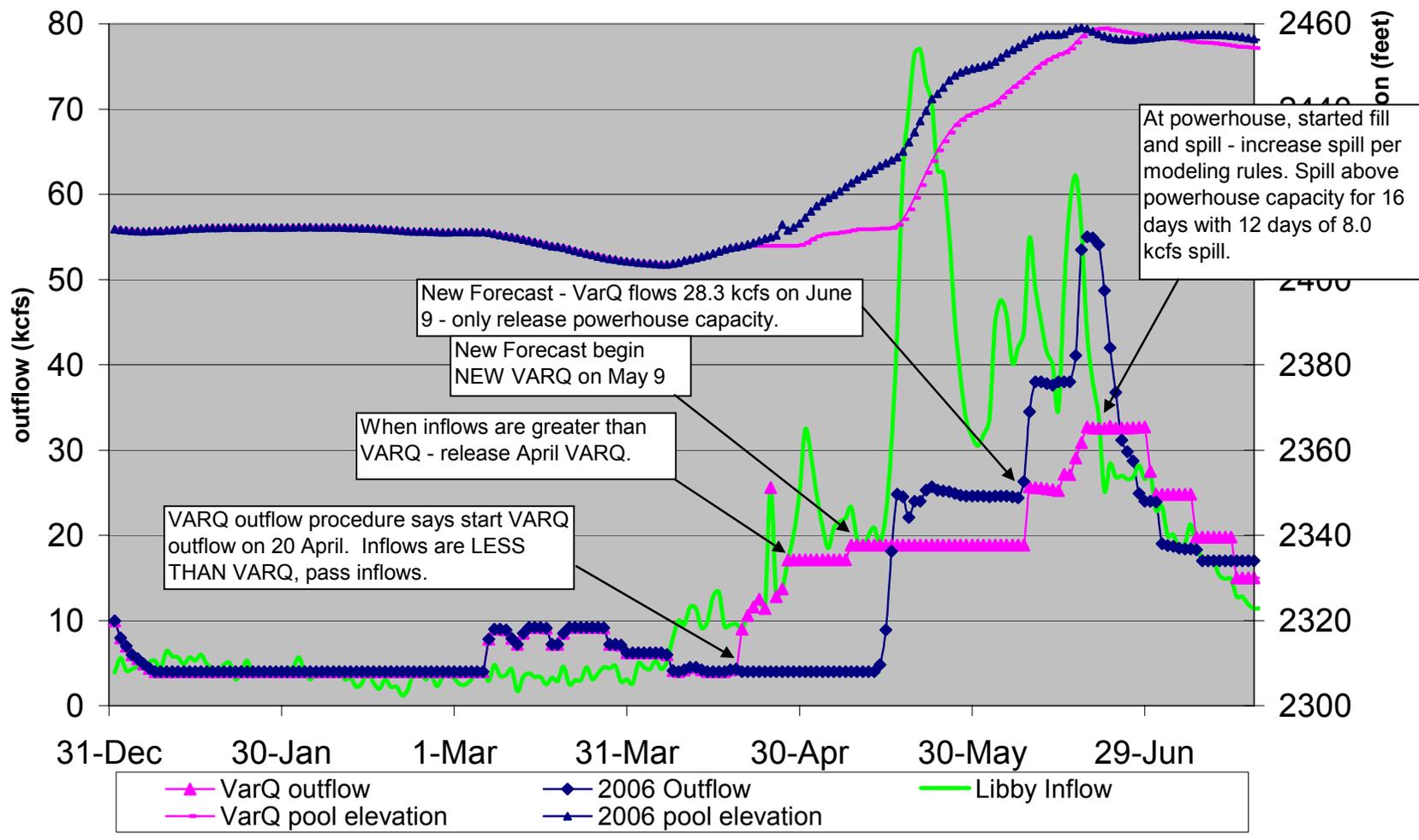
EA VarQ Modeling Procedures with Fish Flows



