

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 30, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Operations Update

Tony Norris, BPA, reported that the FCRPS would begin lack of market spill later today due to the wet and warm conditions and that BPA would follow the current Spill Priority List that was linked to the agenda item below. He noted that it was unusual to be spilling this early in the season. He also shared that Grand Coulee would be drafted ‘heavily’ for flood control.

SOR 2011-01

Glenn Vanselow, Pacific Northwest Waterways Association, presented an SOR for MOP+2 operations at Lower Granite starting in April to address safety and economic navigation concerns in the navigation channel and ports in the area. The SOR describing the request and justification had been posted prior to today’s meeting. Glenn suggested this request was being submitted as an interim operation until ports were able to request dredging in the area; dredging had been authorized during settlement negotiations in 2005 but was not moving forward because the development of a COE Sediment Management Plan (which would provide the necessary guidance) had not been completed due to lack of funding. Glenn introduced Brian Fletcher and Craig Nelson of Tidewater Barge Lines who shared additional technical information and answered TMT questions:

- In past years, similar requests have been made for MOP+1 operations. Why the need for MOP+2? Response: Additional encroachment issues and limited depth at the docks, causing safety hazards and property risks, are unique to this year. When we brought this issue to TMT in November, we had suggested MOP+2 would be the request; we were surprised not to see anything in the Fish Operations Plan about this. We found severe sediment turned up at 734.59 feet, indicating the need for a MOP+2 pool.
- With higher flows in the system, is there still a need to provide the additional pool elevation? Response: Regardless of flow, pool elevations are needed for safe maneuverability of the vessels. Mud, sediment and debris are still issues regardless of flow conditions.
- Can you expand on the safety concerns that are noted in the SOR? Response: With no under-keel space below the barges and boats, and with a narrower channel within which to move, maneuverability is challenging and wear and tear occurs on the

equipment. While no vessels have gotten ‘stuck’ yet, sinking, blocking the channel, and risk of breaching are all possibilities – we feel we are at the edge of the safety margin.

- Is the problem in the navigation channel or at the ports? Response: Both.
- Is light loading an option? Response: It would resolve some of the barge issues, but not the boat issues. Also, it would cause economic hardship on an already strained process given the extended lock outage at Lower Granite Dam last year.
- Is the problem alleviated with more use/traffic? Response: To some degree, however the sediment just gets shifted to another part of the channel, so the problem gets pushed to different areas.
- What is the frequency of use/schedule for navigation? Response: It is sporadic and variable, with grain transport happening now until June and log transport starting in mid-May.
- What is the long term remedy? COE Response: Dredging, guided by the Programmatic Sediment Management Plan. A Record of Decision on this is estimated to be completed by December 2012.
- Are there other alternatives? COE Response: The COE could explore options for pursuing an ‘emergency dredging’ option that would allow this action without finalization of the Sediment Management Plan, but that would not likely address the concerns for this year.
- How can the COE implement this request, given the state of the FCRPS litigation and court ordered operations? COE Response: All guiding documents allow for adaptive management changes, particularly if regional consensus is reached on an alternative operation. The COE plans to take the input from today, hear from its internal navigation experts and provide an opportunity for input from RIOG before making a decision.

TMT members acknowledged the safety and economic concerns being raised by the tow boaters and other navigation communities who have been impacted by the narrow and shallow conditions in the Lower Granite navigation channel areas. That said, they also raised concerns for the impacts that the operation being recommended would have on migrating listed fish, and the uncertainties around the court process that is guiding most operations this year.

Next Steps/Action: Steve Barton, COE, said the COE would work internally and with the RIOG to make a decision regarding this request. That decision will be made by the end of this week, prior to next week’s scheduled start of MOP operations.

Update: Steve Barton emailed the proposed operation to TMT and requested feedback via email. TMT visited the issue during a 4/1 call and, with no objections, the following operation was put in to effect (see 4/1 Minutes for more details on the discussion):

Inflows \geq 120 kcfs: Operate for flood control consistent with the Water Control Manual
80 \leq Inflows < 120 kcfs: Operate Lower Granite pool at 734.0-735.0 ft (MOP+1)
50 \leq Inflows < 80 kcfs: Operate Lower Granite pool at 734.5-735.5 ft (MOP+1.5)
Inflows < 50 kcfs: Operate Lower Granite pool at 735.0-736.0 ft (MOP+2)

Dworshak Operations Update

Steve Barton, COE, summarized that Dworshak was currently at elevation 1462.3' and drafting, with 7.5 kcfs inflows and 14.4 kcfs outflows. The project was near 110% TDG. Near term forecasts were used to set the current mid-April flood control target of 1451' and the COE's plan to increase outflows to 18 kcfs later today to achieve 1451' by 4/30. Gunnar Leffler, Walla Walla District COE, added that the COE expects the Flood Control Rule Curve to intersect with the current target in April, and that this will become the new target at that time.

