



Glen Canyon

Adaptive Management Work Group WebEx/Conferece Call Meeting

Wednesday, May 25, 2016

8:00 AZ / 9:00 MDT / 11:00 EDT

WebEx URL: <https://ucbor-events.webex.com/ucbor-events/onstage/g.php?MTID=e41d62843c7f459f40c6daf75840d7a01>

**Conference Call: 877-913-4721
Passcode: 3330168**

**Glen Canyon Dam Adaptive Management Work Group Meeting
May 25, 2016**

Meeting Packet Order

| Documents |
|---|
| <ul style="list-style-type: none">• Meeting Information Page• Meeting Packet Order• Federal Register Notice• WebEx Participant Information• Agenda for May 25, 2016, Meeting• Approval of Minutes from February 24-25, 2016, Meeting• Action Item Tracking Report |
| AIF: Science Advisors: Charter, Protocols, and FY17 External Review Topics |
| AIF: FY 2017 Budget and Work Plan |
| AIF: Basin Hydrology and WY 2017 Hydrograph |
| AIF: Federal Advisory Committee Act Overview: FACA 101 – Managing People and Process |
| AIF: Law of the River Overview |
| AMWG Next Steps |

| State | Department | Contact information |
|--------------------|--|---|
| Alaska | Division of Oil and Gas | Monica French, 550 West 7th Avenue, Suite 800, Anchorage, AK 99501–5313. |
| California | State Controller's Office | Elizabeth Gonzalez, 300 Capitol Mall, Suite 518, Sacramento, CO 94250–5874. |
| Colorado | Colorado Department of Revenue, Mineral Audit Section. | Brenda Petersen, 720 S. Colorado Blvd., Suite 400N, Denver, CO 80246–1968. |
| North Dakota | State Auditor's Office, Royalty Audit Section. | Dennis Roller, 425 North 5th Street, 3rd Floor, Bismarck, ND 58501–4033. |
| Texas | Texas General Land Office | Luke Decker, 1700 N. Congress Ave., Suite 640, Austin, TX 78701–1436. |
| Utah | Utah State Tax Commission | Jennifer Casady, 210 North 1950 West, Salt Lake City, Utah 64134–9000. |
| Wyoming | WY Dept. of Audit, Mineral Audit Division. | Steve Dilsaver, 122 West 25th Street, Cheyenne, WY 82001–3004. |

The States' new agreement application, including proposed budget and work plan, are due April 1, 2016. In accordance with 30 CFR 1227.101(b)(1), the States request that ONRR delegate the royalty management functions of conducting audits and investigations. The States request delegation of these functions for producing Federal oil and gas leases within the State boundaries, as applicable. This is for producing Federal oil and gas leases in the Outer Continental Shelf, subject to revenue sharing under 8(g) of the Outer Continental Shelf Lands Act, 43 U.S.C. 1337(g); and for other producing solid mineral or geothermal Federal leases

within the State. The States do not request delegation of royalty and production reporting functions. In addition to audit and investigation authority, the State of Wyoming also requests to renew its authority under 30 CFR 1227.101(b)(2) to issue Orders to Pay, Orders to Perform, and tolling agreements as a result of an audit or compliance review; it also requests to renew its subpoena authority under the Royalty Simplification and Fairness Act related to oil and gas revenues owed to the United States and shared with the State, which are attributable to leased Federal onshore property within the State.

The States have asked ONRR to renew the delegations within the time required by 30 CFR 1227.110(b). The States of Alaska, California, and Utah request 100-percent funding of the delegated functions for a 3-year period beginning July 1, 2016, with the opportunity to extend for an additional 3-year period. The States of Colorado, North Dakota, Texas, and Wyoming request 100-percent funding of the delegated functions for a 3-year period beginning October 1, 2016, with the opportunity to extend for an additional 3-year period. The States have a current audit delegation agreement with ONRR, as shown in the table below:

| State | Agreement No. | Term |
|--------------------|---------------|---|
| Alaska | D12AC70003 | 7/01/2010–6/30/2013, 7/01/2013–6/30/2016. |
| California | D12AC70004 | 7/01/2010–6/30/2013, 7/01/2013–6/30/2016. |
| Colorado | D12AC70005 | 10/01/2010–9/30/2013, 10/01/2013–9/30/2016. |
| North Dakota | D12AC70007 | 10/01/2010–9/30/2013, 10/01/2013–9/30/2016. |
| Texas | D12AC70009 | 10/01/2010–9/30/2013, 10/01/2013–9/30/2016. |
| Utah | D12AC70010 | 7/01/2010–6/30/2013, 7/01/2013–6/30/2016. |
| Wyoming | D12AC70012 | 10/01/2010–9/30/2013, 10/01/2013–9/30/2016. |

Therefore, ONRR has determined that we will not hold a formal hearing for comments under 30 CFR 1227.105.

Dated: April 6, 2016.

Gregory J. Gould,

Director, Office of Natural Resources Revenue.

[FR Doc. 2016–09217 Filed 4–20–16; 8:45 am]

BILLING CODE 4335–30–P

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR04073000, XXXR4081X3, RX.05940913.7000000]

Glen Canyon Dam Adaptive Management Work Group Notice of Public Meeting

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice.

SUMMARY: The Glen Canyon Dam Adaptive Management Work Group (AMWG) makes recommendations to the Secretary of the Interior concerning Glen Canyon Dam operations and other management actions to protect resources downstream of Glen Canyon Dam consistent with the Grand Canyon Protection Act. The AMWG meets two to three times a year.

DATES: The May 25, 2016, AMWG WebEx/conference call will begin at 11:00 a.m. (EDT), 9:00 a.m. (MDT), and 8:00 a.m. (PDT) and conclude three (3) hours in the respective time zones. See call-in information in the **SUPPLEMENTARY INFORMATION** section.

FOR FURTHER INFORMATION CONTACT: Ms. Katrina Grantz, Bureau of Reclamation, telephone (801) 524–3635; facsimile (801) 524–3807; email at *kgrantz@usbr.gov*.

SUPPLEMENTARY INFORMATION: The Glen Canyon Dam Adaptive Management Program (AMP) was implemented as a result of the Record of Decision on the Operation of Glen Canyon Dam Final Environmental Impact Statement to comply with consultation requirements of the Grand Canyon Protection Act (Pub. L. 102–575) of 1992. The AMP includes a Federal advisory committee, the AMWG, a technical work group, a Grand Canyon Monitoring and Research Center, and independent review panels. The technical work group is a subcommittee of the AMWG and provides technical advice and recommendations to the AMWG.

Agenda: The primary purpose of the meeting will be for the AMWG to discuss the Glen Canyon Dam Adaptive Management Budget and Workplan for Fiscal Year 2017 and the 2017 hydrograph. There will also be updates on: (1) The Long-Term Experimental

and Management Plan Environmental Impact Statement, and (2) current basin hydrology. The AMWG will discuss other administrative and resource issues pertaining to the GCDAMP. To participate in the WebEx/conference call, please use the following instructions:

1. Go to: This will need to be changed if the date/time changes <https://ucbor-events.webex.com/ucbor-events/onstage/g.php?MTID=e41d62843c7f459f40c6daf75840d7a01>.

2. If requested, enter your name and email address.

3. If a password is required, enter the meeting password: AMWG.

4. Click "Join Now".

Audio Conference Information:

- Phone Number: (877) 913-4721
- Passcode: 3330168
- Event Number: 994 578 626

There will be limited ports available, so if you wish to participate, please contact Linda Whetton at (801) 524-3880 to register.

To view a copy of the agenda and documents related to the above meeting, please visit Reclamation's Web site at: <http://www.usbr.gov/uc/rm/amp/amwg/mtgs/16may25/index.html>. Time will be allowed for any individual or organization wishing to make formal oral comments on the call. To allow for full consideration of information by the AMWG members, written notice must be provided to Katrina Grantz, Bureau of Reclamation, Upper Colorado Regional Office, 125 South State Street, Room 8100, Salt Lake City, Utah, 84138; telephone (801) 524-3635; facsimile (801) 524-3807; email at kgrantz@usbr.gov, at least five (5) days prior to the call. Any written comments received will be provided to the AMWG members.

Public Disclosure of Comments

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

Dated: March 24, 2016.

Katrina Grantz,

Chief, Adaptive Management Group,
Manager, Environmental Resources Division,
Upper Colorado Regional Office.

[FR Doc. 2016-09234 Filed 4-20-16; 8:45 am]

BILLING CODE 4332-90-P

INTERNATIONAL TRADE COMMISSION

Notice of Receipt of Complaint; Solicitation of Comments Relating to the Public Interest

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has received a complaint entitled *Certain Quartz Slabs and Portions Thereof DN 3139*; the Commission is soliciting comments on any public interest issues raised by the complaint or complainant's filing under section 210.8(b) of the Commission's Rules of Practice and Procedure (19 CFR 210.8(b)).

FOR FURTHER INFORMATION CONTACT: Lisa R. Barton, Secretary to the Commission, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436, telephone (202) 205-2000. The public version of the complaint can be accessed on the Commission's Electronic Document Information System (EDIS) at EDIS,¹ and will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436, telephone (202) 205-2000.

General information concerning the Commission may also be obtained by accessing its Internet server at United States International Trade Commission (USITC) at USITC.² The public record for this investigation may be viewed on the Commission's Electronic Document Information System (EDIS) at EDIS.³ Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission has received a complaint and a submission pursuant to section 210.8(b) of the Commission's Rules of Practice and Procedure filed on behalf of Cambria Company LLC on April 14, 2016. The complaint alleges violations of section 337 of the Tariff Act of 1930 (19 U.S.C. 1337) in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain quartz slabs and portions

thereof. The complaint names as respondents Wilsonart LLC of Temple, TX; and Dorado Soapstone LLC of Denver, CO. The complainant requests that the Commission issue a general exclusion order, a limited exclusion order, cease and desist orders and impose a bond upon respondents' alleged infringing articles during the 60-day Presidential review period pursuant to 19 U.S.C. 1337(j).

Proposed respondents, other interested parties, and members of the public are invited to file comments, not to exceed five (5) pages in length, inclusive of attachments, on any public interest issues raised by the complaint or section 210.8(b) filing. Comments should address whether issuance of the relief specifically requested by the complainant in this investigation would affect the public health and welfare in the United States, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, or United States consumers.

In particular, the Commission is interested in comments that:

- (i) Explain how the articles potentially subject to the requested remedial orders are used in the United States;
- (ii) identify any public health, safety, or welfare concerns in the United States relating to the requested remedial orders;
- (iii) identify like or directly competitive articles that complainant, its licensees, or third parties make in the United States which could replace the subject articles if they were to be excluded;
- (iv) indicate whether complainant, complainant's licensees, and/or third party suppliers have the capacity to replace the volume of articles potentially subject to the requested exclusion order and/or a cease and desist order within a commercially reasonable time; and
- (v) explain how the requested remedial orders would impact United States consumers.

Written submissions must be filed no later than by close of business, eight calendar days after the date of publication of this notice in the **Federal Register**. There will be further opportunities for comment on the public interest after the issuance of any final initial determination in this investigation.

Persons filing written submissions must file the original document electronically on or before the deadlines stated above and submit 8 true paper copies to the Office of the Secretary by

¹ Electronic Document Information System (EDIS): <http://edis.usitc.gov>.

² United States International Trade Commission (USITC): <http://edis.usitc.gov>.

³ Electronic Document Information System (EDIS): <http://edis.usitc.gov>.

AMWG WebEx/Conference Call, May 25, 2016

Get the details:

Meeting: AMWG WebEx
Date: May 25, 2016

Times: 8 a.m. – 11 a.m. (PDT)
9 a.m. – 12 p.m. (MDT)
11 a.m. – 2 p.m. (EDT)

WebEx Control: Katrina Grantz
Facilitator: Mary Orton
Note Taker: Linda Whetton
Timekeeper: Mary Orton
Technical Support: Stacey Smith (sosmith@usbr.gov) Cell: 801-671-1115
Linda Whetton (lwhetton@usbr.gov) Cell: 801-699-7292

Get prepared:

You can find the meeting documents at
<http://www.usbr.gov/uc/rm/amp/amwg/mtgs/16may25/index.html>.

Get connected:

WebEx URL: <https://ucbor-events.webex.com/ucbor-events/onstage/g.php?MTID=e41d62843c7f459f40c6daf75840d7a01>

Conference Call: 877-913-4721, Passcode: 3330168

Get some tips for a successful webinar:

1. Quit all unnecessary applications before logging into WebEx.
2. Log in to the web conference early. Have your agenda and materials printed out or otherwise available.
3. If you have trouble signing in, call Stacey Smith at 801-671-1115
4. Call into the conference call number.
5. Please mute the audio on your telephone.
6. Never use your “hold” button as this could play music for everyone on the webinar.
7. If you want to ask a question or make a comment, use the “raise hand” button to indicate you want to speak over the telephone.
8. Please identify yourself when you speak.

Get some more information:

Over the telephone, the Facilitator will call roll for AMWG representation a few minutes into the call, and then ask for others to identify themselves. If you arrive late, please let us know you have joined via the chat function.

Remember, the call will be recorded to help with creating the minutes.

**GLEN CANYON DAM ADAPTIVE MANAGEMENT PROGRAM
ADAPTIVE MANAGEMENT WORK GROUP MEETING, MAY 25, 2016**

WebEx URL: <https://ucbor-events.webex.com/ucbor-events/onstage/g.php?MTID=e41d62843c7f459f40c6daf75840d7a01>
Conference Call: 877-913-4721, Passcode: 3330168

DRAFT AGENDA

| START TIME ¹ (Duration) | Topic, Presenter, and Purpose |
|--|--|
| <p>8:00 AZ 9:00 MDT 11:00 EDT (:15)</p> | <p>Welcome and Administrative – Jennifer Gimbel, Secretary’s Designee</p> <ol style="list-style-type: none"> 1. Introductions and Determination of Quorum (13 members) 2. Webinar Protocols <ul style="list-style-type: none"> ▪ Please mute the audio on your telephone. ▪ Do not use your “hold” button, as this could play music for everyone on the webinar. ▪ If you want to ask a question or make a comment, use the “raise hand” button on the webinar platform to indicate you want to speak. ▪ Please identify yourself when you speak. ▪ AMWG members, please let us know if you need to leave before the webinar is over, particularly if your alternate is not on the line, for quorum purposes. 3. Review purpose of the meeting and desired outcomes 4. Approval of February 24-25, 2016, meeting minutes 5. Update on recruitments: GCMRC Deputy Chief 6. LTEMP update 7. Action Item Tracking Report 8. Progress on Nominations and Reappointments |
| <p>8:15 AZ 9:15 MDT 11:15 EDT (:35)</p> | <p>Science Advisors: Charter, Protocols, and FY17 External Review Topics – David Braun, Executive Coordinator, GCDAMP Science Advisors; and Vineetha Kartha, TWG Chair</p> <ul style="list-style-type: none"> ▪ Presentation (25 minutes) ▪ Q&A and discussion (10 minutes) |
| <p>8:50 AZ 9:50 MDT 11:50 EDT (:15)</p> | <p>FY 2017 Budget and Work Plan – Katrina Grantz, Bureau of Reclamation; Scott VanderKooi, Grand Canyon Monitoring and Research Center; and Shane Capron, TWG Vice-Chair and TWG Budget Ad Hoc Group Chair</p> <ul style="list-style-type: none"> ▪ Presentation (10 minutes) ▪ Q&A, discussion, and feedback (5 minutes) |
| <p>9:05 AZ 10:05 MDT 12:05 EDT (:25)</p> | <p>Basin Hydrology and WY 2017 Hydrograph – Paul Davidson and Katrina Grantz, Bureau of Reclamation</p> <ul style="list-style-type: none"> ▪ Presentation (15 minutes) ▪ Q&A, discussion, and feedback (10 minutes) |

| START TIME ¹ (Duration) | Topic, Presenter, and Purpose |
|--|--|
| 9:30 AZ 10:30 MDT 12:30 EDT (:05) | B R E A K |
| 9:35 AZ 10:35 MDT 12:35 EDT (:30) | Federal Advisory Committee Act Overview: FACA 101 – Managing People and Process – Jill Nagode, Bureau of Reclamation <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) |
| 10:05 AZ 11:05 MDT 1:05 EDT (:30) | Law of the River Overview – Rod Smith, Department of Interior <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) |
| 10:35 AZ 11:35 MDT 1:35 EDT (:05) | AMWG Next Steps – Jennifer Gimbel, Secretary’s Designee <ul style="list-style-type: none"> ▪ Next AMWG Meeting: August 24-25, 2016 in Flagstaff, Arizona <ul style="list-style-type: none"> ○ Major agenda topics: <ul style="list-style-type: none"> • Recommendation to the Secretary on FY2016 budget and workplan and WY2017 hydrograph • GCMRC science updates • Presentation from Scott Gutting, Energy Strategies, LLC • Stakeholder’s Perspective • Tribal Liaison Report ○ Please send your suggestions for additional agenda items to Linda Whetton (lwhetton@usbr.gov) by June 1, 2016. ▪ Upcoming AMWG meetings: <ul style="list-style-type: none"> ○ February 22-23, 2017 ○ May 24, 2017 (webinar) ○ August 30-31, 2017 |
| 10:40 AZ 11:40 MDT 1:40 EDT (:15) | Public Comment |
| 10:55 AZ 11:55 MDT 1:55 EDT | Adjourn – Jennifer Gimbel |

¹ Every effort will be made to adhere to the schedule and agenda, but on occasion, for unforeseen reasons, some modifications may occur.

**Glen Canyon Dam Adaptive Management Work Group Meeting
February 24-25, 2016**

Summary of Actions Taken

The AMWG reached consensus on the following actions during this meeting:

- AMWG approves the minutes of August 26-27, 2015, meeting.
- The AMWG accepts the December 9, 2015, Grand Canyon Monitoring and Research Center (GCMRC) Technical Memo (Memo) of the Lees Ferry Trout Fishery Management Recommendations (Recommendations) subject to the following:
 1. Any actions resulting from the Recommendations must be fully consistent with the “Law of the River” and Department of the Interior (DOI) policy considerations.
 2. Recommendations that fall under the purview of water and natural resource management agencies such as Bureau of Reclamation, National Park Service, United States Fish and Wildlife Service, Arizona Game and Fish Department, and AMWG Tribes will require additional evaluation among these management agencies within the AMP for further consideration.
 3. Recommendations that address dam operations are expected to be considered and evaluated in light of the ongoing Long-Term Experimental and Management Plan (LTEMP) Environmental Impact Statement (EIS).