Graph 2 - EA with Fish flows

LIBBY DAM - EIS - 2006

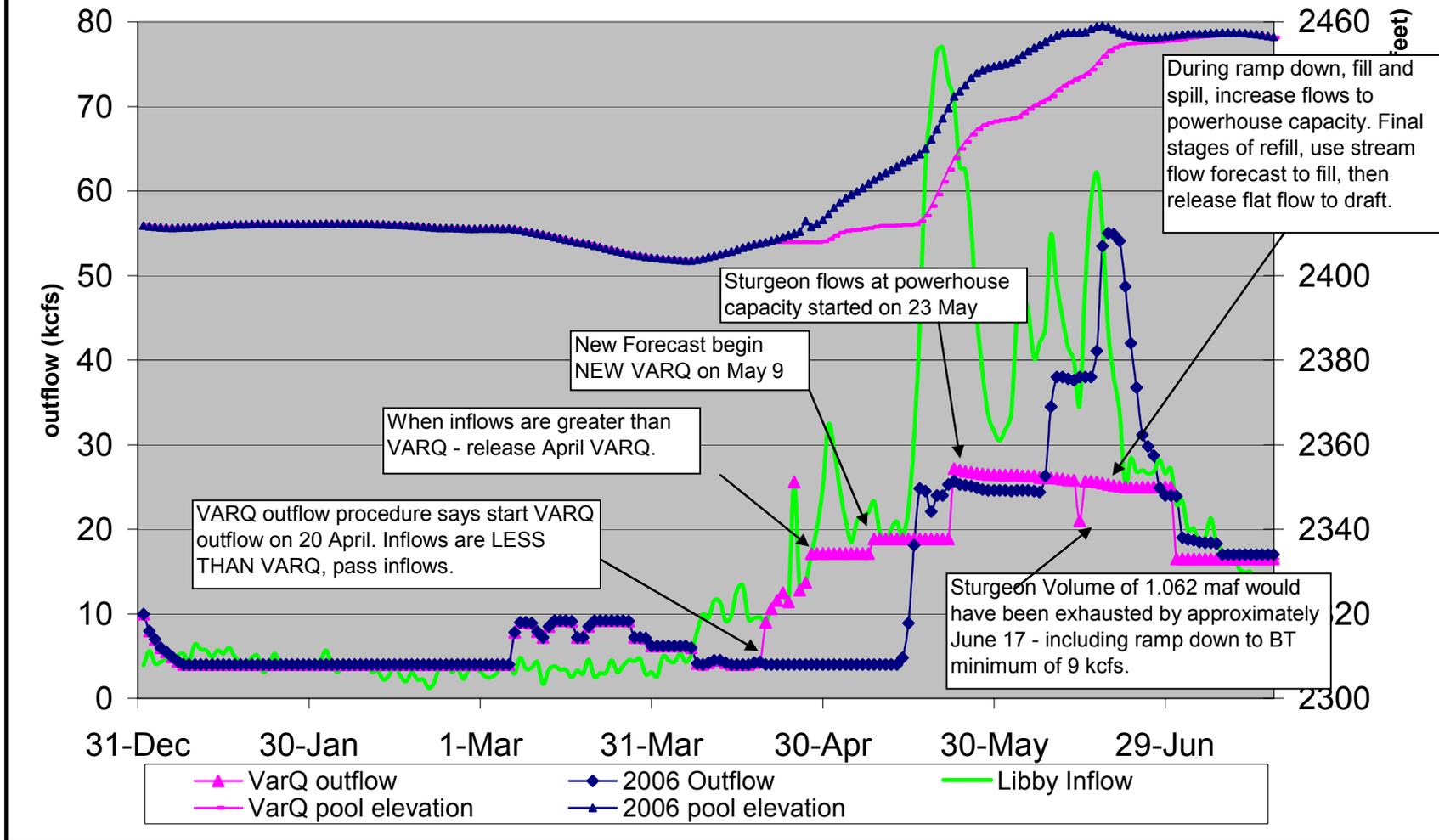
EIS VarQ Modeling Procedures No Fish Flows



Graph 3 - EIS no fish flows

LIBBY DAM - EIS - 2006

EIS VarQ Modeling Procedures with Fish Flows



Graph 4 - EIS with fish flows

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1A

ISSUE TITLE: VARQ Refill Guidance

DISCUSSION:

VARQ FC Operating Procedures (“8 rules”) discussed in the Environmental Assessment (EA) and UCEIS provide for development of “Drawdown Guidance” for operations during the drawdown period, typically January into April or early May; and, “Refill Guidance” for operations once the refill period begins, typically mid-April to mid-May. The VARQ Drawdown Guidance is based on Storage Reservation Diagrams (SRDs) that identify storage space for flood control from January through April by month based on monthly Water Supply Forecasts (WSF). The VARQ Refill Guidance is used to calculate outflows for Libby Dam, and is also based on the monthly WSF. In reviewing the VARQ Guidance issued in April and May 2006 for purposes of this AAR, the Corps has made the following observations:

- The April 2006 flood control guidance issued by HEB for Libby Dam included two components: the VARQ Drawdown Guidance and VARQ Refill Guidance (See Appendix K for guidance provided). The VARQ Drawdown Guidance identified an end-of-April target reservoir elevation for flood control storage space. The VARQ Refill Guidance identified Libby Dam outflows or releases.
- The VARQ FC Operating Procedures state that the VARQ Refill Guidance should be re-calculated monthly when new WSF are issued. However in 2006, VARQ Refill Guidance was issued more frequently - on April 19th, April 28th, May 11th, and May 25th.