Russ Kiefer, Idaho, noted a concern for exceeding state TDG levels given the potential impacts on entrained kokanee, and asked if the COE might be able to maintain the current outflows, 14.4 kcfs, through the month rather than increase now and have to reduce flows later in the month. This, he suggested, would support reservoir fish populations and migrating listed fish passing the Lower Snake. The COE responded that they are required to meet the rule curve and, sharing Idaho's concern, intend to stay below 115% TDG. Increasing forecasts have posed a challenge to providing smooth operations this year, and, the COE was acknowledged for and said they would continue to do their best to meet multiple needs of the system.

Spill Priority List

Scott English, COE, shared that the posted spill priority list included salmon manager suggested changes and was currently in effect. He noted that the Mid-C projects stayed on as a placeholder for now, and that he was continuing to work with the PUDs to populate that section with useful information.

The salmon managers asked for clarification about the approach used with the list. Steve Barton, COE, said that the approach is to bring the entire system in to the same TDG condition; so starting at the top of the list and moving through all projects to reach 110% TDG; then moving on to 115% TDG (starting with the top project and moving down the list), and so on until the demands of the system are met. During fish passage season, the approach is the same, but for the fact that some projects are already spilling to some degree. The salmon managers asked whether it would be possible to spill to BiOp levels used during the spill passage season prior to the official start of the spill program (4/3 on the Snake and 4/10 on the Columbia), if necessary. The intent would be to spill where the fish were present. Steve Barton responded that this could be considered, however, other considerations such as intent and purpose of the spill priority list (a means of managing involuntary spill while trying to meet state water quality standards) would be important factors in any decision around how to manage involuntary spill.

Action/Next Steps: The salmon managers and COE will continue to check in on the spill priority list, making changes as needed throughout the season. For now, the current list, linked to this agenda item, will be used to guide spill in the system.

Update: The spill priority list was revisited during a 4/1 TMT conference call to discuss an SOR presented by the salmon managers on this topic. See the 4/1 notes for details.

MOP Operations

Steve Barton, COE, said that MOP operations were scheduled to be implemented on 4/3 and were subject to the COE's disposition on SOR 2011-01. Paul Wagner, NOAA, requested on behalf of the salmon managers a staggered start to MOP operations starting with Lower Granite, then Little Goose, then Lower Monumental, etc. as had been requested in previous years.

FOP Process Feedback

Steve Barton, COE, said the typos to the FOP reported by Oregon last week at TMT were acknowledged by legal and policy level representatives, who felt the errors would not impact operations moving forward.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Hungry Horse was at elevation 3500.17' with 8.4 kcfs outflows. Grand Coulee was at elevation 1251.75'; the flood control target for 4/30 would be determined by the early bird and official forecasts out on 3/31 and 4/11. Steve Barton, COE, reported on projects: Libby was at elevation 2364.8', with 9 kcfs outflows and 3.5 kcfs inflows. Albeni Falls was passing inflows and at elevation 2055.5'. Dworshak was at elevation 1462.3', with 14.4 kcfs outflows and 7.5 kcfs inflows, expecting to ramp up outflows to 18 kcfs later today. Day average flows at Lower Granite were 77.9 kcfs; 131.1 kcfs at Priest Rapids; 224.7 kcfs at McNary; and 225.6 kcfs at Bonneville.

Fish – Paul Wagner, NOAA, reported on juveniles. Yearling Chinook counts were 3,100 at Lower Granite (mostly hatchery fish). Subyearling Chinook counts were 1,000/day at Bonneville. Steelhead counts were around 8,000 at Lower Granite –. Sockeye counts at Lower Granite were 2,520 it was noted that these were most likely kokanee. Lamprey counts at Bonneville were about 200, and around 50 at Lower Granite.