In addition, the AMWG directs the TWG to consider the Recommendations with the caveats above and the Memo as work plans and budgets are developed or reviewed.

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**February 24, 2016**

**Start Time:** 9:30 a.m.

**Conducting:** Jennifer Gimbel, Principal Deputy Assistant Secretary for Water and Science

**Facilitator:** Mary Orton, The Mary Orton Company, LLC

**Committee Members/Alternates:**

Jan Balsom, National Park Service (GRCA)  
Charley Bullets, So. Paiute Consortium  
Tom Buschatzke, State of Arizona  
Chris Cantrell, Arizona Game and Fish Department  
Deborah Dixon, State of New Mexico  
Jayne Harkins, State of Nevada  
Dawn Hubbs, Hualapai Tribe  
Leslie James, CREDA  
Sam Jansen, Grand Canyon River Guides  
Lynn Jeka, Western Area Power Administration  
John Jordan, Int’l Federation of Fly Fishers & TU  
Leigh Kuwanwisiwma, Hopi Tribe

Chip Lewis, Bureau of Indian Affairs  
Ora Marek-Martinez, Navajo Nation  
John McCLOW, State of Colorado  
Eric Millis, State of Utah  
David Nimkin, National Parks Conservation Assoc.  
Don Ostler, State of Wyoming  
Daniel Picard, U.S. Bureau of Reclamation  
Ted Rampton, UAMPS  
Steve Spangle, U.S. Fish and Wildlife Service  
Larry Stevens, Grand Canyon Wildlands Council  
Tanya Trujillo, State of California  
Ora Marek-Martinez, Navajo Nation

**Committee Members Absent:**

Eric Bobelu, Pueblo of Zuni  
James deVos, Arizona Game and Fish Department

Steve Wolff, State of Wyoming  
VACANT, San Juan Southern Paiute Tribe

**USGS/Grand Canyon Monitoring and Research Center**

Helen Fairley, Program Manager  
Kyrie Fry, Communications & Outreach Coordinator

Paul Grams, Program Manager  
Scott VanderKooi, Chief, GCMRC

**Interested Persons, TWG Members, and Alternates:**

Adam Arellano, WAPA  
Melinda Arviso-Ciocco, Navajo Nation  
Tara Ashby, U.S. Bureau of Reclamation  
Mary Barger, Interested public

Rob Billerbeck, National Park Service  
David Braun, Sound Science LLC  
Kathleen Callister, U.S. Bureau of Reclamation  
Shane Capron, WAPA/TWG Vice Chair

Bill Chada, U.S. Bureau of Reclamation  
Kerry Christensen, Hualapai Tribe  
Marianne Crawford, U.S. Bureau of Reclamation  
Kevin Dahl, National Parks Conservation Assoc.  
Kurt Dongoske, Pueblo of Zuni  
Marlon Duke, U.S. Bureau of Reclamation  
Ed Gerak, CREDA  
Katrina Grantz, U.S. Bureau of Reclamation  
Jessica Gwinn, U.S. Fish & Wildlife Service  
John Hamill, Int'l Federation of Fly Fishers & TU  
Paul Harms, State of New Mexico (phone)  
Beverley Heffernan, U.S. Bureau of Reclamation  
Vineetha Kartha, State of Arizona & TWG Chair  
Ted Kowalski, State of Colorado  
Kirk LaGory, Argonne National Laboratory  
Doug Milligan, Salt River Project (phone)  
Joe Miller, Trout Unlimited National Leadership Council  
Jill Nagode, U.S. Bureau of Reclamation  
Jessica Neuwerth, State of California  
Jenika Raub, Salt River Project (phone)

Jennifer Rebenack, National Park Service  
Brent Rhees, U.S. Bureau of Reclamation  
Sarah Rinkevich, DOI Federal Tribal Liaison  
Kendra Russell, U.S. Bureau of Reclamation  
Brian Sadler, Western Area Power Administration  
Seth Shanahan, Southern Nevada Water Authority  
Billy Shott, National Park Service (GLCA)  
Angela Slaughter, Colorado River Commission  
Rodney Smith, DOI/Solicitor's Office  
Stacey Smith, U.S. Bureau of Reclamation  
Rosemary Sucec, NPS (GLCA)  
Justin Tade, DOI/Solicitor's Office  
Shana Tighi, U.S. Bureau of Reclamation  
Lee Traynham, U.S. Bureau of Reclamation  
Jason Tucker, U.S. Bureau of Reclamation  
Dave Uberuaga, National Park Service (GRCA)  
Rich Valdez, SWCA  
Chris Watt, U.S. Bureau of Reclamation  
Michael Yeatts, Hopi Tribe

**Recorder:** Linda Whetton, Reclamation

**Welcome and Administrative.** Ms. Gimbel, Secretary's Designee, welcomed the members and general public.

- Introductions were made and a quorum was determined to be present.
- Approval of August 26-27, 2015, Meeting Minutes. Motion proposed by Mr. Nimkin, seconded by Ms. Trujillo. Pending an edit from Ms. Kartha (via e-mail), the minutes were approved by consensus.
- Action Item Tracking Report (**Attachment 1**) – The Havasupai Tribe is not interested in becoming an AMWG stakeholder but will continue to receive program correspondence.
- Progress on Nominations and Reappointments (**Attachment 2**) and other changes:
  - Ms. Gimbel welcomed the newly-appointed AMWG members: Eric Bobelu (absent, Pueblo of Zuni), Deborah Dixon (State of New Mexico), Dawn Hubbs (Hualapai Tribe), and Ora Marek-Martinez (Navajo Nation).
  - Ms. Gimbel welcomed the newly-appointed AMWG alternates: Melinda Arviso-Ciocco and Timothy Begay, Navajo Nation; Jan Balsom, National Park Service; Carleton Bowekaty, Pueblo of Zuni—member of the Tribal Council; Kathleen Callister, Bureau of Reclamation, who will also replace Beverley Heffernan on April 1 as the new Manager of the Environmental Resources Division in Salt Lake City; Ben Reeder, Grand Canyon River Guides; and Warren Turret, State of Nevada.
  - Jayne Harkins has been reappointed the AMWG member from Nevada.
  - Ms. Katrina Grantz replaced Glen Knowles as Chief of the Adaptive Management Group and will assume Reclamation's co-lead role on the LTEMP EIS effective April 1, 2016.
- Long-Term Experimental Management Plan EIS Update – Ms. Gimbel complimented Ms. Heffernan and Mr. Billerbeck on their Herculean efforts spearheading the LTEMP EIS effort, and thanked everyone involved in addressing the many issues. The Obama administration and DOI Secretary Jewell want this document completed this year. Because of the thousands of comments they anticipate they will receive, it will take considerable time and resources to respond, finalize the EIS, and prepare a Record of Decision. While she is sympathetic to requests for an extension to the comment period, the LTEMP co-leads issued a memo on February 16, 2016 (**Attachment 3**), stating the original schedule would be followed, in part because the 90-day comment period is already twice as long as the standard regulatory timeframe. She advised attendees to work as diligently as possible to review and provide comments on the Draft EIS, and then contact DOI if they absolutely cannot work within the schedule. Congress approved an additional \$2 million in Reclamation's budget that will go toward completion of the EIS. A public meeting will be held tomorrow at 6 p.m. in this conference room and a public meeting webinar on March 1. Comments should be submitted through the Argonne website (<http://ltempeis.anl.gov/>).

**Hopi Tribe's Monitoring Program (Attachment 4)** – Mr. Leigh Kuwanwisiwma, Hopi Tribe. The Hopi Tribe, comprised of about 14,000 Hopis, has been at their location and directly connected to the Grand Canyon for thousands of years. Hopis consider the Grand Canyon to be a sacred and revered place and their final destination. He provided background information on their ceremonies, traditions, and migrations and noted there are currently 34 clans at Hopi. The Hopi Tribe has such reverence for the Canyon that they do not allow alcohol on their river trips. Hopi resources in the Grand Canyon include: (1) Cultural – traditional cultural properties, archaeological sites, human remains, petroglyphs, and pictographs; (2) Biological – plants, birds, mammals, insects, reptiles, fish, springs, and side streams; and (3) Physical – minerals, sand, beaches, water, and springs.

Mr. Yeatts said the Hopi monitoring program officially began in 2008 although surveys have been done annually since 2003. Those completed since 2006 are used in current analyses. There have been 262 surveys completed, representing 148 individual Hopis. Over all the surveys and across all resource categories, the surveys indicate a positive assessment of resource health for 68% of the resources. There is a strong desire by the Hopi Tribe to remain involved in the management of the Grand Canyon. Additional input on terrestrial resources is needed, as the AMP has not consistently collected information on the status of a number of resource categories that are culturally important to the Hopi Tribe. This includes archaeological sites, vegetation, avifauna, reptiles, insects, and mammals.

**Technical Work Group Report (Attachment 5a)** – Ms. Vineetha Kartha, TWG Chair.

- The GCMRC Annual Reporting meeting was held on January 26-27, 2016 followed by a TWG meeting on January 28. The TWG will use new information on HBC, native fishes, and sediment in development of the FY 2017 budget and work plan.
- At the AMWG August 2015 meeting, the AMWG asked GCMRC to provide a technical review of the Lees Ferry Trout Fishery Management Recommendations report (Recommendations), and the TWG to evaluate that technical review. At the October TWG meeting, it was noted that some of the recommendations addressed dam operations; TWG members pointed out that those were being addressed in the LTEMP EIS. Other recommendations addressed policy issues and management considerations that were outside the purview of GCMRC and perhaps even the AMWG and TWG. Based on the discussions, the TWG created the Trout Ad Hoc Group (TAHG) to evaluate the GCMRC review. GCMRC submitted a revised review of the Recommendations on Dec. 9, 2015. The TAHG evaluated that review and while they found it to be comprehensive, they felt additional research or clarifications could be helpful on some of the recommendations. The TWG should identify any outstanding research questions as future work plans are deliberated. Based on the TWG's acceptance of GCMRC's report, the following motion was proposed (amended from the motion that was sent in advance to the AMWG):

**Motion** by John Jordan, seconded by Deborah Dixon:

The AMWG accepts the December 9, 2015, Grand Canyon Monitoring and Research Center (GCMRC) Technical Memo (Memo) of the Lees Ferry Trout Fishery Management Recommendations (Recommendations) subject to the following:

1. Any actions resulting from the Recommendations must be fully consistent with the "Law of the River" and Department of the Interior (DOI) policy considerations.
2. Recommendations that fall under the purview of water and natural resource management agencies such as Bureau of Reclamation, National Park Service, United States Fish and Wildlife Service, Arizona Game and Fish Department, and AMWG Tribes will require additional evaluation with these management agencies for further consideration.
3. Recommendations that address dam operations are expected to be considered and evaluated in light of the ongoing Long-Term Experimental and Management Plan (LTEMP) Environmental Impact Statement (EIS).

The AMWG directs the TWG to consider the Lees Ferry Trout Management Recommendations and the GCMRC Technical Memo when it reviews the GCDAMP Triennial Work Plan and Budget for FY 2017

and makes a recommendation to AMWG in June, and to report the results of that review with any recommended changes to the FY 2017 budget and work plan at the August 2016 AMWG meeting.

Discussion included the following points:

- *It seems the motion is asking for the TWG to consider the motion that was already considered in the memo. Is it appropriate to have the memo and not revisit all the recommendations?*
- *What goes forward are the technical recommendations from GCMRC. The intent is to have broad-based discussions, including development of the budgets and work plans.*
- *Non-federal entities would not be included in these discussions and they should be.*
- *Is this needed? The TWG already considers input from all stakeholders.*
- *We failed to comprehensively look at the metrics for the fishery. What does this quality fishery look like? The guides have put together a well-rounded set of recommendations and sets a baseline for what that fishery should look like. There were a few that fell outside purview of GCMRC.*
- *There is value going forward into the TWG process. It does not bind or obligate but provides an open arena for one stakeholder's concerns.*
- *Paragraph #2 follows the recommendations, so how can we have TWG consider what is outside their own purview while GCMRC is calling for items that are in purview of this program?*
- *"Consider" does not seem prescriptive but only a suggestion. The debate is whether we are instructing or prescribing something.*
- *Concerned about the time it takes GCMRC to do things and then asking them to do more on the fly.*

After further discussion, the following amended motion was considered and **approved by consensus**:

**Motion: The AMWG accepts the December 9, 2015, Grand Canyon Monitoring and Research Center (GCMRC) Technical Memo (Memo) of the Lees Ferry Trout Fishery Management Recommendations (Recommendations) subject to the following:**

1. **Any actions resulting from the Recommendations must be fully consistent with the "Law of the River" and Department of the Interior (DOI) policy considerations.**
2. **Recommendations that fall under the purview of water and natural resource management agencies such as Bureau of Reclamation, National Park Service, United States Fish and Wildlife Service, Arizona Game and Fish Department, and AMWG Tribes will require additional evaluation among these management agencies within the AMP for further consideration.**
3. **Recommendations that address dam operations are expected to be considered and evaluated in light of the ongoing Long-Term Experimental and Management Plan (LTEMP) Environmental Impact Statement (EIS).**

**In addition, the AMWG directs the TWG to consider the Recommendations with the caveats above and the Memo as work plans and budgets are developed or reviewed.**

**Motion was proposed by John Jordan, seconded by Deborah Dixon.**

Spring HFE Discussion. Ms. Kartha said that in response to a request from a stakeholder who was concerned that the sediment accounting system in the HFE Protocol (HFEP) would ever allow a spring HFE, the TWG discussed the sediment accounting period and the process for planning a Spring HFE. Because the LTEMP ROD will replace the HFEP, some members of the TWG felt these concerns should be addressed in the LTEMP EIS process. She also invited the concerned stakeholders to make a presentation at this AMWG meeting.

Dr. Larry Stevens distributed copies of the paper, "The Adequacy of the High Flow Experiment Protocol for Testing Springtime HFEs Under the LTEMP" (**Attachment 5b**), which provided ten reasons why spring HFEs would be beneficial. The language in the HFEP limits the potential for testing HFEs during the March-April springtime period. HFE benefits to conservation of sediment mass balance, nearshore native fish habitats, the aquatic food base, and recreational sandbar camping areas are largely lost within six months of an HFE. Springtime HFEs happen when high flows naturally occurred and may provide substantially improved resource benefits during the springtime and summer months than do autumn

(November) high flows, in keeping with the intent of the GCPA. As such, the request to the Secretary and the LTEMP co-lead agencies is to modify the HFEP in the LTEMP to allow for testing of springtime HFES by: (1) including consideration of unused sediment supplies following autumn HFES, or (2) when an autumn HFE is not conducted and sufficient sand exists on the channel bed. Under such sediment conditions, the HFEP language should be modified to relax accounting period constraints and permit springtime HFES. They further recommended that springtime HFE testing and evaluation be conducted during any year when sediment conditions are favorable, because such conditions are rare.

Discussion included the following points:

- The LTEMP analysis has shown that the HFEP protocol would allow for Spring HFES every three to four years.
- GCMRC has a solid monitoring program and would be able to monitor after a Spring HFE.
- Until there have been three spring HFES, it would be hard to determine the trout response.
- If a trout response (increased numbers of trout) were seen, and the other triggers met, the current EA would require non-native fish control. The action would be trout removal downstream in the Lower Colorado River. In the Draft LTEMP EIS, there is the option for trout management flows in response to the trout population for mitigative measures.
- This is the only program in the basin that does not emphasize spring high flows. The idea of the natural flow regime is to try to mimic natural conditions.

**2016 Annual Reporting Meeting Update (Attachment 6a, PowerPoint presentation)** – Mr. Paul Grams, GCMRC. The Annual Reporting meeting was held January 26-27, 2016, with presentations by GCMRC staff, cooperators and collaborators, staff of sister federal agencies, and tribal representatives. Updates to the following projects were provided:

- **Project 2: Streamflow, Water Quality, and Sediment Transport.** The sediment budget is affected by disruption of sand supply and change in flow regime. In Marble Canyon between the Paria River confluence and the Little Colorado River, there is about 6% of the pre-dam sand supply to the river channel; and below the Little Colorado River, there is about 16% with inputs from the LCR and additional small tributaries.
  - Lower Marble Canyon 1-1-2011 through 1-6-2016
    - Zero Bias Value: 190,000 metric tons
    - Upper Uncertainty Bound: 770,000 metric tons
    - Lower Uncertainty Bound: -390,000 metric tons
  - Results:
    - Sand evacuation occurs during periods of sustained high releases (equalization flows) and sand accumulation occurs during periods of sustained low/normal releases.
    - Sand resources (amount) appear to be sustainable over the long-reach scale except in higher release years.
  - Sand Budgets: 2011 – Present
    - Upper Marble Canyon – Accumulation before and export during each HFE. This is consistent with objective to “use” Paria sand without causing depletion from bed.
    - Lower Marble Canyon – There is accumulation during each HFE.
  - Results:
    - Systemic response of reach-scale sand budgets during HFES appears to be emerging under the HFE Protocol.
    - Differences from that observed during the 2004 and 2008 HFES is likely because of differing longitudinal distribution of the antecedent sand supply (large supply all in upper Marble Canyon under HFE protocol, either smaller supply or further downstream in previous high flows).
- **Project 3: Bedload Sand Transport.** The purpose of this research is to develop a more robust estimate of bedload sand transport and thereby reduce uncertainty in estimates of total sand transport.
  - Sand moves both on the bed and in suspension in the water.
  - The relative proportions moving by each process depends on grain size and flow strength.
  - Measurements made in 1998 indicated that only about 5% of the total sand load moved as “bedload.” Measurements were made over small areas of the bed at a limited number of sites and one flow rate.
- Preliminary conclusions:
  - New estimate of bedload consistent with earlier estimates
  - But shows variation with discharge
- Future work: Additional measurements at higher and lower discharges and need for measurements at additional sites.