Comparative Analysis:

For this AAR, the Corps compared actual 2006 operations with alternative scenarios. Table 1 below displays the comparison between the Libby Dam releases and reservoir elevations for: (1) the actual 2006 operations²; (2) the operations had the 2006 HEB Guidance, as shown in Appendix K, been strictly followed; and, (3) the operations applying the Calculated VARQ Refill Guidance³ outflows using the “8-rules.”

² The decision in 2006 to release 4 kcfs is discussed in Chapter 2 and Appendix K (Chronology).

³ Flows based on VARQ “8-rule” process.

Table 1

The modeling analysis of the two alternative scenarios, i.e. (2) HEB Guidance, and (3) Calculated VARQ, assume that no other factors would have influenced or modified these operations. Such other factors include for example, system-wide flood control concerns, downstream levee erosion, alternative sturgeon flow operations, or other considerations, such as power emergencies.

The results are similar for scenario (2) HEB Guidance and scenario (3) Calculated VARQ. The difference in Libby outflows in these scenarios is less than 2 kcfs, and the May 14th reservoir elevations are within 0.5 feet. In scenarios (2) and (3), the May 14th reservoir elevation would have been approximately 15 feet lower than the actual 2006 elevation. Scenarios (2) and (3) also had approximately 575 kaf more storage space available.

Assuming a May 15th implementation of stacked flow operations (powerhouse flows of 25 kcfs), it is anticipated that under scenario (2) or (3), there would have been no spill. These results are similar to the modeling results displayed in Lessons Learned Libby Operations Issue No. 1, Graph 3, using the UCEIS assumptions with fish flows.

Table 1

	Date	(1) 2006 Operations	(2) HEB Guidance ⁴	(3) Calculated VARQ ⁵
elevation (feet)	31-Jan	2412.3	2426.7	2426.7
elevation (feet)	28-Feb	2411.1	2412.1	2412.1
elevation (feet)	31-Mar	2404.3	2404.1	2404.1
elevation (feet)	30-Apr	2413.2	2417.0	2417.0
elevation (feet)	19-Apr	2407.66	2407.66	2407.66
flow (kcfs)	20-Apr	4	16.4	17.1
flow (kcfs)	29-Apr	4	16.4	17.8
elevation (feet)	30-Apr	2413.18	2408.17	2408.05
elevation (feet)	8-May	2421.76	2411.63	2410.95
flow (kcfs)	9-May	4	19.7	18.7
elevation (feet)	14-May	2426.63	2412.14	2411.64
Storage available	14-May	1400 kaf	1957 kaf	1975 kaf
flow (kcfs)	15-May	25	19.7 (Begin release of powerhouse 25.0 kcfs for fish flows)	18.7 (Begin release of powerhouse 25.0 kcfs for fish flows)
elevation (feet)	8-Jun	2455.36	2442.11	2441.29
flow (kcfs)	9-Jun	34.5	None ⁶	25
peak elevation feet	18-Jun	2459.1	estimate 2457	estimate 2457
peak flow (kcfs)	20-Jun	55	25	25

⁴ Flows based on HEB Guidance (Appendix K). Elevations assume these VARQ flows were released.

⁵ Flows based on VARQ “8-rule” process. Elevations assume these VARQ flows were released.

⁶ HEB did not issue guidance for this date.

Table 2

The VARQ Operating Procedures also provide a mechanism to make adjustments in subsequent Refill Guidance to account for differences in releases between the previously issued Refill Guidance and actual releases. The Corps assessed the sensitivity of exercising flexibility or “shaping” the outflows identified in the Refill Guidance by analyzing the following two scenarios: the operations applying Calculated VARQ Refill Guidance outflows using the “8-rules” (scenario (3) in Table 1), and (4) VARQ Adjusted to account for shaping flows or releasing outflows that are different than identified in the Refill Guidance.

Table 2 compares scenario (1) 2006 actual flows with scenarios (3) and (4). Scenario (3) Calculated VARQ, assumes that the Refill Guidance outflows identified for April 20th, April 29th and May 9th were released. As displayed, scenario (4) VARQ Adjusted, shows that releases would need to be increased over time to account for releasing less flow than identified under the VARQ Refill Guidance. Scenario (4) VARQ Adjusted, assumes 4 kcfs was released through May 14th. In scenario (3), the May 15th Calculated VARQ flows would have been 18.7 kcfs as compared to the actual 25 kcfs flows provided under the stacked flow operation in 2006. The scenario (4) May 15th VARQ Adjusted flow would be 27.7 kcfs as compared to the actual releases of 25 kcfs.