Dave Wills reminded TMT that the Fish Passage Center produces a weekly report on hatchery releases, showing actuals and forecasted. He also reported that the Dworshak hatchery fish release was nearly complete, and that repairs on a water pipe at the hatchery would begin on Monday. Finally, he noted that coordination around the Spring Creek hatchery release and Bonneville turbine operations was underway, and that he would submit and present the plan for finalization at the 4/6 TMT meeting. Operations will begin on 4/12.

Power system – Tony Norris, BPA, reiterated that lack of market spill was underway, and that BPA was using the spill priority list to guide its actions. Grand Coulee will be drafted through April.

Water quality – Laura Hamilton, COE, reported that all fixed monitoring stations were on line in time for start of the spring spill season.

Next Meeting, April 6, 9:00 am

Agenda items include:

- Vernita Bar Operations
- Water Supply Forecasts
- Dworshak Operations Update
- Grand Coulee Operations
- Spring Creek Hatchery Release
- Chum Emergence
- Operations Review
- MOP Operations
- Snake River Spill

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

March 30, 2011
Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, COE, NOAA, CRITFC/Umatilla, USFWS, BOR, Oregon, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Current Operations

Tony Norris, BPA, notified TMT that, due to lack of market spill combined with flood control drafting requirements at Grand Coulee, BPA would most likely be spilling within the hour. Project operators will follow the current spill priority list on the agenda for discussion later today.

3. SOR 2011-01, Lower Granite Pool Held at MOP+2 Feet through August

Glenn Vanselow, Pacific Northwest Waterways Association, presented SOR 2011-01. Brian Fletcher, Tidewater Barge Lines, and Craig Nelson, Tidewater Barge Lines, addressed technical issues regarding the operation of tugs. Representatives of the ports of Clarkston and Lewiston were also on the line. SOR 2011-01 requests that Minimum Operating Pool (MOP) at Lower Granite pool be modified to provide safe conditions for navigation. This change would take the Lower Granite pool from its typical MOP elevation range of 733-734 feet to the 735-736 foot range.

The reason for requesting the added depth is navigation problems in the confluence of the Clearwater and Snake Rivers, caused by the presence of sediment in the main river channel which was last dredged in December 2005 and early 2006. Dredging has not occurred since then due to outstanding legal issues associated with an ongoing lawsuit associated with dredging in the Snake River. Part of the Settlement Agreement stipulated the need to have a finalized Sediment Management Plan completed prior to dredging the Snake River as specified in the Settlement Agreement. The Sediment Management plan was due in 2009 but due to lack of funding the Sediment Management Plan has not been completed. The record of decision for the Programmatic Sediment Management Plan is scheduled to be signed in December of 2012.

In previous years TMT agreed to a MOP+1 operation, Vanselow recalled, and on November 10, 2010, navigators presented a request to operate at MOP+2 although the meeting notes say MOP+1. This variation is in accordance

with RPA 5 of the BiOp, which calls for MOP operations but allows for adjustments for authorized purposes, primarily navigation. Encroachment of sediment in the federal navigation channel has reduced navigation depths at port facilities and in Clarkston, which creates a safety hazard for cargo barges and cruise boats. When Lower Granite forebay elevation was at 734.59 feet on March 28, boat propellers were turning up severe sediment during maneuvering. This type of problem exists from the port of Lewiston down through the confluence of the Clearwater. Paul Wagner, NOAA, asked whether the main navigation channel or port access is the problem. The biggest hazard is in the main navigation channel, Fletcher replied.

Barton asked whether these conditions are normally seen when flows are low, or is there a flow threshold that provides natural relief? A Port of Lewiston representative said the sediment created navigation problems for the port all last summer, but couldn't tie it to specific flow volumes. Low elevations combined with higher river flows worsen the situation and can have serious consequences. Barton asked about the nature of the safety concerns. Lack of keel clearance for barges limits maneuverability and makes them harder to control, Vanselow explained. There's wear and tear on the equipment.. Last year the situation skirted the edges of safety. There are also economic impacts when barge passage is limited by sediment, Fletcher added.

Wagner asked whether lighter loading of barges could help solve the problem. To what extent does frequent use help solve it? The sediment never really goes away, Fletcher replied, although regular movement helps keep it in check. Tidewater barges travel the channel continuously at least twice a week year-round, Nelson said. Barton asked whether the frequency of use is different this year than in other years. Usually it slows down in June and picks up again in late July, Vanselow replied. This year is unusual in that a lot of cargo has been moved early because of a planned lock outage. Wanda Keefer, Port of Clarkston, said an estimated 2-3 barges of logs go out of the port per week, plus cruise boat traffic every other week.