- Project 3: Sandbars and In-channel Sand Storage Monitoring. This project measures the erosion of sandbars between HFEs and changes in high-elevation campsites.
  - HFEs in 2012, 2013, and 2014 built sandbars
    - Bars eroded between HFEs.
    - Greater erosion in years of higher release volumes.
    - Bars are larger now than at start of HFE protocol and periods with no HFEs, but there is no evidence for “progressive” increases in sandbar size.
  - High-elevation Campsite area (above 25,000 cfs stage)
    - No net change in non-critical reaches.
    - Increase from 2012 to 2014 in critical reaches.
  - The first three years of the HFE protocol were a period of low annual release volumes and good tributary sand supply.
    - Bar deposition occurred without depleting sand from storage.
    - Sand accumulated in Marble Canyon, replenishing sand evacuated during the 2011 equalization.
  - Sandbars: 2008 – present
    - 50 individual sandbars with data 2008-present
      - 25 in Marble Canyon, 7 in Grand Canyon (RM 60-87) and 18 in Grand Canyon (below RM 87)
    - With 2008 as reference (8-month post-HFE):
      - Increase in Marble Canyon and Grand Canyon (below RM 87).
      - No change in Grand Canyon (RM 60-87).
- Projects 3 and 11: Linkages between controlled floods, eddy sandbar dynamics, and riparian vegetation. This project attempts to explain the spatial variability in eddy sandbar response to floods. Spatial variability in eddy sandbar response to floods had been a challenge for monitoring, and it was difficult to characterize “average” response. Although the variability has long been recognized, it has not been fully explained. Because the extent of riparian vegetation has varied in time and varies among sites, they are investigating the linkage between vegetation and changes in sandbar morphology.
  - Sites with less vegetation showed: (1) Changes in sediment storage occur in eddy, (2) More HFE deposition on sandbar, and (3) Greater surface flow velocities.
  - Sites with more vegetation showed: (2) Changes in sediment storage occur in the channel, (2) Less HFE deposition on sandbars, and (3) Lower surface flow velocities.
  - Long-term increase in vegetation in zones inundated by charges less than 45,000 cfs showed: (1) Elevated baseflows that increase water table, and (2) Reduced frequency and magnitude of flood flows.
  - No change or decrease in vegetation in zones inundated by discharges 45,000 cfs indicated (1) Decoupled from river hydrology, and (2) Changes associated with regional precipitation.
- Projects 3 and 11: Riparian Vegetation Monitoring with Remote Sensing. This incorporates the 2013 overflight images to analyze long-term riparian vegetation changes 1964 to 2013. It also used remote sensing to analyze tamarisk beetle impacts to tamarisk.

Percentage of green tamarisk in 2009 was defoliated in 2013:

| Reach                           | % Tamarisk Vegetation | Total Area (m <sup>2</sup> ) |
|---------------------------------|-----------------------|------------------------------|
| Glen Canyon (GCD to Lees Ferry) | Green<br>Defoliated   | 200,055<br>9,535             |
| Kanab (RM 134.6 to 155.7)       | Green<br>Defoliated   | 40,470<br>10,948             |
| National (RM 158.6-180.5)       | Green<br>Defoliated   | 217,275<br>28,927            |

Mr. VanderKooi, GCMRC, provided the following updates (**Attachment 6b**):

- Riparian Vegetation Monitoring & Workshop. The workshop was held in June 2015 and colleagues from the Rio Grande and Upper and Lower Colorado River were invited to participate with the goal of having a broader look at riparian vegetation. They looked at the successes and challenges in nonnative vegetation control and to seek recommendations for scientifically based vegetation control programs. Restoration can be viewed on a different scales - global scales, reach in river, down to river scales and then to whole watershed scales. The participants

also shared success stories and what kinds of approaches could be utilized moving into the future. Resilience was a big concern not only in terms of demands on rivers and waterways but also in the context of climate change and the fundamental processes that are driving changes in riparian vegetation. If there is low genetic variability, there will be low resilience in the system. If you have a resilient system and you're taking a passive approach, it doesn't cost that much and you just let things happen. But the more hands-on you have to be, the higher the costs. Sharing information the key to making sure that everyone is learning from one another, staying current on best practices and moving forward with the various restoration plans. A USGS Open File Report is currently being reviewed and will include extended abstracts of most of the presentations.

- Project 12. This pilot project attempts to integrate traditional ecological knowledge (TEK) and western science through evaluating and documenting changes in 16 culturally-valued riparian plant species—as reflected in matched pairs of past and current photographs. A meeting was held with the tribal members yesterday and they want to make sure there is open communication and collaboration on how the work will factor into the 2017 workplan.
  - o So far, 128 of 456 existing Stanton images have been examined (28%) from base of Glen Canyon Dam to the Little Colorado River (LCR) confluence – covering approximately 32% of river corridor
  - o Total of 256 matched pairs analyzed (1889/1890 with early 1990s and early 1990s with 2010/2011)
- Aquatic Insects. The LCR is home to most Humpback Chub (HBC) in Grand Canyon and HBC like to eat bugs. The question is whether there are more bugs, which results in more chub or fatter chub. Insect sampling has been conducted by setting sticky traps that collect the terrestrial form or the aerial forms of these aquatic insects and using them as a surrogate of in-water densities. These traps are deployed at every kilometer from the confluence all the way up to Blue Spring, five times a year. Our results show that spring is a really good time for fish to be in the LCR since there are a lot of bugs available to be eaten. The months of April and May are best with lots of bugs present, but not so many in the other months. There is also some geographic variation in bug densities. Sticky trap catches were highest near Blue Spring, declined as one goes downstream with lowest catches between river kilometers (rkms) 10-14, and increased again between rkms 5-10. These results may help explain the high growth rates and high survival rates observed in HBC translocated above Chute Falls by the USFWS. The foundation of the foodweb in the LCR is algae and plants. It turns out light conditions in the LCR vary widely. In the Upper river (where the fat chub are) the water is crystal clear, but little light gets to the water because it's so shaded. In the Lower river there is plenty of light at the water surface, but little of it gets to the river bed because of the turbidity.. The reach of the river around rkm 10 is a really bad spot for bugs because it's shady and the water is turbid. Conditions improve downstream because there is more direct sun. It's also more turbidity so you have better conditions, but not as good as upstream reaches. This work is helping us better understand what's driving the aquatic foodbase and may help explain what we're seeing with fish in terms of the distribution and timing of HBC in the LCR.
- Humpback Chub and Rainbow Trout Updates. Annual estimates of spring abundance HBC in the Little Colorado River for fish >150 mm and >200 mm declined noticeably in 2015. It is possible that these lower estimates were due to an actual decline in adult HBC population abundances, but several lines of evidence indicate reductions were due to skipped spawning. Data from passive integrated transponder (PIT) tag antennae arrays show that far fewer adult HBC entered the LCR than in recent years. We also found that the body condition of adult HBC declined beginning in September 2014 suggesting these fish had less energy to devote to reproduction. Adult HBC population abundance estimates for 2015 were similar to those observed in recent years. Juvenile HBC survival estimates in the mainstem Colorado River near the Little Colorado River confluence for the interval from July 2014 to July 2015 were similar to those observed for the July 2013 to July 2014 interval. The trend in declining abundance of rainbow trout between Glen Canyon Dam and Lees Ferry stabilized in 2015 to levels of approximately 200,000 fish. Unlike in recent years (2012-2014), the relative condition of rainbow trout has increased. In contrast to observations made last year, abundance estimates for rainbow trout near the Little Colorado River confluence have decreased below trigger levels identified in the 2011 Biological Opinion for Nonnative Fish Control. No action is warranted at this time since other triggering criteria have not been met.

- Creel and Economic Value of Angling. The objective of the project is to estimate the seasonal variation in economic value of angling at Lees Ferry and identify angler preferences that influence their experience. Results point to fewer annual trips for guided anglers and walk-in anglers above the Paria River. It is this variation in annual trips and distance traveled that allowed them to construct a demand curve in the travel cost model to estimate the economic value of angling at Lees Ferry. Preliminary estimates of angler economic value by season indicate on average angler willingness to pay in excess of trip costs is \$148 per trip in the summer compared to \$341 in the winter. The individual economic values per trip can be used with total angler visitation by season to inform management decisions.
- Green Sunfish in Glen Canyon. In July 2015, biologists with the Arizona Game and Fish Department discovered a reproducing population of invasive Green Sunfish in a slough located three miles downstream of Glen Canyon Dam. Green Sunfish are prolific (one female can produce from 2,000 to 10,000 eggs) and also voracious predators of native fish and their eggs. A rapid response action was necessary to eradicate the population before it spread downstream into critical habitat for the endangered humpback chub. After carefully analyzing alternative methods for control, agencies authorized a short-term targeted treatment with the plant-based piscicide rotenone. A treatment was conducted by AZGFD, NPS, and USGS in early November 2015. A second treatment was deemed unnecessary after subsequent surveys detected no Green Sunfish. This was a very collaborative process between many agencies and tribes and they were successful in getting rid of the Green Sunfish. Ms. Sucec said the success of this project was a result of shared vision, hard work, and cooperation from BOR, USFWS, WAPA, NPS, USGS, AZGFD, and the tribes. It was such a success that it's now a national model for rapid response to aquatic invasives. The tribes advised to not lose the momentum and start dealing with future invasive species.

Q&A:

*Q: As we've talked about the nexus of trout and HBC and the translocation of HBC to Havasu and that population becomes larger, is that part of the consideration of how you're going to be exploring the recovery or sustainability of HBC?*

*A: Yes. That's been a very involved process and I was fortunate to be invited to participate. It's been very interesting and interacting with colleagues from the upper basin and learning a lot more about these other populations. We need to understand the whole Grand Canyon in context. For native fish in the west it's kind of a shining star particularly given that in Western Canyon the vast majority of fish community there is made up of natives. We are concerned about the nexus and what's coming up from Lake Powell. Both upstream and downstream reservoirs have non-natives, and we don't want them in Grand Canyon. A review of the fisheries program will be done this year and one item for discussion is the appropriate level of monitoring needed.*

*Q: Are you assuming a spawn was missed because of that low condition which is the result of foodbase decline in that section of the river?*

*A: Yes, we think the lower condition observed in adult HBC has been the result of a decline in the aquatic foodbase in the mainstem. This same decline in the aquatic foodbase was also responsible in part for the decline in trout observed in Glen and Marble Canyons. For trout it was a combination of fewer groceries as well as an over-abundance of trout.*

*Q: I don't see a lot of relationship between the numbers of HBC and the numbers of trout down at the LCR. Is that your observation as well?*

*A: When you have really high numbers of trout down there, you affect juvenile HBC survival rates. Some of the modeling that went into the LTEMP showed that. We had very high numbers down there but we also had a lot of juvenile chub in the system. That may have been masking that effect. It's not a one-to-one thing. It's also tied to temperature, warmer water results in faster growth which helps juvenile HBC move more quickly through size classes where they are more vulnerable to predation by trout.*

*Q: Can you characterize how those trout removal triggers will change as proposed in the LTEMP?*

*A: The idea with the revision of the triggers is to not completely remove mechanical removal from the toolbox but leave as a mechanism of last resort and have a two-tier approach. The first tier saw declines in the HBC population and we would do things to benefit HBC, more translocations or other efforts, so we're benefitting the chub directly rather than indirectly. But then if things get worse, you would move to a second tier which would include tools like mechanical removal.*

*Q: Have you factored in seasonal flooding that created a loss of HBC as the waters from the LCR come in? Has there been any evidence of HBC being washed out of the LCR and being seen downstream?*

*A: Charles Yackulic will be leading an ongoing effort this summer to mark small HBC to determine if these fish get moved to the mainstem when monsoon season kicks in and the Little Colorado River starts flooding. Randy Van Haverbeke (USFWS) has suggested that the lack of floods may affect spawning. In years when no spring flood has occurred, when there isn't much snowpack for example, there have been fewer juveniles and less spawning. It could be the lack of floods is a negative effect because all the minerals coming out of the springs coat the rocks and covers up the spawning substrates.*

**Humpback Chub Recovery Team Update (Attachment 7)** – Dr. Rich Valdez, SWCA, with Tom Czapl and Tom Chart, Fish and Wildlife Service via telephone. In an effort to identify activities necessary for species conservation, a new Humpback Chub Recovery Team was appointed by U.S. Fish and Wildlife Service last November. The Team consists of a Team Leader (Rich Valdez), Agency Lead (Tom Czapl), a Science Subgroup, an Implementation Subgroup, and a Writing Subgroup, for a total of 22 Team members. The Team includes stakeholder representatives on the Implementation Subgroup as an addition to previous traditional Recovery Teams. The Team is expected to meet five times and the meetings will be open to the public. A comprehensive recovery plan is expected to be delivered to the Regional Director for signature by July 2017. The Recovery Team has responsibility for producing three reports: (1) a Species Status Assessment, (2) a Recovery Plan, and (3) an Implementation Plan. Dr. Valdez said it was not the intent of the Recovery Team to make prescriptive recommendations; it is the intent of the Team to acknowledge the biological reality of the species and put forward management actions that will reduce and minimize the threat to the species and will establish demographic and recovery criteria. From that information, the Service would like to keep the flexibility within the programs themselves, allowing them to go forward and manage those issues as they deem most appropriate.

**Basin Hydrology, Operations, and 2017 Hydrograph (Attachment 8)** – Ms. Lee Traynham, Bureau of Reclamation. The Upper Basin is currently showing average snowpack for this time of year. Based on SNOTEL (Snow Telemetry) sites above Lake Powell, as of February 22, 2016, the basin snowpack was 101% of the 30-year median index, with 72% of total average accumulation on the ground. The hydrology could still shift towards either wetter than average or drier than average conditions. Lake Powell is 46% full with the other basin reservoirs at expected levels for this time of year. The April-July forecast is for Lake Powell at 94% of average at 6.70 maf, very close to what was observed in 2014 and 2015 and a little less than the 30-year average of 7.16 maf. The forecast center has a minimum probable forecast of 4.10 maf and maximum probable at 9.90 maf. There is a 10% chance that the observed seasonal inflow to Lake Powell could be above or below that range. The forecasted water year inflow volume for Lake Powell is 9.92 maf, 92% of average.

**Operations.** In 2016, Lake Powell is being operated in the upper elevation balancing tier, as determined by the 24-month study completed in August 2015. Under these conditions, the initial water year release volume from Lake Powell is 8.23 maf, with the potential for an April 2016 adjustment to either balancing or equalization releases. Given the current forecasted inflows and modeling, all three inflow scenarios (minimum, maximum, and most probable) project an April 2016 shift to balancing and a resulting release from Lake Powell of 9.0 maf. However, if the hydrology becomes significantly drier than anticipated, the April 2016 adjustment would not occur and Lake Powell would release 8.23 maf. If the hydrology becomes significantly wetter than anticipated, there would be an April 2016 adjustment to equalization and Lake Powell would release around 12.0 maf. The end of calendar year 2016 projection for Lake Mead is 1,077.5 (38% full).

**GCD Maintenance Schedule.** For 2016, five to seven units are expected to be available at any time and Reclamation anticipates having enough capacity to meet the scheduled releases for 2016. In 2017, there are expected to be seven units available for the majority of the year. Under the HFE Protocol, there is a

potential for a spring HFE if there is adequate sediment input. As of today, there is not enough sediment to trigger a spring HFE in water year 2016.

Hydrograph Development for 2017. The goals are to target lower releases in August and September with sediment coming into the system, to move releases to other equal volume months for hydropower (December and January), and to avoid shifting “extra” water to June (which cools temperatures at the mouth of the LCR). The projected release scenarios for 2017 are:

| Powell Inflow Scenario | WY 2017 Release Projection                                                                    |
|------------------------|-----------------------------------------------------------------------------------------------|
| Probable Minimum       | Upper Elevation Balancing Tier with no Projected April Shift<br>8.23 maf release              |
| Most Probable          | Upper Elevation Balancing Tier with Projected April Shift to Balancing<br>9.0 maf release     |
| Probable Maximum       | Upper Elevation Balancing Tier with Projected April Shift to Equalization<br>11.9 maf release |

Current projections for 2017 would put Lake Powell in the upper elevation balancing tier. However, the determination of the tier will not occur until August 2016, and there is still a wide range of potential releases.

**Adaptive Management Program Assessment (Attachment 9)** – Ms. Mary Orton, The Mary Orton Company. Ms. Orton said that the task order under her contract with Reclamation directed her to interview AMWG members and others, and prepare the Assessment Report that had been sent (in draft and then final) to interviewees and others. She explained that it is quite normal for a facilitator to do such an assessment to see how the group is operating together, particularly if there are new people to the group. She said the purpose of the report is to allow AMWG stakeholders to better understand each other and each other’s concerns and interests, which can help the group with their collaboration; and to invite concerns about structure and process so they can be addressed.

After the draft report was sent out for comments, she received observations from several people that the report seemed negative for a group that works so well together. She said she was surprised at this characterization, because she also felt the group has been working together well, and so she emphasized this in the final version. In fact, Ms. Orton noted in the report that stakeholders from five of the six stakeholder groups, without being prompted, said that the group worked together very well, and much better than before.

She explained that if at least one member of at least four of the six stakeholder groups mentioned an issue or concern, she considered that a significant issue and developed a recommendation about that issue or concern. She reported her recommendations for GCDAMP participants for the issues that rose to that level were:

- In order to improve mutual understanding, a recommendation that the AMWG discuss several issues that were raised, including:
  1. Dissatisfaction with how adaptive management is administered in the program, and how slowly changes are instituted.
  2. Lack of discussion of important issues, lack of input into recommendations, and the feeling that recommendations to the Secretary by the AMWG had already been decided by the time the AMWG acted
  3. Concerns that all interests are not being heard or do not have equal influence at the table.
  4. Improvements needed on the subject of tribal relationships and participation.

5. Certain disagreements about facts.
- In order to respond to numerous concerns about updating the GCDAMP long-term planning documents, a recommendation that the Secretary's Designee give the AMWG guidance regarding whether the AMWG should respond to the Secretary's goals, objectives, and priorities; or develop its own.
- Because there was widespread belief that the LTEMP ROD would significantly change the GCDAMP, schedule time for the GCDAMP participants to discuss the future of the program after the LTEMP ROD is signed.
- Because of apparent confusion, clarify policies of "DOI Speaking With One Voice" and "Non-Voting Status of DOI Agencies."