Table 2

	Date	(1) 2006 Operations	(3) Calculated VARQ ⁷	(4) VARQ Adjusted ⁸
elevation (feet)	19-Apr	2407.66	2407.66	2407.66
flow (kcfs)	20-Apr	4	17.1	17.1
flow (kcfs)	29-Apr	4	17.8	19.7
flow (kcfs)	9-May	4	18.7	24.2
flow (kcfs)	15-May	25	18.7	27.7

The scenario (4) May 15th VARQ Adjusted Refill Guidance outflows of 27.7 kcfs demonstrate a difference of approximately 2.7 kcfs more than the 25 kcfs actually released under the stacked flow operation for sturgeon. This 2.7 kcfs would be above powerhouse capacity requiring spill. The scenario (4) VARQ Adjusted outflows and the actual 2006 outflows reflect similarities in outcomes associated with using the flexibility provided for in the Refill Guidance.

This analysis also demonstrates, however, the sensitivity to and potential concerns about effects on reservoir storage space when exercising flexibility to shape flows as provided for in the VARQ Operating Procedures. Under both scenario (4)VARQ Adjusted Refill

⁷ Flows based on VARQ “8-step” process assuming VARQ flows are released.

⁸ Flows adjusted to reflect prior releases of 4.0 kcfs through the date of calculation.

Guidance, and the actual 2006 operations, approximately 575 kaf less storage space was available on May 15th. Table 1 shows that operating to VARQ Refill Guidance (without adjustments or shaping flows to accommodate other factors, e.g. system-wide flood control concerns, downstream levee erosion, alternative sturgeon flow operations, or power outages or emergencies), there would be 575 kaf of available storage and there would have been no spill in 2006.

This information points to the need for further evaluation of the risks associated with exercising flexibility to shape flows, and the risks associated with constraining this flexibility. As was described in Lessons Learned Libby Operations Issue No. 1, in water years 2003 through 2005, flexibility was employed during the refill period, which enabled an outcome that better met the multiple objectives for Libby Dam.

RECOMMENDATION:

The Corps will further review, examine, and clarify the technical issues identified in this analysis. The Corps is committed to reviewing and revising the processes and procedures for issuing VARQ Refill Guidance to: (1) incorporate the actual reservoir releases and ensure system conditions are adequately addressed; (2) provide for issuance of Guidance on a weekly basis during the refill period; (3) clarify priorities between the VARQ Drawdown Guidance and VARQ Refill Guidance; (4) modify the description of the VARQ Operating Procedures to clearly define the start date for refill; and, (5) make more explicit that using streamflow forecasts to adjust VARQ flows applies only when The Dalles forecast is less than 85 MAF.⁹

This review will address all water years since interim VARQ was initiated in 2003 and will review the modeling conducted to analyze VARQ. Changes in processes and procedures that result from these efforts will be incorporated, if appropriate, into the UCEIS.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District Water Management

⁹ This was not an issue in the 2006 operations, in this post season review examining the VARQ Refill Guidance (8-rules), this concern has been noted and determined that the recommended change needs to be incorporated.

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1B

ISSUE TITLE: Modification Process to VARQ Flood Control Guidance

DISCUSSION:

As stated in the 2006 Chronology - Appendix K, releases in late April and early May differed from the outflows identified in the VARQ Refill Guidance. As has been done in years 2003 through 2005, RCC shaped flows at Libby Dam with the intention of achieving multi-purpose objectives for system-wide and local flood damage reduction, listed species and other project uses. In making real-time operational decisions in 2006, including assessment of risk, the tools utilized by RCC included the ESP inflow forecast and ESP HYSSR model runs as described in the Chronology - Appendix K.

The Corps' Northwestern Division has a process in place for all federal (including the Corps) and non-federal dam operators to request a modification (commonly referred to as a "deviation request") to operate differently than what is identified in the Flood Control Guidance issued by HEB. The Northwestern Division's current process for a deviation request states that a risk assessment is necessary to make an informed decision on whether a modification of operations is appropriate.

RECOMMENDATION:

A timely risk assessment to address real-time conditions will be developed to address requests for modifications from the Flood Control Guidance, including VARQ Refill Guidance. The Corps will conduct a review of the current process to ensure that a risk assessment can be performed quickly and be responsive to actual seasonal conditions. The review will address the extent to which system operations for flood control should be included in the risk assessment, and if so, how such system operations like Grand Coulee should be included in the risk assessment.

Tools used to assess risk in 2006 will be reviewed, and an explicit risk assessment process be adopted by the Corps (Columbia Basin Water Management Division and Seattle District) and the RFC. The modification process will include appropriate coordination and communication with the District with responsibility for emergency and environmental responders.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District Water Management in conjunction with the RFC.

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1C

ISSUE TITLE: NEPA Documentation on VARQ

DISCUSSION:

As a federal agency, the Corps must comply with the National Environmental Policy Act (NEPA). NEPA is intended to ensure that decisions about federal actions are made after decision-makers have fully disclosed the environmental consequences of an action.