Ron Boyce, **Oregon**, said he needs more time to sort this issue out before responding. The MOP+2 proposal needs to be formally vetted through the regional process. We need to clearly understand the impacts of such an operation on fish and know what the alternatives are, including ways to mitigate impacts on fish.

Russ Kiefer, **Idaho**, said it's important to figure out how to accommodate both the needs of fish and river commerce in Idaho. Wagner reported that **FPAC** discussed this issue yesterday and noted there are allowable deviations from the BiOp-ordered MOP operation at Lower Granite. He asked why dredging hasn't happened. The court Settlement Agreement allows for dredging, Vanselow said, but the ports and the COE have been waiting for the Sediment Management Plan. The question at hand is, are there alternatives to dredging that will keep

sediment out of the river? The Settlement Agreement allows for dredging, however the ports and the COE have been waiting for the outcome of the Sediment Management Plan because there could be a potential challenge from former plaintiffs in the Settlement Agreement.

Tom Lorz, **CRITFC/Umatilla**, asked what the COE's long term plans are to address the sedimentation issue. We've been working on the long term Sediment Management Plan, which was scheduled for completion in 2009, but funding cuts have made it difficult to proceed, Steve Hall, COE Walla Walla, reported. Lorz wondered whether the criteria for allowing emergency dredging could expedite the dredging before 2013. There is an emergency dredging stipulation in the Settlement Agreement, Ann Glassley, COE, replied.

In response to the SOR, Barton said, the **COE** will look into its emergency authority to dredge as one potential solution, and will take a comprehensive look at solutions. Barton will communicate TMT's feedback within the COE, as well as to RIOG members and federal executives. The timing of water management decisions is critical at this point, given that MOP operations start on April 3 which is fast approaching. Barton will communicate the COE's decision regarding the SOR to TMT and to Vanselow for distribution to other navigators.

4. Dworshak Operations Update

Dworshak is at 1,562.3 feet, continuing to draft toward elevation 1,451.4 feet by mid-April, Barton reported. Inflows have been in the range of 7.5 kcfs and discharges are 14.4 kcfs. The near-term forecast shows we're on track to reach the mid-April target, but the model is suggesting that the COE increase discharges by around 2 kcfs, as noted last week.

Gunnar Leffler, COE Walla Walla, reported that outflows will increase to 18 kcfs at midnight tonight. This is due to a projection that the system flood control requirements at Dworshak will intersect with the flood control refill curve before April 30 – especially with the surge of water that's expected starting April 1. Tony Norris, BPA, said Snake River elevations have been high for a while, and BPA has had a request to increase discharges from Dworshak.

Lorz reminded everyone that flow volume influences whether the Little Goose spillway weir should be in the high-crest or the low-crest position. Kiefer said he was notified the COE plans to operate Little Goose in the low-crest mode based on the latest STP forecast.

Kiefer expressed concern that increasing outflows to 18 kcfs will exceed the state water quality standard, entrain more kokanee at Dworshak, and reduce the likelihood of meeting flow objectives later in spill season. He wondered whether it would be possible to maintain the current 14.4 kcfs operation through April because it would be better for the reservoir, water quality, and fish passage

in the lower Snake below Dworshak. Leffler explained that 14.4 kcfs kept TDG levels right at 110% for hatchery releases, but the COE is ultimately required to operate to the system flood control refill curve. The goal for project operators is to release 18 kcfs but keep TDG levels under 115%. Because the water supply forecast is increasing system wide, with adverse weather moving through the basin, flood control at this point is a challenge, Barton said.

Karl Kanbergs, COE, pointed out that while the latest STP traces show Dworshak inflows going up to around 20 kcfs around April 1, it looks like the forecast has increased since then. It's not inconceivable that Dworshak will go into local flood control operation if inflows rise as high as forecasted on the north fork of the Clearwater. Kanbergs said the COE will consider Idaho's request for a smooth operation as projects are positioned to provide flows when needed to meet flow objectives. TMT will follow up on this issue at its next meeting April 6.