She encouraged the group to discuss these issues during the time set aside for discussion of this agenda item including:

- What were the important issues that should be discussed by the AMWG?
- For persons who felt their voices were not being heard adequately, what might be done to help that situation?
- What would enable the tribal representatives to fully participate or feel more fully a part of the program?

Ms. Gimbel said the report highlighted many AMWG strengths and just the fact that the report was written spoke highly of the group. She felt it was time to have this kind of assessment and noted that the decision to do the assessment came from Interior. She said a few people had contacted her and were concerned about what was said in the report, and she reminded them that Mary was reporting what she was told, except when she made it clear that she was offering her opinion. She said she thought the Report brought out many important recommendations for the group to consider. Ms. Gimbel reviewed the following from the report:

- Recommendation for an orientation for new members: Ms. Gimbel said the report pointed out where there were some misperceptions about the program, and an orientation would be a good idea. As a start, she has asked Jill Nagode, Reclamation's Federal Advisory Committee Act (FACA) Officer, to provide a "mini FACA 101" course during the May 25 webinar. Also, during the same webinar, Solicitor Rod Smith will make a presentation on the laws, documents, etc., that guide the AMWG.
- AMWG Retreat: There will be a new Administration in January 2017, and Ms. Gimbel said she would recommend that the new leadership consider a retreat next year.
- DOI Non-Voting status: The recommendation to have the DOI representatives be non-voting was a recommendation from the Charter AHG from two years ago. DOI is committed to being involved in AMWG discussions and she believed that DOI member involvement has not changed, even though she was one of the people at the time who was concerned about a diminishment of DOI engagement. She said she had assured the DOI representatives that she wants their candid opinions.
- DOI Speaking with One Voice: Ms. Gimbel said that the fear is that DOI speaking with one voice means DOI has already decided the policy issues in advance of meetings, but that's not the case. Pre-meetings are held to help with understanding the concerns and interests of each agency.
- AMWG's Role after LTEMP: She said that the AMWG will have the same role, i.e., making recommendations on yearly operations, science plans, monitoring plans, etc.

Comments from AMWG members and others included the following:

- *We need to capture action items from the report, synthesize areas that seem most pertinent, and work toward making progress on changes.*
- *Great job on the report. I recommend you shorten it and share it with the peer-reviewed scientific community. It is a very thorough look at how the sociology of our family works. We have had external reviews of the program, and this is a fabulous example of adaptive management. What is the most important next step?*
  - *Mary responded that in her view, discussion among the AMWG of the five issues (listed above) were the most important.*
- *Good report. Things have changed for the better in my brief tenure. There may still be some fear about litigation and people may be reluctant to share important concerns because of that fear. It would be helpful to understand more about the key interests and values of the stakeholders. It seems there are elements in our discussion that are scripted; we want to learn about your individual points of view. For example, I would love to know more about the states' "delicate balance" referenced in the Report. Going on the river trip this summer with the tribal leadership and representatives was a great way to interact with one another. We have made improvements and we can do better.*

- *It is a delicate balance between what goes on in the Upper Basin and Lower Basin and it is not always easy to discuss in a large forum like this. We need time to delve into the large issues. Don Ostler's presentation tomorrow will help explain this.*
- *I am not sure how you tease out some of the responses about what is not occurring around this table. I am here autonomously, while others have specific directions from their employer or organization. I am not sure how we get past that point, whether we are locked in based on comfort or position of stakeholder group.*
- *The previous speaker made a good point. Some of you are specialists. I am in charge of 17 million acres and this is one of many projects for me. I have to carry questions and concerns back to the tribe so our leaders can make decisions. It is not a matter of not being engaged; it is because we have to reserve decision-making for those who have that responsibility. It creates this environment in the tribal perspectives and that is something you all need to take into consideration. I am not a fish biologist; I am an archaeologist. Tribal members are concerned about how things are being disseminated throughout the administration. Some say, "Go to the website to learn more;" however, there are still tribal members who do not have electricity and so cannot go on the Internet. I am a little offended by the view that tribes are not engaged, but it does not mean I do not have an opinion. Federal agencies take that for granted. When you look at the regulations, we have to consult. I am one person of this larger body. We all have our checks and balances. I am not the enemy. I am not against science and I felt that opinion yesterday. We all need to be able to speak with one another and not make assumptions.*
- *I am an accountant by education. I have learned a lot in the three years I have been on the AMWG. I did not know what redds or juveniles were. If Scott could give a fish biology 101 and explain some of the terminology, it would better inform our discussions. It is amazing what we do not know about biology or science 101.*
  - *Scott VanderKooi (GCMRC): GCMRC's role is to provide science to this organization and a key part of that is science education. I completely understand that we have a diverse group here. We are often rushed at these meetings, and I invite you to please reach out to GCMRC and ask questions. The Wiki website ([gcdamp.org](http://gcdamp.org)) also has a wealth of information on what is occurring in the program.*
- *I am really taking to heart what the previous tribal speaker said. Some of the most important things I have learned came from spending time with Arden Kucate and being invited to visit Zuni. From the standpoint that I am not a biologist or accountant, the Report has offered us the ability to talk. After I read the initial draft, I had concerns about the written word; it was fortuitous timing when I saw David Nimkin at an event and we chatted about it. It has served its purpose to encourage us to talk and learn about each other. It is very hard when you have people who are being asked about a program when you have such a variety and diversity of why we are even here, your tenure in the program, and where do you come from as a person. We all are here for a reason. We all represent different interests. You cannot divorce what you are as a person.*
- *This is a good discussion and many of these things can be implemented. Improved cultural sensitivity and an orientation need to happen. It is difficult coming into the program and learning all the terminology. It is important to establish some type of orientation because we are a very diverse group. We have to wear multiple hats and articulate the knowledge of our worldviews and what is most sacred and precious to us as a people. This could be the start of an orientation. One of the first teachings I received is that I am a tribal member first and then come my other roles in the professional world. I cannot only wear the professional hat and then wear the tribal hat later. It would be good to have that dialogue.*
- *I know how to work within the confines of the tribes. I would suggest more presentations like what Hopi did today. It might also be nice to have the tribal representatives present about how they have to report back for decisions. There are many levels within some tribes. For example, Hopi villages have greater sway than the government. It might help this body to not only improve their cultural understanding, and also have the tribes help us figure out how to get things done.*
- *It would be helpful to hear about the DOI discussions during their pre-meetings and their critical decisions.*
  - *Ms. Gimbel replied that the history of the "one voice" policy started when Secretary Salazar was executive director of the Colorado Department of Natural Resources and had two water agencies sniping at each other in public. He said that would not happen any more. It is not that we make decisions behind closed doors; it is more that we are communicating with each other in advance. DOI agencies have different missions, and Secretary Salazar said we were to work as a team. She said she has seen improvements in that teamwork.*
- *The pre-AMWG meeting gives us an opportunity to walk through the agenda and discuss potential issues. Making plans for a retreat in the next Administration seems right to me.*
- *I have been involved with this program since the beginning and helped write the plan for the GCDAMP for the first EIS. At the time, the intent was to put together this diverse group of stakeholders that come together with a shared vision that moves us into the future. I see in the room a half dozen folks who were involved in those early discussions; they know that we struggled to make sure that everyone still has that shared vision. Of course we need an orientation. Maybe we also need a "buddy" system for new members. Jason's attempt at*

*the Wiki page was to try to memorialize these things for new members. There is strength in what this group brings together, and I also think that it is important that sometimes we sit next to someone we do not know. It is important to remember where we have been and where we are going as well.*

- *As a stakeholder, I support the DOI agencies not voting. In my view, they participate very well in our discussions. I feel my job is to push back carefully, and the federal agency representatives' job is to explain.*
- *One aspect of this committee that is not fully appreciated is its influence on recovery planning, including stakeholder involvement and drafting the recovery planning documents.*

Jill Nagode, Reclamation's FACA Officer, said she was impressed with how the AMWG was run. She joked that she wanted a chub as a pet. She said she was impressed that members wanted to be part of the assessment. She said the AMWG is the gold standard for Federal Advisory Committees (FACs) within Reclamation and DOI, and maybe even GSA. For years, AMWG was the largest and the most expensive of FACs, and even though with every election, Congress closely examines costs and committees, AMWG has never been targeted. She said AMWG's work was praised in reports every year. The stability of this committee has stood on its own. The AMWG website is an example for others: while the Committee Management Secretary acknowledges the AMWG is a large committee, she often directs other FAC staff to the AMP website to see what work is being done, how the meeting minutes are written, and how the meetings are being facilitated. She said the assessment proves that the members want to do better and are not afraid to address problems. She noted that there are 113 FACs in DOI and to be named one of the best is an achievement.

**Farewell to Beverley Heffernan.** Ms. Gimbel congratulated Bev Heffernan on being such an exemplary public servant and for what she has given to the United States, Reclamation, and the AMWG. She praised Bev for her sense of humor and always telling people what she thinks. She has been a great resource.

- Mr. Rhees recalled that Bev once told him "that if you want something really, really bad, that's how you're going to get it." He worked with her for many years in the Provo Office and appreciated her hard work and being instrumental in helping Reclamation do a lot of good. Reclamation will host a retirement party for Bev in Salt Lake City.
- Mr. Billerbeck said he met Beverley five years ago and did not realize how many hobbies she had. She was even starting a new one this week: horseback archery. She has regaled him with stories of flying small aircraft, possessing a fine cellar of wine, meeting astronauts and actors, volunteering with the Sundance Film festival, and riding the Pony Express every year. He thanked her for providing the needed experience and being such an asset for the past five years on the LTEMP EIS team.
- Ms. Balsom seconded everything Rob said and presented Bev with two gift books to grace her ranch in Hurricane.

Ms. Heffernan thanked everyone for their kind thoughts and said she has really enjoyed her federal career. While she has not gotten rich being a bureaucrat, she has been able to accomplish some good things.

Ms. Gimbel invited AMWG members to participate in a group photo, and everyone to meet on the patio for a reception to celebrate Ms. Heffernan and wish her well.

**Adjourned:** 4:37 p.m.

## Glen Canyon Dam Adaptive Management Work Group Meeting

**February 25, 2016**

**Time:** 8:31 a.m.

**Conducting:** Jennifer Gimbel, Principal Deputy Assistant Secretary for Water and Science

**Facilitator:** Mary Orton, The Mary Orton Company, LLC

### Committee Members/Alternates:

Jan Balsom, National Park Service (GRCA)  
Charley Bullets, So. Paiute Consortium  
Tom Buschatzke, State of Arizona  
Chris Cantrell, Arizona Game and Fish Department  
Deborah Dixon, State of New Mexico  
Jayne Harkins, State of Nevada  
Dawn Hubbs, Hualapai Tribe  
Leslie James, CREDA  
Sam Jansen, Grand Canyon River Guides  
Lynn Jeka, Western Area Power Administration  
John Jordan, Int'l Fed. of Fly Fishers/Trout Unlimited  
Chip Lewis, Bureau of Indian Affairs

Ora Marek-Martinez, Navajo Nation  
John McClow, State of Colorado  
Eric Millis, State of Utah  
David Nimkin, National Parks Conservation Assoc.  
Don Ostler, State of Wyoming  
Daniel Picard, U.S. Bureau of Reclamation  
Ted Rampton, UAMPS  
Steve Spangle, U.S. Fish and Wildlife Service  
Larry Stevens, Grand Canyon Wildlands Council  
Tanya Trujillo, State of California  
Mike Yeatts, The Hopi Tribe  
Ora Marek-Martinez, Navajo Nation

### Committee Members Absent:

Eric Bobelu, Pueblo of Zuni  
James deVos, Arizona Game & Fish Department  
Leigh Kuwanwisiwma, Hopi Tribe

Steve Wolff, State of Wyoming  
VACANT, San Juan Southern Paiute Tribe

### USGS/Grand Canyon Monitoring and Research Center

Helen Fairley, Program Manager  
Kyrie Fry, Communications & Outreach Coordinator

Paul Grams, Program Manager  
Scott VanderKooi, Chief, GCMRC

### Interested Persons, TWG Members, and Alternates:

Adam Arellano, Western Area Power Administration  
Melinda Arviso-Ciocco, Navajo Nation  
Mary Barger, Interested public  
Rob Billerbeck, National Park Service  
David Braun, Sound Science LLC  
Kathleen Callister, U.S. Bureau of Reclamation  
Shane Capron, WAPA/TWG Vice Chair  
Bill Chada, U.S. Bureau of Reclamation  
Kerry Christensen, Hualapai Tribe  
Marianne Crawford, U.S. Bureau of Reclamation  
Kevin Dahl, National Parks Conservation Assoc.  
Kurt Dongoske, Pueblo of Zuni  
Marlon Duke, U.S. Bureau of Reclamation  
Ed Gerak, CREDA  
Katrina Grantz, U.S. Bureau of Reclamation  
Jessica Gwinn, U.S. Fish and Wildlife Service  
John Hamill, Int'l Federation of Fly Fishers/TU  
Paul Harms, State of New Mexico (phone)  
Beverley Heffernan, U.S. Bureau of Reclamation

Vineetha Kartha, State of Arizona  
Ted Kowalski, State of Colorado  
Mark McKinstry, U.S. Bureau of Reclamation  
Jill Nagode, U.S. Bureau of Reclamation  
Jessica Neuwerth, State of California  
Brent Rhees, U.S. Bureau of Reclamation  
Sarah Rinkevich, DOI Joint Tribal Liaison  
Kendra Russell, U.S. Bureau of Reclamation  
Brian Sadler, Western Area Power Administration  
Seth Shanahan, So. Nevada Water Authority  
Rod Smith, DOI Solicitor's Office  
Stacey Smith, U.S. Bureau of Reclamation  
Rosemary Sucec, National Park Service (GLCA)  
Shana Tighi, U.S. Bureau of Reclamation  
Lee Traynham, U.S. Bureau of Reclamation  
Jason Tucker, U.S. Bureau of Reclamation  
Dave Uberuaga, National Park Service (GRCA)  
Rich Valdez, SWCA  
Chris Watt, U.S. Bureau of Reclamation

**Recorder:** Linda Whetton, Reclamation

**Welcome and Administrative.** Ms. Gimbel welcomed the members and public. She offered the following comments:

- Today's start time was incorrect on the website. She apologized for any inconvenience that was caused by starting at 8:30 today. Future second day AMWG meetings held in Phoenix will begin at 8:30 as feasible.

- She thanked Ms. Callister for arranging a very nice reception for Beverley last night. Anyone who would like to contribute should talk with Ms. Callister.
- With a new administration coming in January 2017, she suggested the AMWG revisit the AMWG Operating Procedures and decide whether non-voting members should be able to make and second motions.

### **Stakeholders' Perspective: The Upper Basin States (Colorado, New Mexico, Wyoming, and Utah)**

**(Attachment 10)** – Mr. Don Ostler, Upper Colorado River Commission. The Upper Colorado River Commission is an interstate water administrative agency that was created in 1948. It involves the states of Colorado, Utah, New Mexico, and Wyoming, whose governors appoint their Commission members. The President appoints a Federal chair that is also a voting member of the Commission. Its responsibilities include conducting studies, making findings of water deliveries to the Lower Basin, determining water uses in the Upper Basin and each state, making findings of extraordinary drought and implications on the operation of the river and with Mexico, addressing salinity issues, and making determinations of shortage and the actions that need to be taken under the Colorado River Compact when those occur. The states are unique stakeholders in that the Colorado River is apportioned to the states to manage and are granted water rights for use under the 1922 Colorado River Compact. The states have to balance many different issues as they deal with water management. The Law of the River encompasses many laws, compacts, and treaties that govern all aspects of administering the water, including international relations, water quality, and environmental issues.

The Colorado River is over-allocated, based on the original allocation in 1922. Demands for water from the river have at times exceeded the supply in some areas. Balances must be made to address Upper Basin new development, climate change, sharing shortages with Mexico, ensuring compact compliance, sustaining Lake Mead uses, and endangered species and other environmental concerns. The Colorado Basin has also experienced a drought for the last 15 years (2000-2014). The basin states and Reclamation are focusing drought contingency planning on: (1) reducing or eliminating the probability of Lake Powell reaching minimum power pool elevation, (2) ensuring the continued operation of the 2007 Interim Guidelines through 2026, (3) respecting the framework for administering the use of Colorado River water in both the Upper Colorado River Basin and each Upper Basin state, and (4) combining with expected actions in Lower Basin to increase the synergistic benefits for the Basin as a whole.

The Upper Basin states' representatives joined Mr. Ostler for the discussion period that followed.