The following discussion describes the existing NEPA documentation for implementation of VARQ. On December 31, 2002, the Northwestern Division Commander signed a Finding implementing VARQ at Libby Dam on an interim basis. This Finding was based on a Decision Document on Upper Columbia River Alternative Flood Control and Fish Operations Interim Implementation, dated December 2002, and a Finding of No Significant Impact (FONSI) based on an analysis of potential impacts of interim VARQ implementation in the Environmental Assessment (EA). The decision was to implement interim VARQ was based on the benefits to listed species and that implementation of VARQ FC was an action that could be changed in subsequent years if additional information became available to warrant re-consideration.

The Corps has been preparing an Environmental Impact Statement, the Final Upper Columbia Alternative Flood Control and Fish Operation EIS (UCEIS), which examines a range of alternatives for long-term operations. The Final UCEIS was released for public review and comment in April 2006, just prior to the 2006 flood event. The Corps has not yet issued a Record of Decision on long-term Libby Dam operations, in part due to the evaluation of 2006 operations as addressed in the AAR.

Both the EA and UCEIS included operational constraints such that the Corps would not voluntarily exceed elevation 1764 feet as measured at Bonners Ferry, Idaho. The UCEIS also included an assessment of the levee conditions around and downstream of Bonners Ferry. A review of this information is necessary considering the impacts on levees when river stages were below elevation 1764 feet during the 2006 operations. As a result of the 2006 event, information will be available concerning levee conditions, impacts to resident fish below Libby Dam, and the Kootenai River white sturgeon response to the 2006 flows.

Data have been collected on the impacts to resident fish below Libby Dam as a result of the spill operations at Libby Dam in 2006. Data on sturgeon movement in 2006 is also

available. This information will be evaluated and the UCEIS information updated as appropriate. Sturgeon templates used in modeling will be reviewed to address information obtained on sturgeon habitat requirements (depth, velocity, temperature) as identified in the 2006 USFWS BiOp.

Further analysis will be conducted concerning the probability of reservoir refill (increase or decrease from that reported in the EA and/or EIS), system-wide and local flood damage reduction, and spill when implementing VARQ Refill Guidance in accordance with the “8-rules,” with and without flexibility. Other impacts associated with VARQ implementation as carried out in 2003 through 2006 will also be considered.

RECOMMENDATION:

The Corps will review information concerning levee conditions, impacts to resident fish below Libby as a result of the spill operation, the sturgeon response to the flows and habitat conditions, and other relevant information obtained from the 2006 flood event. The effects addressed in the final UCEIS will be reviewed in light of information obtained from the 2006 event.

The Corps’ review will address assumptions made in the UCEIS concerning system operations for flood control, effects on all project uses, and compliance with applicable laws and regulations. In particular, prior to adoption of VARQ FC on a long-term basis, the Corps will clarify the extent of flexibility provided for in the VARQ Operating Procedures Refill Guidance, review the effects associated with implementing VARQ in accordance with that defined extent of flexibility, and articulate this residual risk to the public.

The Corps will assess the range of operations available for 2007 and make a determination if the effects are appropriately addressed in the EA.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District Planning and Project Management, Engineering and Construction and Operations Divisions

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1D

ISSUE TITLE: Corps Northwestern Division and Seattle District Roles

DISCUSSION:

Responsibilities for regulating Libby Dam are described in the Water Control Manual (dated July 1984) as well as Regulation NPDR 1165-2-2 (dated 2 January 1990).

Water Control Manual, July 1984.

Direct responsibility to regulate the Libby project for its authorized purposes is assigned to the Columbia Basin Water Management Division of the Northwestern Division (NWD) which coordinates and cooperates with many other agencies and groups to accomplish effective and efficient operation. Planning seasonal regulation and directing day-to-day regulation of Libby Dam are the responsibility of the Reservoir Control Center (NWD) in consultation with the Hydrologic Engineering Branch and Power Branch of the NWD Water Management Division and with the Seattle District Engineer through the Hydrology and Hydraulics Branch of Engineering Division. The Water Control Manual identifies NWD as the primary regulator, with NWS as the secondary regulator.

NPDR 1165-2-2, Water Resource Policies and Authorities, WATER MANAGEMENT RESPONSIBILITIES, 2 January 1990.

This document clarifies the organizational structure and defines the specific responsibilities for the Division, Districts and project offices. The Northwestern Division is responsible for primary regulation and the Seattle District is responsible for secondary regulation of the Libby project. Preparation of After Action Reports for water management actions pertaining to Libby Dam are the responsibility of the Northwestern Division.