5. Spill Priority List

Scott English, COE, reported that the COE made a few changes to the spill priority list since it was presented to TMT last week. Changes to the current list, linked to this item on today's agenda, include the Little Goose day and night priorities, the order of projects as discussed previously at TMT, and placement of the lower Columbia projects in response to feedback from FPAC. English reminded everyone that the mid-Columbia projects are listed for information only and the COE has no authority to spill there. Barton said this list was distributed yesterday and will be implemented without further notice unless TMT recommends a change.

The order differs slightly this year from past years due to FPAC input. Yesterday's FPAC discussion got confusing with regard to implementing the list when projects are spilling in the 110-115% range, Wagner said. FPAC preferred to exhaust spill amounts going down the list, rather than stay in the 110% TDG range at each project. To address the confusion, Barton walked everyone through the process of how the list will be activated to minimize impacts of involuntary spill due to lack of load. Beginning with the 110% column, the projects would spill in order, continuing down the list until either the problem is alleviated or the list ends. If that's not enough spill, the COE will work its way down the 115% TDG column and subsequently higher levels. Barton said the Grand Coulee (a) and (b) distinction involves forebay elevations and whether the drum gate or regulating outlet is used. The distinction between day and night spill at Little Goose was added in response to FPAC recommendations.

Norris said there haven't been any problems with lack of market spill for congestion affecting the order of the list. That's usually the result of summer minimum generation rather than a lack of market spill in spring. Kiefer asked, would Dworshak spill 37% before the COE moves to the 115% line to look for relief? Barton said yes.

The distinction between bulk and flat spill at Lower Monumental is the result of FPAC research indicating that a bulk spill pattern is better for survival, Kiefer said. Bulk spill is therefore FPAC's preferred pattern at Lower Monumental, but switching to flat spill could provide some relief in high TDG situations. He recommended adding this distinction to the spill priority list. The COE recognizes that as an FPAC recommendation, Barton said. Although it's not reflected on the current list, it's still under discussion.

Wagner asked, instead of spilling 20 kcfs at Little Goose and Lower Granite, why not go straight to BiOp spill levels before spill season starts? That would provide benefits to juveniles first, rather than going through the 110%, 115% and 120% TDG levels at all projects on the list before finally hitting BiOp spill at 120% for key projects. This is why there has been consternation regarding the relative order of projects. One issue is a lack of state waivers to cover all these conditions, Barton replied. The waivers take effect on April 3 in Oregon and on April 10 in Washington. While the waivers cover spill operations for fish passage, the spill priority list is tied to over generation, not fish passage. The BiOp spill suggestion could be discussed but it goes counter to what's been in the spill priority list, Barton said. The COE will consider the purpose of the suggestion and how it fits into other operations. Other TMT members gave their views of the FPAC proposal to implement the spill list at varying TDG levels:

- **CRITFC/Umatilla** – it makes sense to put any extra spill where fish are instead of at Dworshak. This is potentially a wiser operation.
- **Oregon** – No comments.
- **Idaho** – It seems logical to put spill near the start of migration on projects where more listed fish are migrating.
- **Washington** – Concur with Idaho.
- **USFWS** – No comments.
- **BPA** – Would have a problem with this change unless the states issue waivers with new dates. Currently there's no coverage for spill over 110% TDG outside of fish passage season. It might be possible to implement this idea by altering the % TDG column designations without having to invoke the state waiver process.
- **BOR** – No comments.

There's a time of travel equilibrium associated with TDG values in the spill priority list, Scott English added. TMT will revisit this issue.

6. MOP Operations

Subject to disposition of SOR-2011-01 at Lower Granite, all federal projects will be at MOP as required on April 3, Barton reported. The Salmon Managers would like to request the same relative order as in prior years, (Lower Granite, Little Goose, Lower Monumental, and Ice Harbor), Wagner said. The Action Agencies were not in a position to respond to this request today.

7. FOP Process Feedback

Steve Barton, COE, gave an update since the last TMT meeting, when Rick Kruger, Oregon, pointed out errors in a header and a portion of text regarding Lower Granite that should have been deleted. The FOP has been incorporated into the court order with the errors noted by Oregon, and the COE will operate to that order. The errors won't affect overall operations.

8. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3,500.17 feet, discharging 8.4 kcfs. Grand Coulee is at elevation 1,251.75 for drum gate maintenance, operating to spring flood control targets. As mentioned earlier, an increase in water supply to The Dalles is expected in mid April. The BOR will use the early bird RFC forecast to estimate the April 30 elevation and plan April operations accordingly. The official forecast for April is due around April 11.

Libby is at elevation 2,364.8 feet, discharging 9 kcfs with inflows around 3.5 kcfs, operating to the end of March flood control target. Wagner asked whether a larger inflow forecast would cause additional drafting at the end of April. The forecast is around 6.9-7.1 kcfs and fairly stable, Kanbergs said.

Dworshak is at elevation 1,462.3 feet, discharging 14.4 kcfs as discussed earlier, with inflows of 7.5 kcfs. Discharges are expected to increase to 18 kcfs in response to an approaching storm.

Lower Granite is discharging 77.9 kcfs, Priest Rapids is discharging 131.1 kcfs, McNary is discharging 224.7 kcfs, and Bonneville is discharging 225.6 kcfs. Yesterday's STP was in excess of 150 kcfs on the lower Columbia.

b. Fish. Juveniles: Paul Wagner, NOAA, reported that yearling Chinook are passing the January trap at the rate of a couple hundred per day, 20 per day at Grande Ronde, and 3,100 per day at Lower Granite. This is a mixture of hatchery and wild fish. Less than 1,000 fish per day are passing Bonneville. These are hatchery releases from tributaries above the Bonneville pool. Subyearlings (mostly fry) are passing Bonneville at the rate of 1,000 per day. Steelhead passage bumped at 8,000 per day at Lower Granite. A Dworshak

hatchery release could have been a big contributor to that total. Russ Kiefer confirmed that a lot of those 8,000 steelhead were from hatchery releases.

Adults: Wagner didn't have much to report. Next week might bring more adult movement.

c. Power System. As mentioned earlier, BPA is probably spilling now due to lack of market load, Norris said. Grand Coulee will be drafting heavily in April in response to robust flows on the mid Columbia.

d. Water Quality. Laura Hamilton, COE, reported that as of yesterday all fixed monitoring stations were installed and ready for spill season.

9. Other

Dave Wills, USFWS, made three announcements:

The Fish Passage Center publishes a weekly report through the Friday of each week. Last Friday's report documents hatchery releases for the previous weeks, as well as those planned for coming weeks. This is a useful tool for figuring out how many fish are coming down the river.

The Dworshak hatchery release is nearly complete, and the Chinook release was completed last week. Tomorrow the steelhead release will be completed early this year so repairs to the hatchery pipe can proceed.

As documented in the Water Management Plan, TMT needs to coordinate Bonneville turbine operations for the Spring Creek release on April 12. Wills is reviewing last year's teletype for this operation and will submit it for TMT discussion next week.

10. Next Meetings

The next regular TMT meeting will be on April 6, with the Spring Creek Hatchery release, , Dworshak operations, MOP operations, spill operations, and the disposition of SOR 2011-01 on the agenda. TMT will meet weekly thereafter.

Name	Affiliation
Steve Barton	COE
Tony Norris	BPA
Doug Baus	COE
Brian Fletcher	Tidewater Barge Lines
Glenn Vanselow	Pacific Northwest Waterways Association
Craig Nelson	Tidewater Barge Lines
Paul Wagner	NOAA
Tom Lorz	CRITFC/Umatilla

David Wills	USFWS
John Roache	BOR
Karl Kanbergs	COE
Steve Hall	COE
Ann Glassley	COE
Cathy Rogers	COE
Eric Braun	COE
Scott English	COE
Wanda Keefer	Port of Clarkston
Amy Benner	Port of Lewiston
Alex Ibarra	Grant PUD
Greg Hoffman	COE
Charles Morrill	Washington
Margaret Filardo	FPC
Barry Espenson	CBB
Dave Benner	FPC
Russ George	WMC
Bruce McKay	Consultant
Ruth Burris	PGE
Mike Shapley	Snohomish PUD
Rob Allermann	Deutsch Bank
Tara Kelly	JP Morgan
XX	Benson Energy
Shane Scott	PPC
Tom Le	Puget Sound Energy
Glen Trager	Iberdrola
Doug Matoon	Valley Vision
Richelle Beck	DRA
Tim Heizenrader	Centaurus
Ron Boyce	Oregon
Gunnar Leffler	Walla Walla
Russ Kiefer	Idaho