*Q: What are the sources of salinity that need to be controlled?*

*A: Mr. Ostler: Primarily water that has percolated through saline soils and agricultural uses. There have been efforts to reduce the percolation of the water through those salty soils, such as Manco soils in Utah and on the Gunnison. There have also been agricultural improvement projects to reduce the amount of return water that carry soil and salt into the Colorado River. In the Gunnison Basin, they also utilize land use control to avoid development in the Manco shell areas. These are expensive projects.*

*Q: The Upper Basin is currently using 4.5 maf out of 7.5 maf, and as you noted the water in the Colorado is over-allocated. How do you entertain proposals for additional development of water? It must be very complicated.*

*A: John McClow: There is some tension between the Upper and Lower basins on the issue of consumption, and the contention is internal as well. The State of Colorado demographer estimates that our population will double by 2050 to 10 million people which would leave us with a supply gap of around 600 kaf per year if we do not improve our efficiency. Colorado is trying to develop additional storage to capture water in wet years, and also improve efficiency while trying to not reduce agricultural activities.*

*Eric Millis: The same things are being faced in Utah. We have a 3 million population right now that is expected to be 6 million by 2060. We have some unused allocation in the river. Modeling by Reclamation shows developing up to our allocation should be feasible, and we are expecting to do that. We are also pursuing a pipeline project to transport water from Lake Powell to southwest Utah.*

*Deborah Dixon: New Mexico is fully using our allocation; however, much is used for agriculture. A large proportion of New Mexico surface water is in the northwest area in the San Juan Basin, and is being used for irrigation and other municipal uses. While our growth has slowed, we are predicted to grow significantly over the next 30 years.*

*Don Ostler: The Colorado River Compact says that the Upper and Lower basins must satisfy their uses or their needs from the water apportioned to that basin. The Lower Basin is using up to the full compact amount. The Upper Basin has not reached theirs. There is a risk of shortage and so it is a process that each state must go through to assess the risk of additional development as opposed to the frequency of shortages that may occur. It is a risk management decision that has to be made on a case-by-case basis. Additional development increases the risk of shortages. Depending on a particular state's ability or willingness to manage through shortage, that state might be willing to accept a higher risk or, alternatively, a lower risk. Just because the whole system is over-allocated, there is still allocation for the Upper Basin. Some risk of shortage might be deemed to be acceptable; how high a risk of shortage is acceptable is a judgment that has to be made by each state, based on its ability to respond to risk.*

*Q: Do the basin states recognize the forces that are contributing to climate change and address them as part of water and drought management? For example, many scientists recognize that fossil fuel burning contributes to climate change. Is there some consideration that the basin states individually or collectively would recognize and represent as part of the solution?*

*A: Mr. McClow: In Colorado, yes, we take that into account. Our water plan released in November addresses the future in scenario planning and an adaptive management approach. At one end of the scenario is the extreme and the other end is less extreme, but they are all there and climate change is identified as an issue. We understand it and we are doing what we can to eliminate the causes that we understand contribute to it.*

*Mr. Millis: In Utah, we are working with our state climatologists on what climate change might mean to our proposed projects. Utah is not pushing on the causes and the things that the state can individually do to help reduce those effects. We have an inversion problem in the winter which results in bad air quality, and measures to reduce that could potentially become measures to help with climate change. Climate change is something we are considering seriously and determining its impacts.*

*Ms. Dixon: In New Mexico, since 1992, we have been planning for the possibility of impacts of climate change. We have regional water plans for 16 regions in the state and that comprise a state water plan. The first was in 2003 and because of the drought, we are updating it now. The gap in water supply was based on a consideration of predicted climate change impacts over the 50-year period. New Mexico is also looking at the coal-fired Four Corners Power Plant and how the carbon footprint there could be reduced (though the state does not control the plant).*

*Q: You described that the river water was divided, with 7.5 maf to each of the Upper and Lower basins. What was not clear to me was the source of the other maf and what happens to them.*

*A: Mr. Ostler: We believe that the rationale in the compact was that Lower Basin tributaries provide additional water, and so the Lower Basin is allocated an additional 1 maf of water from tributaries that are below the Upper Basin. That allows for increased use in the Lower Basin to reflect those tributaries.*

*Q: How are tribes involved in some of these management decisions, discussions, and committees where decisions are made? The tribes often have some of the earliest water rights.*

*Ms. Dixon: New Mexico has been quite involved in Indian water rights settlements in the last decade. Navajo Gallup is one of the projects that resulted from the Navajo Indian Water Rights settlements. That is a strong influence in how our water is being managed and how decisions are made.*

*Mr. Millis: In Utah, most of the Indian water rights settlements are addressed by the state engineer's office in the Division of Water Rights, separate from my agency. We have two major settlements upcoming. We have had several that we have settled over the years with the Navajo Nation and also with the Ute Tribe. Those have the potential to take about half of the water that Utah believes it still has left in allocation. There is a lot of interaction with tribes.*

*Mr. McClow: In Colorado, we have reached a water rights settlement with the Southern Ute and the Ute Mountain Ute. The Animas La Plata Project, a 125,000 acre-foot reservoir, provides the resources to deliver the water that was agreed to with the Utes.*

*Ms. Gimbel: Part of Mike's question is how are tribes involved in water management. From the federal perspective, when we did the Colorado River Basin Study, the tribes were involved in our subgroups (along with the basin states and DOI). The tribes have also been involved in our implementation planning subcommittees.*

*Q: You mentioned weather modification such as cloud seeding, and how that might produce 1 maf. Where does that water come from? Will somebody else be sad to not have that rain?*

*Mr. Ostler: Cloud seeding has been a controversial measure. We recently demonstrated in the laboratory that it does actually increase the amount of precipitation. Our weather consultants have told us to expect a 5-15% increase. Wyoming recently completed a 13-year study that confirmed that 5-15% increase. The information we*

*have is that the atmospheric reservoir of water is so large that cloud seeding has a negligible effect on that reservoir. They believe that if there is any impact at all 90 miles downstream, it is probably is increasing precipitation, so it does not appear this is an issue to be concerned about.*

*Q: More than 90% of precipitation that comes into the basin evaporates. Are the states addressing or planning to address evaporation control measures?*

*Mr. Ostler: No.*

*Q: I know there is a lot of planning in the Upper Basin on drought contingency and other water issues. The Upper Colorado River Commission integrates the planning, and the states are continuing to develop their water based on their individual risk assessments. Do the states have, or plan to have, an integrated planning approach rather than four individual approaches? Is there a way that you all might say, "No, we only have this much water and we collectively have to not get below that critical level;" or is it individually based within the system? Also, is there a Lower Colorado River Commission?*

*Mr. McClow: It is a collective effort. The Upper Basin states are working together as a group because we know that the allocation in the compact is to the Upper Basin states, not to any one state individually. The Lower Basin states are similarly working on a contingency plan. It is different there because they do not have a commission, the Secretary of the Interior is the rivermaster of the Lower Basin, and all the water from Lake Mead comes under contract from the Bureau of Reclamation. We do not have that simplicity. We have a complex system of water law and water rights. Each state is a little different but they are all similar. We are working as a unit. We know that we have to work collaboratively with our sister states in the Lower Basin because otherwise it just will not work.*

*Mr. Millis: We are also working closely with Reclamation on modeling and the uses, depletions, and supplies available so that we can better understand the system as we work collaboratively.*

*Q: I recently saw that famous slide that Reclamation created of the Basin Study that shows the demand and supply curves are not going in positive directions. The presenter indicated a point at which water demand seems to be decreasing, which is very hopeful. Is there collaboration or coordination among the states to improve water conservation efforts that would reduce some of the challenges or risks that we are facing?*

*A: We are working together on the system conservation pilot program. Our state has a goal for municipal and industrial (M&I) water conservation, particularly for the use of water for outdoor landscaping. Conservation is very much a part of our plan to meet our future water needs. Our future water needs are going to principally additional M&I uses. We do not expect agricultural water needs to grow significantly, and there will be some conversion of agriculture water to M&I uses. It is a reasonable and balanced plan.*

*Mr. McClow: In addition, the Upper Basin states are collaborating on measuring the consumptive use within the states, such as establishing weather stations and other devices to produce accurate numbers on consumption, as well as targets for reducing consumption if necessary.*

*Q: It does not make sense to me that each state would not have as a primary legal directive or guidance to have sustainable water supplies. How close is each of the states to having that as a mandate? Rather than dealing with risk, which is a probability of failure, why not have a mandate guaranteeing the sustainability of water as a priority?*

*Mr. Millis: We actually do have an in-state water law provision that we must not mine groundwater. We will not use more than what naturally recharges, which is difficult. Good water management means we need not exceed the available supply. We have imported water from one area of the state into another and will continue to do such things. Some ask, "Why not just live with the water supply you have, and not import water?" We feel that if we do not need water in one place and need it in another, we can look at moving that water.*

*Mr. McClow: Colorado's legal mandate is exactly the opposite: it is based on risk. Water development based on risk is enshrined in our Constitution. "The right to divert water from the unappropriated waters of the state shall not be denied." Therefore, we work under the prior appropriation system. You can develop as much as you want to, in priority order, but at the risk of a senior water right that could curtail your use if the supply is inadequate. Our entire water law system, both for groundwater and surface water, is mandated to be a risk management operation. Could we change that? Not in my lifetime, I am sure.*

*Ms. Dixon: New Mexico is similar to Colorado, with some nuances that are slightly different. We do not have a state law that you cannot mine groundwater. Sustainability is a goal, but it is not a mandate.*

*Mr. Ostler: Some states can tolerate having a shortage once every 10 years that impacts agriculture, and the remaining 9 years having no shortage. For them, this is viewed as an acceptable risk, and maybe even higher risks are viewed as acceptable. To develop based upon zero risk is not very practical if, even with a shortage, the cities have water and there are no undue consequences. The decision-making and result are different for each state. In Nevada, they have no agriculture and so any shortage means municipal shortage. In other states with*

*agriculture, which can tolerate an agricultural shortage and insure that municipalities are supplied, perhaps that is viewed as a more tolerable risk. It is not the same strategy for every state. Risk needs to be determined in each location.*

*Q: A question came up yesterday about the states preferring experiments to management actions, because they did not want to upset the "delicate balance" among and between states. Please talk about that delicate balance and how that fits in with experiments vs. management actions.*

*Mr. Ostler: With regard to HFE experiments in which water bypasses power generation, the statutes and compacts contain provisions that govern when you can "spill" without generating electrical power. It allows only a limited a number of circumstances, according to our interpretation of the law. We do not see these high flows allowed except as an experiment. If high flows became a management action, we believe we would need to change those legal provisions so that they allowed bypassing the power plant for those general situations.*

**Tribal Liaison Report (Attachment 11)** – Dr. Sarah Rinkevich, Interior. Dr. Rinkevich provided the following updates:

- Theresa Pasqual from the Acoma Pueblo will become the second joint tribal liaison. Theresa is working on a bachelor's degree in Anthropology from the University of New Mexico with a minor in Southwestern Archaeology and Museum Studies.
- John Jordan and John Hamill made a presentation at the last tribal coordination meeting (October 2015) on the Lees Ferry Recreation Trout Fishery Management Recommendations.
- The tribes met recently to discuss the LTEMP EIS comments as requested by the Hualapai Tribal vice-president. Presentations were made by Reclamation and NPS to the individual tribes. The tribes are still reviewing the document and offered the following concerns:
  - Hualapai Tribe's concerns that HFEs are damaging the docks around Diamond Creek.
  - Trout removal remains an issue because of the desecration of life and uncertainty whether the effort is helping humpback chub.
  - The tribes were involved in writing the first EIS (1990s), and are now in a position of only giving comments.
- The Programmatic Agreement is in revision with concerns over the area of potential effect.
- The tribal representatives and Dr. David Braun feel this would be a good time for a review of the AMP cultural program because the last Cultural PEP was done in 2000.
- The tribes would like to work with GCMRC on the next budget cycle.
- Dr. Rinkevich would like to invite the Southwest Tribal Fisheries Commission to the next TWG meeting. This is a non-profit organization established to help Southwest tribes create and expand their fisheries program. Their mission is to advance tribal self-determination and tribal stewardship of fisheries resources through professional development to support tribal resource management programs. She would also like to invite the Navajo Nation's Wildlife Department to make a presentation on their program.
- Dr. Rinkevich is interested in tribal youth programs and suggested the possibility of starting an AMP tribal internship program.

**Science Advisors' Executive Coordinator FY2016 Work Plan Update (Attachment 12)** – Dr. David Braun, Sound Science LLC. The genesis of the Science Advisors (SA) program is within the Independent Review Panels (IRPs) that were created by the 1995 Glen Canyon Dam Final Environmental Impact Statement. The IRPs were responsible for periodically reviewing resource monitoring and research programs and for making recommendations to the AMWG and GCMRC regarding monitoring, priorities, integration, and management. The SA Program was established to fulfill certain IRP responsibilities with an Executive Secretary (later renamed "Executive Coordinator") assigned to lead the program. From 1998 to 2001, GCMRC assumed responsibility for many of the SAs' activities, including the proposal review process and scientific reports generated by Science Advisors. From 2002 to 2014, numerous reviews were completed, the SAs collaborated with GCMRC on the 2005 Knowledge Assessment Workshop, and the first review of the Triennial Work Plan for FY 2015-17 was completed.

In 2016, special circumstances were identified:

- No annual work plan had been developed or approved since FY2014.

- AMWG and TWG members were uncertain about SA roles.
- Program practices had evolved from 2002-14 but there was no program archive.
- The LTEMP EIS created an opportunity to review and rethink GCDAMP needs for SAs.

Also in 2014-15, as part of the restarting of the SA program, it was decided that

- Administration would be transferred to Reclamation and all services would require task orders.
- SAs were no longer to be continuously on-call but separate panels would be formed for each review or service.

The SA FY2016 Work Plan was developed in consultation with Reclamation, GCMRC, TWG leadership, and the Secretary's Designee with three objectives identified: (1) Review and update the SA Charter and protocols for the SA Program and Executive Coordinator (EC), (2) Develop and confirm the FY2017 work plan, and (3) Assist GCMRC in design and implementation of the Fisheries Protocol Evaluation Panel (PEP). The EC would also establish and maintain a program archive. Dr. Braun identified key steps to developing the FY2017 work plan and SA involvement in the Fisheries PEP.

In answer to questions, Dr. Braun said that:

- *As members of AMWG and TWG, the tribes work with both the GCMRC and the SA program to identify topics concerning cultural resource management potentially suitable for SA program review. Continued dialogue with the AMWG/TWG membership, including tribes, and GCMRC will inform the SA functions and assignments.*
- *The EC reports administratively directly to Reclamation but on all substantive matters it reports to the AMWG, and protocols for interaction with stakeholders will be established.*

Other comments included:

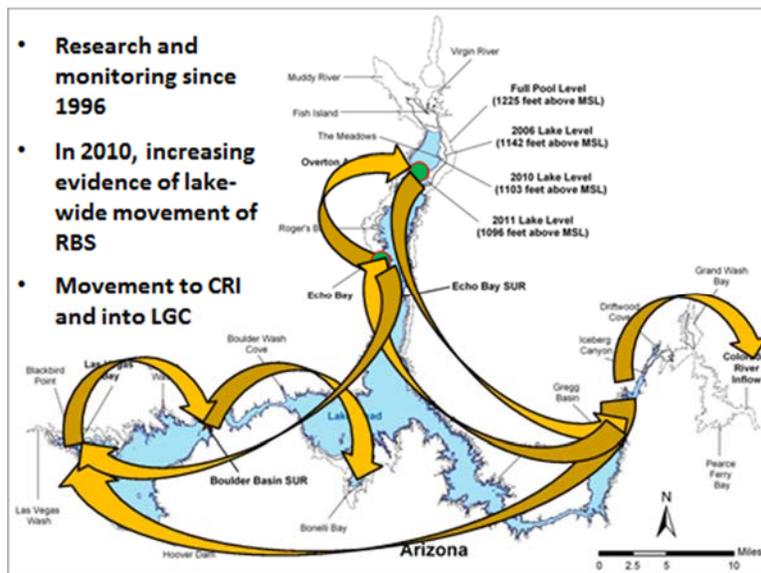
- *GCMRC internal review and oversight is needed on what other programs/literature will be built into research.*
- *SA assistance is needed in writing the AMP administrative history.*
- *The National Research Council provided one review to the AMP, published in 1999, and had previously also reviewed work along the Colorado River in 1991. The 1995 FEIS anticipated that the AMP might request the Council to perform additional reviews.*

**Razorback Sucker Research Update (Attachment 13)** – Dr. Mark McKinstry, Bureau of Reclamation. The Razorback Sucker was listed as an endangered species in 1991, critical habitat designed in 1994, a recovery plan developed in 1998, and recovery goals established in 2002. Recovery goals require two populations in Upper Basin (Green River and Upper Colorado River or San Juan River), and two populations in the Lower Basin (location not specified). Dr. McKinstry provided RBS records from Grand Canyon and an overview of RBS in Lake Mead. A science panel was created in 2010 for the purpose of obtaining advice, primarily focused on the stocking element of the conservation measures. The panel provided the following recommendations for future work in Lower Grand Canyon:

- Continue work on RBS at Colorado River Inflow (CRI) and Lake Mead.
- Do not force augmentation for political reasons.
- Use translocated wild fish (wild larvae from lake population) if augmentation is needed.
- Integrate all information on fish and foodbase in Lower Grand Canyon (LGC) and CRI.
- Expand fish surveys in LGC, especially for RBS including a larval fish study.
- Potentially sonic-tag large adult RBS and release in Lower Grand Canyon, to be able to identify habitat use, movements, and other fish.

In 2012-13, RBS records from the CRI indicate 13 untagged (wild) RBS adults were captured, 13 recaptured, and 12 larvae were captured. Also, two fish had moved upstream to Quartermaster or beyond, three moved upstream past Pearce Ferry, and one male, ripe wild fish was captured at Spencer Creek. Results obtained in 2015 revealed that fish were spawned in each year going back to 1999 that have not recruited into the population.

Objectives going forward: (1) continue monitoring the CRI, using the same methods since 2010, (2) determine RBS presence and habitat use in LGC, and (3) explore linkages between Lake Mead and LGC. The following graphic illustrates movements of RBS from around the Lake to various locations:



Larval RBS are being captured all the way to Lava Falls. They captured 476 larvae in 2014 and 81 in 2015. The Grand Canyon is unlike any other place in the basin in that it is dominated by native fish, and even the non-native fish are driven by a few small locations. Inflow habitats appear to be important for native fishes.

Q: *Why are we seeing that shift from non-native to native fish?*

A: *GRCA is a harsh place, and the temperatures are cold. There is a hypothesis that it may have started because the water warmed a few years ago.*

Q: *It appears from your sources slide that the fish from the Lower Basin are heading upstream, so somehow they are imprinted on a habitat condition and moving around.*

A: *If you go to Lake Powell, you see an even bigger story. There are fish that have been released in Green River and the Colorado River by Grand Junction that are coming down through Lake Powell, taking a turn, and going up the San Juan, banging their heads against the waterfall in the San Juan. There have also been fish that have managed to get past the waterfall and go all the way to Farmington. That is a movement of about 500 miles. Those are stocked fish that may not have been imprinted on anything.*

Q: *What predator eats the RBS and are there predators where they are moving?*

A: *In a natural environment, they are probably eaten by pikeminnow, which are no longer in this system. In the lake, striped bass eat them. The fascinating thing about RBS is that they are somehow able to avoid that predation in the lake, and Lake Mead has some big stripers. The hypothesis is that they use areas that have high turbidity for cover. So instead of staying under a tree or a rock, they are in turbid water. Most of the predators like stripers or walleye are sight feeders.*

Mr. VanderKooi added that the vast majority of fish biomass in WGC is flannelmouth sucker, which are much more likely to be eaten than the RBS.