- Primary regulation responsibility is the lead for day-to-day regulation of the project, or coordination required to regulate the project. This involves frequent monitoring of the project, issuing operating instructions, and personal contact with project operators. It also involves the analysis required to make regulating decisions.

- Secondary regulation means periodic regulation responsibilities along with continuous monitoring of the project's operation. This includes responsibility for maintaining surveillance of a project's regulation to provide information to others and to participate in periodic coordination that may be necessary.

Offices in both NWD and NWS have responsibility to coordinate Libby Dam operations with other entities and monitor operations, respectively. For instance, development of the Protocol concerning flow operations for sturgeon involved Libby Project, Seattle District and Northwestern Division offices. Another example is in the preparation of NEPA documentation for VARQ FC, which had an integrated Division/District team to address the system and local effects associated with different alternatives.

RECOMMENDATION:

The Corps will identify a systematic approach for ensuring that all parties on the Corps' regional team have a common understanding of planning protocols and operational requirements and are communicating on a regular basis to discuss upcoming operations and any potential modifications.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1E

ISSUE TITLE: Libby Water Control Plan and Water Control Manual

DISCUSSION:

The operation of Libby Dam is guided by several planning documents including the Libby Water Control Manual and Libby Water Control Plan. Corps Engineering Regulations (ER 1110-2-240) require a water control manual be prepared for each Corps project. The sections of the regulations stated below generally describe the contents of the water control manual/plan, the need to update the manual/plan as conditions change and the requirement to develop revisions in coordination with public.

Water control plans will be developed for reservoirs, locks and dams, deregulation and major control structures and interrelated systems to conform with objectives and specific provisions of authorizing legislation and applicable Corps of Engineers reports. They will include any applicable authorities established after project construction. The water control plans will be prepared giving appropriate consideration to all applicable Congressional Acts relating to operation of Federal facilities, i.e., Fish and Wildlife Coordination Act (P.L. 85-624), Federal Water Project Recreation Act-Uniform Policies (P.L. 89-72), National Environmental Policy Act of 1969 (P.L. 91-190), and Clean Water Act of 1977 (P.L. 95-217). Thorough analysis and testing studies will be made as necessary to establish the optimum water control plans possible within prevailing constraints.

ER 1110-2-240 6. a. at p. 2.

Water control plans developed for specific projects and reservoir systems will be clearly documented in appropriate water control manuals. These manuals will be prepared to meet initial requirements when storage in the reservoir begins. They will be revised as necessary to conform with changing requirements resulting from developments in the project area and downstream, improvements in technology, new legislation and other relevant factors, provided such revisions comply with existing Federal regulations and established Corps of Engineers policy.

ER 1110-2-240 6. c. at p. 2.

Water control plans will be developed in concert with all basin interests which are or could be impacted by or have an influence on project regulation. Close coordination will be maintained with all appropriate international, Federal, State, regional and local agencies in the development and execution of water control plans. Effective public information programs will be developed and maintained so as to inform and educate the public regarding Corps of Engineers water control management activities.

ER 110-2-240 6. i. at p. 4.

The Libby Dam and Lake Koocanusa Project Water Control Manual, dated July 1984, was prepared in accordance with ER 1110-2-240. The manual for Libby Dam has not been formally updated since 1984, however, many incremental modifications to Libby Dam operations have been made, including interim VARQ implementation, variable end-of-December draft as identified in the 2000 USFWS and NOAA BiOps, end-of-August draft limits for salmon flow augmentation per the 1995, 2000, and 2004 NOAA BiOps, and sturgeon flow requirements under the 2000 and 2006 USFWS BiOps. These are addressed in the Corps Annual Water Management Plans prepared in accordance with the BiOps noted above. The Libby manual was scheduled for updating once an UCEIS alternative was selected.

RECOMMENDATION:

The Corps will review the procedures for updating the Water Control Manual in a timely manner, as appropriate. An updated Water Control Manual is a better source for informing District and Division staff as to operational modifications.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District Water Management

LESSONS LEARNED

CATEGORY: Libby Operations ISSUE NO. 1F

ISSUE TITLE: VARQ and ESA Operations

DISCUSSION:

As a result of the 2006 event, the Corps is taking a look at whether the current VARQ Operating Procedures adequately provide for multiple operational objectives for Libby Dam – primarily system and local flood damage reduction, and ESA requirements for listed Kootenai River white sturgeon, salmonids, and bull trout. The following discussion provides background information on the objectives for meeting the Corps’ Endangered Species Act (ESA) responsibilities and how these factor into real-time decision making.

In accordance with the ESA, the Corps, in conjunction with BPA and the Bureau of Reclamation (“Action Agencies”), has consulted with NOAA Fisheries and USFWS on the effects of the operation of the FCRPS projects on listed species since the early 1990s. Implementation of VARQ has been included in the Reasonable and Prudent Alternatives (RPA) of both the NOAA Fisheries and USFWS Biological Opinions (BiOps).

NOAA Fisheries and USFWS identified their expectations of the benefits of VARQ in December 2001 stating: “More water can be stored at Libby during average and below average water years to provide a more normative spring hydrograph and augment summer flows for the benefit of white sturgeon, bull trout, salmon and steelhead, and westslope cutthroat trout without compromising reservoir refill.”

NOAA Fisheries objectives for listed salmonids:

The NOAA Fisheries 2000 BiOp identified the objective of operating storage reservoirs to provide as much water as possible for salmon flow augmentation – particularly in the summer. RPA Action 18 stated:

The Action Agencies shall operate the FCRPS during the fall and winter months in a manner that achieves refill to April 10 flood control elevations, while meeting project and system minimum flow and flood control constraints before April 10. During the spring, the Action Agencies shall operate the FCRPS to meet flow objectives and *refill* the

storage reservoirs (Albeni Falls, Dworshak, Grand Coulee, Hungry Horse, and Libby) *by approximately June 30.*

If both these objectives cannot be achieved, the Technical Management Team will make an in-season decision, weighing considerations unique to each particular year. Because research results indicate that flow augmentation has more direct survival benefits for summer than spring migrants, *modest reductions in spring flows to facilitate reservoir refill would generally be preferable to refill failure.*

Operating the storage reservoirs to their upper (flood control) rule curve by April 10 will provide a more natural hydrograph and will increase the likelihood that spring flow objectives will be met *and reservoirs refilled by June 30. Having reservoirs full on or about June 30, when natural runoff declines, results in the greatest amount of water available for the summer migration period...*

NOAA Fisheries 2000 BiOp at p. 9-61- 9-62. (emphasis added).

The NOAA Fisheries 2000 BiOp continues with the following discussion of Libby Dam in particular: “Libby may refill later than the June 30 objective, e.g., early July, if necessary to avoid spill that would exceed the state water quality standard for TDG.” NOAA Fisheries 2000 BiOp at 9-63. The NOAA Fisheries 2000 BiOp continues:

VARQ reduces system flood control drafts at Libby and Hungry Horse reservoirs in years when flood control risks are moderate (average to below-average water years) and adds about 10,000 cfs to summer flows at McNary Dam without increasing flood risks... The VARQ concept is a change in system flood control developed by the Corps (1991, 1995, 1997, and 1999d) in response to NWPPC’s 1984 Fish and Wildlife Program (NWPPC 1984), the 1995 FCRPS Biological Opinion, and requirements for Kootenai River sturgeon and bull trout imposed by USFWS (1995, 2000a). Conformance with these biological opinions resulted in discharges from Libby Dam during the annual reservoir refill period that far exceeded those envisioned in existing flood control operating plans. *These fishery operations can reduce the likelihood and frequency of refill, adversely affecting the availability of augmentation water...The VARQ concept responds to all these biological opinion requirements.*

NOAA Fisheries 2000 BiOp at p. 9-66. (emphasis added).

The Final Updated Proposed Action¹⁰ (UPA), which was considered and found to avoid jeopardy to listed salmon and steelhead in the NOAA Fisheries 2004 BiOp, included

¹⁰ For the remand, the Action Agencies and NOAA Fisheries agreed that the actions to be analyzed for the new BiOp would be based upon the same actions called for in the 2000 BiOp’s Reasonable and Prudent Alternative (RPA), which NMFS concluded would avoid jeopardy to the listed salmon and steelhead. The

implementation of VARQ and refill of Libby Dam by about June 30th to provide water for salmon flow augmentation in July and August.

USFWS objectives for listed Kootenai River white sturgeon and bull trout:

The USFWS 2000 BiOp RPA discusses the objectives for ensuring adequate water available for sturgeon spawning, incubation, and recruitment:

The existing operations of Libby Dam have greatly reduced the quantities of water available to spawning and early life stages of sturgeon during the spring, and significant recruitment has not occurred for 26 years. The RPAs listed below are intended to modify operations of Libby Dam to assure storage of water specifically allocated for augmentation of Kootenai River flows during sturgeon spawning and development during early life stages. This stored water is necessary to allow the sturgeon to again reliably reproduce.

USFWS 2000 BiOp at p. 71. The BiOp RPA continues:

Beginning October 2001 the action agencies shall store water under VarQ and supply, at a minimum, water volumes during May, June and July based upon a water availability or “tiered” approach as modified from the final Sturgeon Recovery Plan... *This shall be in addition to storage needs for listed bull trout, salmon, and the 4,000 cfs minimum releases from Libby Dam.* Accounting on these total tiered volumes shall begin when the Service determines benefits to conservation of sturgeon are most likely to occur. This may include releases timed to enhance survival of eggs, yolk sac larvae, or larvae reared under the preservation stocking program and released into the Kootenai River. Releases may be timed to serve both wild fish and hatchery eggs/fish. Sturgeon flows will generally be initiated between mid-May and the end of June to augment lower basin runoff entering the Kootenai River below Libby Dam.