Q: *Please mention the release of fish at Diamond Creek.*

A: *We release sonic-tagged "Judas fish" that take us to the aggregations of spawning fish. We have used that technique in the lake, and we did the same thing after 2014 with nine male fish that we released at Lava Falls. We have never had wild fish there, but some of those fish have now traveled downstream, back out into the lake, and then came back up toward Lava Falls again. Today they are releasing 10 more of these radio-tagged fish at Diamond Creek to augment the effort to figure out the location of the other wild fish. We want to identify two things: (1) the zero point in time, and (2) zero point in place. We think we have the zero point in time as far as spawning goes, but now we want to find out where they are spawning.*

Q: *What is the estimate that those larval fish you are finding would reach maturity?*

*A: They produce hundreds of thousands of eggs, but only one or two of those may eventually lead to an adult fish. The probability of a larval fish reaching maturity is very small and it is even smaller in an area with many predators.*

*Q: The AZGFD will soon hire a biologist to focus on big river fishes. We want to support this type of project with that position. Are there potentials for other additional big river fish species since we have seen some successes with RBS?*

*A: I will not answer the second question, though I have my own personal opinion. I want to say thanks to AZGFD because they contributed some of the data. You guys actually shocked up a spawning adult RBS in LGC in 2012 so we have proven that there were wild fish up there.*

*Ms. Balsom: We have looked at restoring native populations in the canyon and I think we're all talking about pikeminnow, an extirpated species that was part of the system. Our fish plan discusses feasibility assessments and we need to consider that.*

*Dr. McKinstry: There is a lot of food there for pikeminnow. I do not know if it is suitable or not. The system is currently lacking a large predator. Some people would say it would be great to do it because you have two ESA species already there.*

*C: To put a perspective on RBS, keep in mind it is a unique genus; that is, the first scientific name *Xyrauchen* is unique to this species. While there is no other species that shares that genus, it is related to what are known as the lake suckers, which are different from a flannelmouth or bluehead sucker. They have a different structure that enables them to be in reservoirs and lakes. That is what is so exciting about this work. If you look at the impounded Colorado River, and look at Lake Mead, Mojave, and some of these other reservoirs, of all the native fish that are in the system, the RBS is the only one that has persisted in these reservoirs over time. That is because of that evolutionary adaptation of that fish, which is linked to that of other lake suckers. This fish will use a reservoir in combination with an inflowing river, and this is a beautiful example of that very situation taking place. I think it is unlikely that other native Colorado fishes can do the same thing. We see some remnants of bonytail in Mojave and some remnants of Colorado River pikeminnow in Lake Powell, and certainly HBC would not reside in a reservoir. I think what Mark has discovered is an understanding of how this is linked to a lake sucker lineage that enables this particular species, RBS, to persist in Lake Mead.*

**Public Comment:** None

**Wrap-Up and Adjourn:** Ms. Jennifer Gimbel thanked everyone for their attentiveness and participation.

**Adjourned:** 11:50 a.m.

**Upcoming Meetings:**

- May 25, 2016 – AMWG Webinar
- Aug 24-25, 2016 – AMWG meeting in Flagstaff, Arizona

Respectfully submitted,

Linda Whetton  
Bureau of Reclamation  
Upper Colorado Region

## Key to Glen Canyon Dam Adaptive Management Program Acronyms

|                                                   |                                                                        |
|---------------------------------------------------|------------------------------------------------------------------------|
| ADWR – Arizona Dept. of Water Resources           | HMF – Habitat Maintenance Flow                                         |
| AF – Acre Feet                                    | HPP – Historic Preservation Plan                                       |
| AGFD – Arizona Game and Fish Department           | IG – Interim Guidelines                                                |
| AIF – Agenda Information Form                     | INs – Information Needs                                                |
| AMP – Adaptive Management Program                 | KA – Knowledge Assessment (workshop)                                   |
| AMWG – Adaptive Management Work Group             | KAS – Kanab Ambersnail (endangered native snail)                       |
| AOP – Annual Operating Plan                       | LCR – Little Colorado River                                            |
| ASMR – Age-Structure Mark Recapture               | LCRMCP – Lower Colorado River Multi-Species<br>Conservation<br>Program |
| BA – Biological Assessment                        | LTEMP – Long-Term Experimental and Management Plan                     |
| BAHG – Budget Ad Hoc Group                        | LTEP – Long Term Experimental Plan                                     |
| BCOM – Biological Conservation Measure            | MAF – Million Acre Feet                                                |
| BE – Biological Evaluation                        | MA – Management Action                                                 |
| BHBF – Beach/Habitat-Building Flow                | MATA – Multi-Attribute Trade-Off Analysis                              |
| BHMF – Beach/Habitat Maintenance Flow             | MLFF – Modified Low Fluctuating Flow                                   |
| BIA – Bureau of Indian Affairs                    | MO – Management Objective                                              |
| BO – Biological Opinion                           | MRP – Monitoring and Research Plan                                     |
| BOR – Bureau of Reclamation                       | NAU – Northern Arizona University (Flagstaff, AZ)                      |
| BWP – Budget and Work Plan                        | NEPA – National Environmental Policy Act                               |
| CAHG – Charter Ad Hoc Group                       | NHPA – National Historic Preservation Act                              |
| CAP – Central Arizona Project                     | NNFC – Non-native Fish Control                                         |
| GCT – Grand Canyon Trust                          | NOI – Notice of Intent                                                 |
| CESU – Cooperative Ecosystems Studies Unit        | NPCA – National Parks Conservation Association                         |
| cfs – cubic feet per second                       | NPS – National Park Service                                            |
| CFMP – Comprehensive Fisheries Management Plan    | NRC – National Research Council                                        |
| CMINS – Core Monitoring Information Needs         | O&M – Operations & Maintenance (Reclamation Funding)                   |
| CMP – Core Monitoring Plan                        | PA – Programmatic Agreement                                            |
| CPI – Consumer Price Index                        | PBR – Paria to Badger Creek Reach                                      |
| CRBC – Colorado River Board of California         | PEP – Protocol Evaluation Panel                                        |
| CRAHG – Cultural Resources Ad Hoc Group           | POAHG – Public Outreach Ad Hoc Group                                   |
| CRCN – Colorado River Commission of Nevada        | Powerplant Capacity = 31,000 cfs                                       |
| CRE – Colorado River Ecosystem                    | R&D – Research and Development                                         |
| CREDA – Colorado River Energy Distributors Assn.  | RBT – Rainbow Trout                                                    |
| CRSP – Colorado River Storage Project             | RFP – Request for Proposal                                             |
| CWCB – Colorado Water Conservation Board          | RINs – Research Information Needs                                      |
| DAHG – Desired Future Conditions Ad Hoc Group     | ROD Flows – Record of Decision Flows                                   |
| DASA – Data Acquisition, Storage, and Analysis    | RPA – Reasonable and Prudent Alternative                               |
| DBMS – Data Base Management System                | SA – Science Advisors                                                  |
| DOE – Department of Energy                        | Secretary – Secretary of the Interior                                  |
| DOI – Department of the Interior                  | SCORE – State of the Colorado River Ecosystem                          |
| DOIFF – Department of the Interior Federal Family | SHPO – State Historic Preservation Office                              |
| EA – Environmental Assessment                     | SOW – Statement of Work                                                |
| EIS – Environmental Impact Statement              | SPAHG – Strategic Plan Ad Hoc Group                                    |
| ESA – Endangered Species Act                      | SPG – Science Planning Group                                           |
| FACA – Federal Advisory Committee Act             | SSQs – Strategic Science Questions                                     |
| FEIS – Final Environmental Impact Statement       | SWCA – Steven W. Carothers Associates                                  |
| FRN – Federal Register Notice                     | TCD – Temperature Control Device                                       |
| FWS – United States Fish & Wildlife Service       | TCP – Traditional Cultural Property                                    |
| FY – Fiscal Year (October 1 – September 30)       | TEK – Traditional Ecological Knowledge                                 |
| GCD – Glen Canyon Dam                             | TES – Threatened and Endangered Species                                |
| GCES – Glen Canyon Environmental Studies          | TMC – Taxa of Management Concern                                       |
| GCT – Grand Canyon Trust                          | TMF – Trout Management Flows                                           |
| GCMRC – Grand Canyon Monitoring & Research Center | TWG – Technical Work Group                                             |
| GCNP – Grand Canyon National Park                 | UCRC – Upper Colorado River Commission                                 |
| GCNRA – Glen Canyon Nat'l Recreation Area         | UDWR – Utah Division of Water Resources                                |
| GCPA – Grand Canyon Protection Act                | USBR – United States Bureau of Reclamation                             |
| GLCA – Glen Canyon Nat'l Recreation Area          | USFWS – United States Fish & Wildlife Service                          |
| GRCA – Grand Canyon National Park                 | USGS – United States Geological Survey                                 |
| GCRG – Grand Canyon River Guides                  | WAPA – Western Area Power Administration                               |
| GCWC – Grand Canyon Wildlands Council             | WY – Water Year                                                        |
| HBC – Humpback Chub (endangered native fish)      |                                                                        |
| HFE – High Flow Experiment                        |                                                                        |

**GLEN CANYON DAM ADAPTIVE MANAGEMENT WORK GROUP  
ACTION ITEM TRACKING REPORT**

Updated: February 26, 2016

Note: Items marked “Closed” will be removed from the next iteration of the report.

| ITEM<br>No. /<br>DATE | ACTION ITEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ASSIGNED<br>To / DUE<br>DATE | STATUS |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|
| Item 2006.Dec.02      | <p>Secretary’s Designee Limbaugh directed the Roles AHG to address Dr. Garrett's recommendations:</p> <ol style="list-style-type: none"> <li>1. Develop improved methods and/or procedures for managers to establish and articulate priorities for specific 3-5 year time intervals.</li> <li>2. Develop improved methods for managers and scientists to permit effective tradeoff assessments.</li> <li>3. Develop more effective scientist/managers collaborative working procedures.</li> <li>4. Implement methods to monitor and improve the adaptive management process.</li> <li>5. Implement methods to define future conditions for the CRE resources of concern.</li> </ol> <p><b>2/19/14 Update:</b> This will remain open as some items may evolve as the LTEMP EIS nears completion and have a better idea of where the science priorities are going as a result of the new long-term plan.</p> | Roles Ad<br>Hoc<br>Group     | Open   |
| Item 2012.Aug.01      | <p>Glen Knowles will work with Anne Castle to compare the 2004 AMWG/TWG priorities and the Secretary’s Designee’s priorities as established in 2011. The Secretary’s Designee will report to AMWG on the results of this comparison.</p> <p><b>2/19/14 Update:</b> The science plan for the LTEMP EIS will establish the science priorities looking forward and is an independent process from the AMWG. Upon completion of the LTEMP, the AMWG would reconsider science priorities to integrate with the LTEMP and a possible referral to the TWG.</p>                                                                                                                                                                                                                                                                                                                                                     | G. Knowles<br>A. Castle      | Open   |

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Form**  
**May 25, 2016**

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Agenda Item

Science Advisors: Charter, Protocols, and FY17 External Review Topics

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Purpose

The information and discussion on updating the Science Advisors Program Charter and Protocols, and on topics being proposed for external Science Advisor review in FY17, is designed to prepare AMWG members to make recommendations to the Secretary in August 2016 on

- the Science Advisors Program Charter and Protocol, and
- the Science Advisors program work plan and budget, which will be part of the FY17 GCDAMP Reclamation work plan and budget.

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Action Requested

Feedback requested from AMWG members.

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Presenters

David Braun, Executive Coordinator for GCDAMP Science Advisors  
Vineetha Kartha, Technical Work Group Chair and AMWG Alternate from State of Arizona

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Previous Action Taken

- ✓ By Bureau of Reclamation: As a result of a competitive bid process, Reclamation chose David Braun of Sound Science LLC in 2015 as the Executive Coordinator of the GCDAMP Science Advisors. As part of Dr. Braun's FY16 work plan, he was to update the Science Advisors program charter and protocol for review and action by the Technical Work Group (TWG) and the AMWG. Additionally, he was to identify topics for external Science Advisor expert panel review in FY17, which the AMWG will be asked to recommend to the Secretary as part of the FY17 Reclamation work plan.
- ✓ By TWG: TWG considered a draft updated Science Advisors Program Charter and Protocol and recommended several revisions. The draft that is attached here includes those revisions, which will be considered by the TWG in June.

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Relevant Science

N/A

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Summary of Presentation and Background Information

**Science Advisors Program Charter and Protocol**

Dr. Braun, Executive Coordinator for GCDAMP Science Advisors, prepared a draft updated Science Advisors Program Charter and Protocols (attached) that incorporates all program guidance previously approved by the AMWG, including the original Science Advisors program charter and protocols (2000) and all subsequent amendments. The update also incorporates standards from the

Office of Management and Budget (2004) on federal external reviews, as well as changes specified in the Scope of Work issued by the Bureau of Reclamation for the new Executive Coordinator contract in 2015.

The TWG reviewed the draft at its April 2016 meeting and made several suggestions for revisions. The Executive Coordinator has incorporated the TWG feedback into a revised version, which is attached. At its June meeting, the TWG will consider the revised version for a recommendation to the AMWG for action at the August AMWG meeting.

The presentation by Dr. Braun and Ms. Kartha will describe the document and the updating process, to assist the AMWG in its initial review of the updated document.

### **FY17 Science Advisors Program Work Plan**

The Science Advisors program was inactive for most of FY15 and previously had not consulted closely with the TWG or the AMWG for several years on topics for external Science Advisors review.

As stated in the Science Advisors program charter, the purpose of the program is to conduct reviews of GCDAMP monitoring and research programs, and carry out other advisory tasks as requested, in order to provide recommendations to the AMWG and the Grand Canyon Monitoring and Research Center regarding monitoring, priorities, integration, and management of natural, cultural, and recreational resources affected by Glen Canyon Dam operations. These actions help ensure that the monitoring and research findings used by the AMWG and the Secretary in implementing the GCDAMP are timely, comprehensive, efficient, unbiased, objective, scientifically sound, and meet the needs of the GCDAMP.

The presentation by Dr. Braun will summarize the topics under consideration for Science Advisor review in FY17, the final version of which the AMWG will be asked to recommend to the Secretary as part of FY17 Science Advisors work plan, which will be included in the Reclamation work plan.

The topics under consideration for external review in FY17 are as follows:

1. **State of Knowledge:** What is the current state of knowledge concerning Strategic Science Questions (SSQs), Core Monitoring Information Needs (CMINs), Research Information Needs (RINs), Desired Future Conditions (DFCs), and adaptive management triggers? Where are the most important certainties and uncertainties in this body of knowledge? How might the SSQs, CMINs, RINs, and DFCs be updated, especially with the start of the LTEMP? How might the adaptive management process be strengthened?
2. **Cultural Resources:** What additional best practices might the AMP implement to better incorporate Native American traditional knowledge into the information it takes into account in arriving at its decisions concerning dam operations, species management, other activities, and their impacts over which the AMP has responsibility, including best practices to document traditional knowledge to ensure its comprehensiveness and usability for the AMP?
3. **Draft Triennial Work Plan for FY 2018-2020:** Are there ways the investigative activities proposed in the draft Triennial Work Plan might be strengthened to produce information that is more timely, comprehensive, efficient, unbiased, objective, or scientifically sound to meet AMP needs for guiding adaptive management decisions?

# Glen Canyon Dam Adaptive Management Program, Science Advisors Program Charter and Operating Protocols Update, 2016

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This document updates the Glen Canyon Dam Adaptive Management Program (GCDAMP) Science Advisors Program charter and operating protocols. It incorporates the original “Operating Protocols, GCMRC Science Advisors” prepared by the Grand Canyon Monitoring and Research Center (GCMRC), approved by the GCDAMP Adaptive Management Work Group (AMWG) in December, 2000. That original document is included below as Appendix I. The update also incorporates two amendments to the original document: “Additions to the GCDAMP Science Advisors Operating Protocol (12/2000),” approved by the AMWG in 2004 and included below as Appendix II; and “Adaptive Management Work Group Briefing Paper on Science Advisor Appointments for 2010-2012,” approved by the AMWG in 2009 and included below as Appendix III.

The update also incorporates information from two other documents. First, it incorporates guidelines from the U.S. Office of Management and Budget (OMB), 2004, “Final Information Quality Bulletin for Peer Review,” included below as Appendix IV. Second, it incorporates crucial information from the U.S. Bureau of Reclamation, May 2015, “Solicitation No. R15PS00518, Executive Coordinator Science Advisory Services IDIQ.” This latter document governs changes to the Science Advisors program associated with the transfer of administrative responsibility for the program from the GCMRC to the U.S. Bureau of Reclamation, Upper Colorado Region, Environmental Resource Division (Reclamation) in FY 2015.

Finally, the update incorporates recommendations for additional modifications reviewed and approved by the GCDAMP Technical Work Group (TWG) in 2016. These recommendations include changing the terms, Science Advisors program and Science Advisor panel, to Science Advisors Program and Science Review Panel, respectively.

A brief history of the origins and evolution of the Science Advisors Program, 1995-2015, is included with this document as background information on the need for the present update. This brief history appears at the end of the document, as Appendix V.

## 1. Science Advisors Program Charter

The purpose of the Science Advisors Program (SAP) is to periodically conduct reviews GCDAMP resource-specific monitoring and research programs, and carry out other advisory tasks as requested by the AMWG, in order to provide recommendations to the AMWG and the GCMRC regarding monitoring, priorities, integration, and management of natural, cultural, and recreational resources affected by Glen Canyon Dam operations. The SAP engages Science Review Panels to conduct reviews and/or carry out advisory tasks to: (a) ensure that the monitoring and research findings used by the AMWG and the Secretary of the Interior (Secretary) in implementing the GCDAMP meet the information needs of the GCDAMP; and (b) ensure that the information on which the AMWG and the Secretary base their adaptive

management decisions is timely, comprehensive, efficient, unbiased, objective, and scientifically sound. The Science Review Panels are advisory and not decision making bodies.

An Executive Coordinator leads the SAP and serves as the liaison officer for the SAP to the AMWG, TWG, and GCMRC. The Executive Coordinator is an individual contracted by Reclamation with a demonstrated ability to retain and manage science and other review panels, knowledge of scientific programs and methods related to the study of large river ecosystems, ability to work in a committee environment, and ability to work in an interdisciplinary setting. The Executive Coordinator may not otherwise be a participant in the GCDAMP or in GCMRC monitoring and research activities.

The Executive Coordinator establishes a separate Science Review Panel for each review or advisory service approved by the AMWG. The Executive Coordinator may propose and the AMWG may approve establishing panels that operate within a single fiscal year to accomplish short-term tasks. The Executive Coordinator also may propose and the AMWG may approve establishing panels that operate over a whole- or multi-year timespan to address needs for ongoing or recurring review or advisory services, or for the flexibility to respond quickly to urgent service requests. Each Science Review Panel will be sized for the efficient completion of its assigned review or advisory task by individuals with the expertise needed to carry out the assigned task.

The SAP conducts reviews or provides other advisory services on request from the AMWG in consultation with the GCMRC and the TWG, and delivers the resulting reviews or advice to the AMWG through reports and presentations. The AMWG in consultation with the GCMRC and TWG may request the SAP to review and provide advice or recommendations concerning, among other matters:

- (1) Interim or final results or syntheses and assessments of results of monitoring and research activities carried out to meet the information needs of the GCDAMP concerning natural, cultural, and recreational resources affected by Glen Canyon Dam operations and the effects of those operations, to evaluate whether the best information is being provided to meet these needs, including whether the investigations focus on the right questions for which the GCDAMP needs answers to carry out its mission;
- (2) The protocols followed in monitoring and research activities carried out to meet the information needs of the GCDAMP, including 5-year reviews of these monitoring and research protocols;
- (3) Long-term and annual plans and budget proposals for monitoring and research activities to be carried out to meet the information needs of the GCDAMP; and
- (4) Any other topics for which the AMWG requests additional, independent information concerning resources affected by Glen Canyon Dam operations and the effects of those operations, options for managing these effects, coordination and balancing among resource programs, and the combined effectiveness of these programs in advancing understanding of the Colorado River ecosystem and ensuring progress in defining and conducting adaptive management experiments.

The SAP does not review, interpret, or otherwise evaluate public policy decisions or assess legal compliance associated with the GCDAMP and activities of the AMWG, TWG, GCMRC, or individual member agencies and organizations.

## **2. Protocols: Executive Coordinator Roles**

The Executive Coordinator serves as the SAP manager and liaison to the AMWG, TWG, and GCMRC, as stated above. The Executive Coordinator prepares work plans and budgets, manages and completes task orders, and manages and reports on activities and deliverables to a Contracting Officer in Reclamation through a Contracting Officer Technical Representative (COTR). The contract between Reclamation and the Executive Coordinator establishes the details of the contractual relationship between the two parties.

The Executive Coordinator oversees and administers the activities of the SAP in the performance of task orders issued by Reclamation for specific reviews or advisory services approved by the AMWG. The Executive Coordinator ensures the completion of the required tasks and deliverables for these task orders. The activities of the Executive Coordinator in turn are themselves governed by task orders.

The duties of the Executive Coordinator may include the following. This list is representative of requirements, but not all-inclusive. The actual requirements will be defined in the Statement of Work issued by Reclamation for each Executive Coordinator task order.

- (1) Identify the discipline(s) required by each task order to provide the review or advisory services required by the task order; identify the number of Science Review Panel members and the types of review or advisory services needed for each task order; identify potential Science Review Panel members, following the criteria and process for Science Review Panel Selection described below; and work with the COTR to agree upon the final list of Science Review Panel members to work on each task order.
- (2) Enter into contracts/agreements to secure the required services of the individuals who will serve on each Science Review Panel and provide appropriate administration of these contracts/agreements including ensuring suitable performance.
- (3) Provide administrative support (i.e., travel, expenses, and report production) for Science Review Panel activities.
- (4) Recommend replacements for Science Review Panel members as necessary in response to resignations, non-performance, etc.
- (5) Recommend the use of supplemental Science Review Panel members for individual task orders if necessary.
- (6) Develop, recommend, and coordinate the review procedures and performance schedules of all Science Review Panels.
- (7) Serve as a Science Review Panel member when appropriate on specific task orders, based on the selection criteria for Science Review Panel as indicated in its authorizing task order.

- (8) Annually solicit requests for SAP activities for the upcoming fiscal year from the AMWG and solicit additional suggestions for such activities from the TWG and GCMRC; compile the resulting requests and suggestions into specific potential review or advisory activities; and propose a prioritization (ranking) of the resulting potential review or advisory activities for the upcoming fiscal year.
- (9) Prepare and submit to the TWG and AMWG an annual work plan and budget for SAP activities in accordance with Reclamation and GCDAMP budget and work plan schedules.
- (10) Implement the annual SAP work plan following review by the AMWG and GCRMC and approval by the AMWG as part of the GCDAMP budget and work plan.
- (11) Coordinate and direct all Science Review Panel assignments, work tasks, and writing requirements.
- (12) Maintain an archive of SAP reports, meeting summaries, correspondence, etc., and deliver the archive to Reclamation at the end of the Executive Coordinator contract.

The Executive Coordinator must also meet the following contractor requirements as specified by Reclamation:

- (1) All work and invoices must be approved in advance in the form of task orders from the COTR prior to work being performed.
- (2) Work in excess of that defined in a task order must be approved by the COTR and Contracting Officer prior to initiation.
- (3) The contractor will work with the COTR in defining additional tasks for which a modification of an existing task order is required. Modifications must be authorized by Reclamation, must be approved by the Contracting Officer, and are dependent on available funds.

### **3. Protocols: Annual and Multi-Annual Work Plans**

The Executive Coordinator will develop annual and multi-annual work plans as parts of the annual and multi-annual planning process of the GCDAMP as a whole, and develop the budget for the Science Advisors Program in cooperation with Reclamation. The SAP annual work plan will include all tasks to be carried out by the Executive Coordinator, including the implementation of task orders for individual Science Review Panel services.

The fiscal-year cycle of development of the SAP annual work plan will include the following:

- (1) October-March: Solicit requests or suggestions for GCDAMP review/advisory needs from the AMWG, TWG, GCMRC, and Secretary's Designee for the upcoming fiscal year. The Executive Coordinator may ask those who make specific requests or suggestions to provide a written prospectus with sufficient information to enable the Executive Coordinator to assess the feasibility and potential costs of implementing the

suggestion/request. The Executive Coordinator may also work directly with those who make specific requests or suggestions to help them develop a complete prospectus.

- (2) March-April: Compile the resulting requests and suggestions into a list of specific potential review or advisory activities for the SAP for the upcoming fiscal year; assess the feasibility and potential costs of implementing the suggestion/request and use this information to prioritize all suggestions and requests (see criteria below); and consult with the AMWG, TWG, GCMRC, and Reclamation on the resulting prioritized list of potential reviews and advisory activities.
- (3) April-June: Work with Reclamation and the TWG to develop a final list and ranking of SAP activities for the upcoming fiscal year and a budget for each potential activity, consistent with available funding. The budget for the SAP will be reviewed by the TWG as part of the overall Reclamation budget within the GCDAMP budget.
- (4) June-August: Work with Reclamation, the GCMRC, and the TWG to prepare the final proposed SAP work plan and budget for the upcoming fiscal year for presentation to the AMWG at its August meeting for a recommendation to the Secretary as part of the GCDAMP budget and work plan.

The GCDAMP also periodically develops multi-year (e.g., triennial) work plans and budgets. Such GCDAMP multi-year master work plans will include a multi-year work plan for the SAP. The development of the multi-year work plan for the SAP, to be included in the GCDAMP master multi-year work plan, will follow the schedule for development of the master multi-year work plan.

The Executive Coordinator will rank prospective reviews/advisory services for each upcoming fiscal year based on the potential for the findings to:

- Synthesize multiple knowledge inputs, data, methods, models, and assumptions used by the AMWG and the Secretary in implementing the GCDAMP;
- Clarify uncertainties in the available information that have the potential to affect adaptive management decision making within the GCDAMP, or suggest ways to reduce these uncertainties;
- Ensure that the information on which the AMWG and the Secretary base their adaptive management decisions is timely, comprehensive, efficient, unbiased, objective, and scientifically sound;
- Improve the transparency of decision making within the GCDAMP; or
- Improve stakeholder or public perceptions of the credibility of the information on which the GCDAMP makes decisions.

Five types of tasks will routinely appear in the SAP annual work plan or will routinely be considered for inclusion in the annual work plan when they rank highly on the criteria stated above:

- (1) The work plan for every fiscal year will include a task covering the development of the work plan and budget for the next fiscal year.
- (2) The AMWG or the GCMRC may request that the Executive Coordinator or a Science Review Panel review GCMRC long-term monitoring plans, annual monitoring and research plans, and/or annual budget proposals.
- (3) The GCMRC or the AMWG may request that a Science Review Panel review the information presented at the Annual Reporting meeting.
- (4) The GCMRC or the AMWG may request that the Executive Coordinator participate in planning and implementing PEPs, including the selection of panel members based on the criteria for Science Review Panel selection (see below).
- (5) The AMWG, TWG, GCMRC, or Reclamation may request that the Executive Coordinator attend any of two AMWG meetings and any of 3-4 TWG meetings annually.

#### **4. Protocols: Science Advisor Program Task Orders**

The SAP work plan and budget for each fiscal year will identify the individual reviews or advisory services to be carried out in the fiscal year. Each review or advisory service will be implemented through a task order specifying the objectives, procedures, deliverables, and budget for that task. The schedule for each task order will allow the time necessary for Reclamation and the Executive Coordinator to establish the details of the task order, for Reclamation to authorize the task order, and for the Executive Coordinator to recruit members for the Science Review Panel for the required task(s) following authorization of the task order.

The Executive Coordinator and Science Review Panel members will be reimbursed for travel expenses necessary to complete all task orders, including per diem for lodging, meals, and incidental expenses during necessary travel. Reimbursement will follow General Accounting Office (GAO) rules. The Science Advisors Program will also provide Science Review Panel members with an honorarium for service, unless an individual member is a federal employee or otherwise prohibited from receiving such compensation. The amount of this compensation will follow U.S. Geological Survey (USGS) practice. If appropriate, a task order may require that Science Review Panel members participate in an informational river trip on the Colorado River to familiarize them with the ecosystem.

The Executive Coordinator will implement the task orders for each fiscal year, assemble the required Science Review Panels, manage the review or advisory process, and ensure the timely completion and delivery of Science Review Panel reports.

#### **5. Protocols: Science Review Panel Selection**

The Executive Coordinator will follow these steps to establish each Science Review Panel:

- (1) Review the selection criteria that apply to all GCDAMP Science Review Panel members (see below) and identify additional selection criteria relevant to the task at hand.
- (2) Solicit recommendations from the AMWG, GCMRC, and TWG for (a) additional Science Review Panel selection criteria relevant to the task at hand, and (b) recommendations for potential Science Review Panel members.
- (3) Consult the professional literature and seek advice from professional colleagues outside of the GCDAMP to identify additional potential Science Review Panel members.
- (4) Assemble a list of potential Science Review Panel members along with information on their professional title and place of work, contact information, web sites, areas of significant expertise, experience as an external reviewer, and any other information that will help assess their suitability for the task at hand.
- (5) Rank the resulting list of potential Science Review Panel members on their appropriateness and potential value for the task at hand based on the criteria assembled in the first two steps.
- (6) Ask the GCMRC and TWG to review the resulting list and ranking and provide recommendations on (a) names of potential Science Review Panel members to add to or remove from the list, and (b) the relative ranking of the potential Science Review Panel members to consider.
- (7) Submit to the Reclamation COTR for administrative review the ranked list of proposed Science Review Panel members for the task at hand, and work with the COTR to mutually agree upon the final list of Science Review Panel members for the task.
- (8) Contact the top-ranked individuals to determine their availability, working down the ranked list until the desired Science Review Panel size and composition are reached, and notify the AMWG, GCMRC, and TWG of the results of the selection process.

The Executive Coordinator will select the members for each Science Review Panel task based on the following core criteria, consistent with U.S. Office of Management and Budget, 2004, “Final Information Quality Bulletin for Peer Review” (see Appendix III, below):

- Expertise: All Science Review Panel members must have the knowledge, experience, and skills necessary to perform the review or advisory task at hand. The Executive Coordinator will select Science Review Panel members with well-established expertise in the fields of knowledge central to the task at hand as indicated by their records of education, experience, publications in the peer-reviewed literature, or other relevant, demonstrable achievements. All Science Review Panel members must be actively involved in the field(s) of knowledge relevant to the task at hand. In cases where the subject matter being reviewed spans a variety of areas of knowledge or technical expertise, the Executive Coordinator will select Science Review Panel members who together represent the necessary spectrum of knowledge.

- Balance: A range of respected scientific and technical viewpoints may exist regarding the available literature and knowledge concerning the subject at hand. The Executive Coordinator will select Science Review Panel members to represent the diversity of perspectives relevant to the task at hand, potentially including expertise in the following disciplines: adaptive management; anthropology/Native American studies; archaeology; fisheries biology and ecology; ecosystem/riparian ecology; geomorphology; GIS/remote sensing; hydrology; aquatic ecology/limnology; and socio-economics.
- Independence: The Executive Coordinator will select Science Review Panel members whose own work will not be affected by the outcome of the task at hand. The potential may exist for such dependence when there is a potential conflict of interest (see below) or a potential inter-dependence of interests among prospective panel members that could affect the objectivity of a panel member.
- Ability to Collaborate: All Science Review Panel members must have a demonstrated ability to work effectively, respectfully, and collaboratively with other members in an interdisciplinary environment as indicated by a record of successful participation in peer-review panels and similar professional service.

The following conditions also apply:

- Science Review Panel members may include employees of federal agencies including other USGS offices, state agencies, academia, or the private sector, so long as these individuals do not do so as representatives of any member or the AMWG or TWG (see below), and so long as no conflict of interest exists (see below). Federal employees will adhere to all federal rules and principles of ethical conduct (5 C.F.R §2635.101(b)).
- Science Review Panel members will not be selected or asked to serve as representatives of any particular agency, organization, or other stakeholder group.
- Science Review Panel members must recuse themselves from bidding on proposals funded by the GCDAMP for one year after their term of service is completed.
- Science Review Panel members must not participate in any review or advisory task that presents a conflict of interest, and must not be a participant in the GCDAMP or in GCMRC monitoring and research activities. The Science Advisors Program follows The National Academy of Sciences guidelines on conflicts of interest,<sup>1</sup> as recommended by the U.S. Office of Management and Budget, 2004, “Final Information Quality Bulletin for Peer Review” (see Appendix III). Science Review Panel members will be asked to sign a “Conflict of Interest” statement as a requirement of their service.

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<sup>1</sup> National Academy of Sciences, “Policy and Procedures on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports,” May 2003: Available at: <http://www.nationalacademies.org/coi/index.html>.

## **6. Protocols: Science Advisor Program Reporting**

The Executive Coordinator will present progress reports on the SAP tasks active in each fiscal year to the AMWG at its February and May meetings, and an annual report to the AMWG at its August meeting. The Executive Coordinator will also present progress reports on the tasks active in each fiscal year to the TWG at least at its January and June meetings.

The Executive Coordinator will submit an annual report to Reclamation at the end of each fiscal year, covering work on all task orders active during the fiscal year.

## **7. Protocols: Amending the Charter and Protocols**

Changes to this charter or its protocols may be proposed to the TWG, which will then review each proposal and convey to the AMWG any recommendations for changes. The Executive Coordinator must provide recommendations to the TWG on each proposal, for consideration by the TWG during its review. Reclamation must review all proposed changes to ensure that they are consistent with Reclamation requirements as administrator of the Science Advisors Program, and convey its findings to the AMWG. All amendments require a recommendation to the Secretary by the AMWG, which may request further information from the TWG, GCMRC, or Executive Coordinator for its deliberations. The Secretary must approve all changes.

## Appendixes

### Appendix I: December 2000 Operating Protocols

DRAFT

**GCMRC SCIENCE ADVISORS**

**FINAL**

**December 2000**

**INTRODUCTION**

The final Environmental Impact Statement on the Operation of Glen Canyon Dam calls for the Secretary of the Interior in consultation with the Adaptive Management Work Group to establish Independent Review Panel(s) (IRPs) (pg. 37-38) to:

- (1) annually review resource specific monitoring and research programs initiated by the science center [Grand Canyon Monitoring and Research Center (GCMRC)];
- (2) make recommendations to the Adaptive Management Work Group (AMWG) and the GCMRC on the long-term monitoring and research program regarding priorities, integration, and management;
- (3) conduct a five-year review of monitoring and research protocols; and
- (4) provide other such scientific and technical advice as may be requested by the GCMRC, the AMWG, or the Secretary.

The GCDEIS states that the IRPs should “ be comprised of qualified individuals not otherwise participating in the [GCMRC] long-term monitoring and research studies.”

GCMRC has responded to the GCDEIS call for IRPs by:

Establishing an independent, external peer-review process for all proposals received by GCMRC and scientific reports resulting from GCMRC activities.

- (2) Initiating a contract with the National Research Council (NRC) for review of the GCMRC Long-term Strategic Plan and GCMRC FY 98 and FY 99 Annual Plans that resulted in the 1999 NRC report, "Downstream: Adaptive management of Glen Canyon Dam and the Colorado River Ecosystem."
- (3) Developing Protocol Evaluation Program (PEP) for reviewing long-term monitoring protocols.

## **NEED**

The current IRPs established by GCMRC do not fully address the responsibilities identified in the GCDEIS. An IRP is still needed

“ . . . for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and the Center [GCMRC] regarding monitoring, priorities, integration, and management.”

## **PURPOSE**

The group of Scientific Advisors is being established to increase the efficiency and quality of the science being developed by GCMRC and used by the AMWG and the Secretary. The Scientific Advisors will provide independent scientific oversight and technical advice to ensure that GCMRC science programs are efficient, unbiased, objective, and scientifically sound.