USFWS 2000 BiOp RPA 8.1.d. at p. 72

The USFWS 2006 BiOp RPA reaffirmed the USFWS position on continuing implementation of VARQ.

Current caselaw interpretation of ESA requirements:

The NOAA Fisheries and USFWS Biological Opinions and their implementation by the Corps and the other Action Agencies have been repeatedly challenged in court since the early 1990s by parties representing a range of interests from environmental groups to industry to State and Tribes. The NOAA 2000 and 2004 Biological Opinions were

Action Agencies updated the RPA actions and prepared the Final Updated Proposed Action (UPA), which was submitted to NOAA Fisheries on November 24, 2004.

successfully challenged, and the District Court has twice ordered a remand to produce a Biological Opinion that complies with the ESA. A recent opinion illustrates the courts' concerns when examining actions taken pursuant to the federal agencies' ESA obligations. Citing the Supreme Court's leading case interpreting the ESA, Tennessee Valley Authority v. Hill (TVA v. Hill), 437 U.S. 153, 184 (1978), the Court stated:

In fact, NOAA, BOR, the Corps, and BPA have repeatedly and collectively failed to demonstrate a willingness to do what is necessary to "halt and reverse the trend toward species extinction [in both the Columbia and Snake River Basins] whatever the cost." Tennessee Valley Authority v. Hill (TVA v. Hill), 437 U.S. 153, 184 (1978).

American Rivers et al. v. NOAA Fisheries et al., No. 04-00061-RE, Opinion and Order of Remand, at 5 (D. Or. September 26, 2006). The Court continues:

Instead of looking at what can be done to protect the species from jeopardy, [NOAA] and the action agencies [appear to be] narrowly focus[ing] their attention on what the establishment is capable of handling with minimal disruption." IDFG v. NMFS, 850 F.Supp at 900 (emphasis in original)...

...Federal Defendants' position appears to be inconsistent with the Supreme Court's admonition that the ESA reflects Congress' explicit "decision to require agencies to afford first priority to the declared national policy of saving endangered species." TVA v. Hill, 437 U.S. at 185 (emphasis added). The Supreme Court made clear that the language, structure, and history of the ESA reveals "a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies." Id.

American Rivers et al. v. NOAA Fisheries et al., No. 04-00061-RE, Opinion and Order of Remand, at 7 (D. Or. September 26, 2006).

Observations:

Public safety is the Corps' primary concern and first priority. Storage projects, such as Libby Dam, were designed to reduce damaging local and system floods. They also impact listed species. Consequently, the Corps is also responsible for avoiding jeopardy to these species when operating its projects. As discussed in various chapters and appendices in this AAR, meeting desired objectives for listed species factored into real-time decision making in 2006.

As a result of the flood event, the Corps conducted a preliminary review of interim VARQ in water years 2003 to 2005, which indicates that without using flexibility to shape outflows when implementing VARQ, the objective of refilling Libby to provide summer flow augmentation for salmon and steelhead would have been compromised. On the other hand, the review of the 2006 flood event demonstrates that shaping outflows in

this water year resulted in unprecedented Libby Dam releases of 55,000 cfs, with approximately 31,000 cfs of spill.

These analyses identify an issue as to whether the existing VARQ Operating Procedures adequately provide for multiple objectives, specifically system and local flood damage reduction *and* a more normative spring hydrograph for white sturgeon (flows, temperatures, etc.), and reservoir refill by about June 30 or early July for summer salmon flow augmentation

As in Lesson Learned Libby Operations No. 1A, this information points to the need for further evaluation of the risks associated with implementation of VARQ. Specifically, the Corps will consider any implications to flood damage reduction related to operational adjustments, such as shape and timing of operations for listed species.

RECOMMENDATION:

The Corps is committed to reviewing and re-assessing the effects of implementing VARQ FC with and without flexibility to provide for system and local flood damage reduction and the desired objectives for listed species as expressed by the USFWS and NOAA Fisheries. The Corps will provide this information to the USFWS and NOAA Fisheries and discuss mechanisms to ensure that the Corps' flood damage reduction responsibilities are not compromised, while meeting the intent of those agencies in their respective BiOps and Incidental Take Statement provisions. The results of these analyses and coordination efforts will, if appropriate, be incorporated into the UCEIS and provided to the public.

RESPONSIBLE OFFICE: Northwestern Division and Seattle District