The Scientific Advisors individually will be expected upon request, among other things, to review and comment on:

- (1) results of ongoing and completed monitoring and research program activities, as well as any synthesis and assessment activities initiated by GCMRC,
- (2) the appropriateness of GCMRC's RFPs, especially their responsiveness to management objectives,
- (3) the protocols used in GCMRC sponsored scientific activities, including a 5-year review of GCMRC monitoring and research protocols,
- (4) GCMRC's long-term monitoring plan,
- (5) GCMRC's annual monitoring and research plans,
- (6) GCMRC's annual budget proposals, to ensure that the science program is efficiently and effectively responding to AMWG goals (i.e., management objectives), and
- (7) any other program specific scientific and technical advice it is asked to address by the AMWG, the GCMRC, or the Secretary.

Consistent with these tasks, the Scientific Advisors will be asked not only to evaluate whether the best methods are used " but also to evaluate " whether the best questions are being asked." (NRC 1999) A multidisciplinary set of Scientific Advisors is essential for

adequate consideration of coordination and balance among resource programs, their combined effectiveness in advancing understanding of the Grand Canyon ecosystem, and progress in defining and testing adaptive management experiments.

The Scientific Advisors will provide independent scientific and technical advice to the GCMRC Chief and program managers, the AMWG, and the Secretary when and as needed regarding program specific scientific and technical issues. In addition, they may lead specific scientific and technical review and evaluation tasks, as appropriate.

The Scientific Advisors will not be asked to review, interpret, or otherwise evaluate public policy decisions or assess legal compliance associated with the Glen Canyon Dam Adaptive Management Program and activities of the AMWG, the Technical Work Group (TWG), or individual member agencies and organizations.

## **MEMBERSHIP**

In any one year, the Scientific Advisors will be comprised of 10 - 12 individuals. Individuals will be selected to serve as Scientific Advisors based on their record of publication in the peer-reviewed literature, or other demonstrable scientific achievements or technical competence. Scientific Advisors will be selected for their scientific or technical expertise and not as representatives of a particular agency, organization, or other stakeholder group. Scientific Advisors may be drawn from other agencies, academia, and the private sector. Scientific Advisors will be comprised of qualified individuals not otherwise participating in GCMRC sponsored long-term monitoring and research studies and must recuse themselves from bidding on GCMRC proposals for one-year after their term of service is completed.

Scientific Advisors will be selected on the basis of their technical competence, independence, and demonstrated capability to work in an interdisciplinary environment. Balance among expertise in the following areas will be sought

Adaptive management:

Anthropology / Native American studies

Archaeology

Fisheries

- Ecosystem / Riparian ecology  
 Geomorphology  
 GIS / Remote sensing  
 Hydrology;  
 Aquatic ecology Limnology; and  
 Socio-economics

**Selection Process and Terms.** Scientific Advisors will be sought for a three-year term, renewable for one consecutive three-year term. AMWG members may provide GCMRC with names of individuals who should be considered for appointment as a Scientific Advisor. Initial Scientific Advisors will be appointed for staggered one-, two-, and three-year terms, to ensure continuity in membership. Scientific Advisors will be selected from among nominees based on the evaluation criteria presented below. GCMRC will seek the consultation of the AMWG in selecting individuals to serve as GCMRC Scientific Advisors. The selection process, requiring them to sign the standard GCMRC conflict-of-interest statement and providing them a fixed term that they will serve will assure the independence of the Scientific Advisors

## REPORTING

“Although it must be independent, it must have a mechanism for being responsive to the concerns of people with local knowledge, interest, and concerns. Finally, its reports must be visible and accessible to all. Although the advisory board will not and should not make policy decisions, its scientific advice must be loud and clear enough that it cannot be ignored by accident.” (Upstream: Salmon and Society in the Pacific Northwest.)

The Scientific Advisors will report through an Executive Secretary. The Scientific Advisors will provide technical advice and scientific oversight, upon request, in writing to the AMWG, the GCMRC and/or the Secretary; with copies to the WG

## EVALUATION CRITERIA

Technical competence as demonstrated by their record of scientific achievement in one of the areas of technical expertise being sought.

Ability to work in a committee environment

Demonstrated capability to work in an interdisciplinary setting

Not otherwise participating in the Glen Canyon Dam Adaptive Management Program or GCMRC monitoring and research activities.

## **ESTABLISHMENT, ADMINISTRATION and BUDGET**

GCMRC will establish the Scientific Advisors following consultation with the AMWG. The Scientific Advisors will be required to sign the standard GCMRC conflict-of-interest statement, and other Department of the Interior conflict-of-interest statements, as appropriate. Administrative support (i.e., travel, expenses, report production) for Scientific Advisory activities will be provided for by GCMRC.

Scientific Advisors will be reimbursed for their travel and receive per diem for time spent at meetings or at GCMRC to conduct approved scientific and technical review and advisory activities. In addition, Scientific Advisors will receive a professional fee of \$300 per day for time spent on approved activities. Scientific Advisors will be expected to participate in at least one scientific river trip on the Colorado River to familiarize them with the ecosystem

Operations for the first year of Scientific Advisory activities are estimated at \$50,000 - \$100,000

## **OPERATING PROCEDURES**

An Executive Secretary who will be an employee of, or contractor to the GCMRC will lead the Scientific Advisors to GCMRC. In the first year Dr. Lawrence D. Garrett as a contractor will fill this position to GCMRC. The Executive Secretary and the Scientific Advisors will develop operating procedures with respect to resolving disputes and providing scientific and technical advice to the GCMRC, the AMWG, or the Secretary, as appropriate. The Scientific Advisors will meet at least three times per year or as needed. GCMRC will provide a scientist to serve as an Executive Secretary to support the activities of the Scientific Advisors.

## **FY 2001 TASKS**

Scientific Advisors will be asked to provide timely review of:

- (1) review the Goals, management objectives and information needs to determine their potential, taken together as a suite, for achieving the Glen Canyon Dam Adaptive Management Program's Vision and Mission,
- (2) the structure and responsiveness of RFPs to the management objectives and information needs,
- (3) the FY 2001 and 2002 long-term monitoring plans, especially the parameters to be monitored, the protocols to be used, and the overall sampling strategy,
- (4) GCMRC's remote monitoring technology proposals, and
- (5) GCMRC's budget priorities to ensure that the science program is responding efficiently and effectively to AMWG goals (i.e., management objectives).

**Appendix II: August 2004 Additions to Operating Protocol**

DRAFT



**M3 RESEARCH**

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**TO:** Glen Canyon Adaptive Management Program (GCD AMP)  
Adaptive Management Work Group (AMWG)  
Grand Canyon Monitoring and Research Center (GCMRC)  
Mr. Michael Gabaldon, USDI, Secretary Designee

**FROM:** GCD AMP, Science Advisors (SA); by L.D. Garrett, Executive Secretary

**DATE:** July 6, 2004

**SUBJECT:** A Proposal for an Amendment to the GCD AMP Science Advisor Operating Protocol; and a 24-Month Review Program, October 1, 2004-September 30, 2006

The Science Advisors feel as a group that we can create valuable sets of information in the near and long-term for the GCD AMP and its leadership. Recent reviews and reports on the Long-Term Science and Monitoring Programs, Temperature Control Device Project, Aquatic Food Base Program, Humpback Chub Comprehensive Plan, etc., all attest to our capabilities.

To better serve the GCD AMP, the Science Advisors would like to propose additional operations protocols for our group. We also would like to propose a 24-Month Review Plan.

The Science Advisors Operating Protocol approved by the AMWG and GCMRC in December 2000, lacks protocols that define how the SAs receive their charge (tasks) from the AMWG, and how they are to report to AMWG on completed tasks. In Attachment A we offer a proposed protocol amendment to the Science Advisors Operating Protocol Document, to clarify the above activities.

In addition, the Science Advisors can best serve the GCD AMP and AMWG/GCMRC leadership through an agreement on a 24-month plan for reviews and advisory functions. In 2003, at the SAs request, Dr. Garrett, our Executive Secretary, requested permission from Mike Gabaldon, Secretary's Designee, to present a proposal for a 24-month list of review and advisory activities for AMWG/GCMRC consideration. We submitted an original plan, which has now been revised to start 10/04. The revised 24-Month Plan reflects discussions of review needs with AMWG, TWG and GCMRC members.

The first six months of the plan includes finalizing reviews of the GCMRC Strategic Plan, Core Monitoring Program, Long Term Experimental Plan and Humpback Chub Plan. Twelve months are dedicated to an overall GCD AMP program review. This includes revisions of science process and accomplishment and the adaptive management reviews. Also proactive efforts with GCMRC to establish robust integration in the science and monitoring programs, and improved science protocols are also included.



We wish the AMWG/GCMRC leadership to consider these inputs as proposals for improving our contributions to the GCD AMP. We are especially sensitive to our need to be available for critical reviews in the next 24 months, and would hope to get tentative approval for these reviews in the August AMWG meeting.

We enjoy our professional association with the GCD AMP and its leadership, and look forward to receiving your guidance on review and advisory charges.

ATTACHMENT A: SCIENCE ADVISOR PROTOCOLS

ATTACHMENT B: PROPOSED 24-MONTH SCIENCE ADVISOR REVIEW PLAN

## ATTACHMENT A

### PROPOSED ADDITIONS TO GCD AMP SCIENCE ADVISORS OPERATING PROTOCOL (12/2000)

The Science Advisors were developed to fulfill the requirement for an Independent Review Panel (IRP), as specified in the GCD EIS (US BOR 1995). The Operating Protocols for the GCD AMP Science Advisors, and the initial group of Science Advisors were approved in 2000/2001 by the Adaptive Management Work Group.

The guiding Operating Protocol for the Science Advisors specifies they are needed “for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and the Center (GCMRC) regarding monitoring priorities, integration and management”.

The purpose of the Science Advisors is specified in their Operating Protocols as follows: “The Science Advisors will provide independent scientific oversight and technical advice [to AMWG] to ensure that GCMRC science programs are efficient, unbiased, objective; and scientifically sound”. And, the following seven areas of review are specified in the Operating Protocol for the Advisors:

1. Results of ongoing and completed monitoring and research program activities, as well as any synthesis and assessment objectives initiated by GCMRC,
2. The appropriateness of GCMRC’s RFPs, especially their responsiveness to management objectives,
3. The protocols used in GCMRC sponsored scientific activities, including a 5-year review of GCMRC monitoring and research protocols,
4. GCMRC’s long-term monitoring plan,
5. GCMRC’s annual monitoring and research plans,
6. GCMRC’s annual budget proposals, to ensure that the science program is efficiently and effectively responding to AMWG goals (i.e., management objectives),
7. Any other program, specific scientific and technical advice it is asked to address by the AMWG, the GCMRC, or the Secretary.

The Advisors are not a FACA committee, and are charged to provide independent advice and review comment. Their activities and input are coordinated by an Executive Secretary, who is responsible for facilitating their reviews and documenting all independent reviews, advisory input, etc., in written reports. The Advisors may elect, as deemed necessary, to have this Executive Secretary represent them at AMWG, TWG and GCMRC meetings.

The 2000 Operating Protocols for the Science Advisors, although most effective, do not

explicitly clarify how the Advisors are to receive their list of annual tasks from the AMWG/GCMRC/USDI Secretary's Designee, or report on accomplishments. As such, we propose the following protocol be added to the current Operating Protocol Document at the end of the section "OPERATING PROCEDURES" (page 5).

**“Annually the AMWG will, in its summer meeting, review, update and assign a general set of 24-month review tasks and advisory activities for the Science Advisors. The Chief of the GCMRC, TWG Chair and Executive Secretary of the Science Advisors are responsible for providing all necessary inputs to the Chair of the AMWG by May 1 to permit development of the new Science Advisors charge. The Science Advisors or Executive Secretary are to present each May 15 to the Secretary's Designee, AMWG Chair, GCMRC Chief and TWG Chair a written annual report of accomplishments, including specific documentation of Science Advisor activities. Further, the Advisors, or Executive Secretary, are to report to AMWG in verbal and written reports at each formal AMWG meeting on any review or advisory report completed since the previous AMWG meeting. The Science Advisors and/or the Science Advisors' Executive Secretary will be available at all formal AMWG meetings to respond as needed to requests for information from AMWG, the Secretary Designee or GCMRC”.**

**ATTACHMENT B**  
**PROPOSED GCMRC SCIENCE ADVISOR**  
**24-MONTH REVIEW TASKS**  
**AND SCHEDULE**  
**OCTOBER 2003 – OCTOBER 2005**

| Months      | Task Activity                                                                                                                                                                                                                                                                                            | Meetings                                                                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/04 –1/05 | Complete review of GCMRC Science Programs and budgets. Complete the Core Monitoring Program, Humpback Chub Plan, LTEP and Strategic Plan reviews.                                                                                                                                                        | Meetings of Executive Secretary and Science Advisors with AMWG and GCMRC representatives to report on four reviews. 3-5 day meetings of SAs to finalize reviews; Phoenix and Page, AZ.                                                                            |
| 1/05-7/05   | Develop key science and monitoring questions for program integration assessment.<br>Initiate review of GCMRC's annual research plan and budget.<br>Interact with AMWG/TWG representatives to Conduct overall GCD AMP program review; conduct all interviews and review AMWG/TWG/GCMRC documents.         | Meetings of SAs to develop GCD AMP review; 2 and 5 days, Flagstaff and Page, AZ. Evaluate SA's questions on integration of research management and monitoring,                                                                                                    |
| 7/05-1/06   | SA's develop cooperative one year program with GCMRC to design new approach for research and monitoring integration. Complete review of annual research plan components including budgets, and conduct assessment of program integration. Conclude overall GCD AMP review. Develop draft report to AMWG. | River trip 9/05 [SAs, AMWG, TWG, GCMRC]. Mini workshops on research and monitoring integration and presentations on GCD AMP review. Meeting in Phoenix 1/06 with AMWG representatives to present GCD AMP over all program review and review of GCMRC annual plan. |
| 1/06-4/06   | Develop draft review present on improved integration approaches for GCMRC research and monitoring programs. Workshops of SA's, GCMRC, TWG, and AMWG to enhance science and monitoring integration. Review research and monitoring protocols.                                                             | Page, AZ or Flagstaff; workshop on science and monitoring integration 1/06. Phoenix meeting with scientists/AMWG/ TWG representatives 4/06, to present strategies for research & monitoring approaches to science and monitoring integration.                     |
| 4/06-8/06   | Conduct GCMRC Protocol Review. Initiate reviews of technology transfer,                                                                                                                                                                                                                                  | Science and monitoring protocol workshops;                                                                                                                                                                                                                        |

|            |                                                                                                                                       |                                                                                                                                                                                                                                                                                                         |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | info mgt, GIS, remote sensing, and data analysis programs. Develop final report(s) on program integration.                            | Page/Flagstaff, AZ. SA's GCMRC, AMWG, TWG (6/06). Evaluate technology methods and applications                                                                                                                                                                                                          |
| 8/06-10/06 | Complete review on GCMRC protocols and draft reviews of information management, technology transfer, remote sensing, data collection. | Presentation of final reports on GCMRC program protocols and draft reviews on data management technology transfer and analysis methodologies.<br>10/05 Science River trip; SA; GCMRC, TWG, AMWG, TWG, to present revised methods and protocols, etc. for science and monitoring information management. |

**Appendix III: OMB 2004 Federal Peer Review Guidelines**

DRAFT



**EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503**

THE DIRECTOR

M-05-03

December 16, 2004

**MEMORANDUM FOR HEADS OF DEPARTMENTS AND AGENCIES**

**FROM:**

Joshua B. Bolten  
Director

**SUBJECT:**

Issuance of OMB's "Final Information Quality Bulletin  
for Peer Review"

OMB has today issued a bulletin applicable to all departments and agencies entitled "Final Information Quality Bulletin for Peer Review." This Bulletin establishes government-wide guidance aimed at enhancing the practice of peer review of government science documents. Peer review is an important procedure used by the scientific community to ensure that the quality of published information. Peer review can increase the quality and credibility of the scientific information generated across the federal government. This Bulletin is one aspect of a larger OMB effort to improve the quality of the scientific information upon which policy decisions are based.

The bulletin has benefited from extensive public and agency comments received on two prior draft versions, which were released by OMB in September 15, 2003 and April 28, 2004. The bulletin includes guidance to federal agencies on what information is subject to peer review, the selection of appropriate peer reviewers, opportunities for public participation, and related issues. The bulletin also defines a peer review planning process that will permit the public and scientific societies to contribute to agency dialogue about which scientific reports merit especially rigorous peer review.

If your staff has questions about this guidance, please contact Margo Schwab at (202) 395-5647 or [mschwab@omb.eop.gov](mailto:mschwab@omb.eop.gov).

Attachments

# **OFFICE OF MANAGEMENT AND BUDGET**

## **Final Information Quality Bulletin for Peer Review**

### INTRODUCTION

This Bulletin establishes that important scientific information shall be peer reviewed by qualified specialists before it is disseminated by the federal government. We published a proposed Bulletin on September 15, 2003. Based on public comments, we published a revised proposal for additional comment on April 28, 2004. We are now finalizing the April version, with minor revisions responsive to the public's comments.

The purpose of the Bulletin is to enhance the quality and credibility of the government's scientific information. We recognize that different types of peer review are appropriate for different types of information. Under this Bulletin, agencies are granted broad discretion to weigh the benefits and costs of using a particular peer review mechanism for a specific information product. The selection of an appropriate peer review mechanism for scientific information is left to the agency's discretion. Various types of information are exempted from the requirements of this Bulletin, including time-sensitive health and safety determinations, in order to ensure that peer review does not unduly delay the release of urgent findings.

This Bulletin also applies stricter minimum requirements for the peer review of highly influential scientific assessments, which are a subset of influential scientific information. A scientific assessment is an evaluation of a body of scientific or technical knowledge that typically synthesizes multiple factual inputs, data, models, assumptions, and/or applies best professional judgment to bridge uncertainties in the available information. To ensure that the Bulletin is not too costly or rigid, these requirements for more intensive peer review apply only to the more important scientific assessments disseminated by the federal government.

Even for these highly influential scientific assessments, the Bulletin leaves significant discretion to the agency formulating the peer review plan. In general, an agency conducting a peer review of a highly influential scientific assessment must ensure that the peer review process is transparent by making available to the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' report(s), and the agency's response to the peer reviewers' report(s). The agency selecting peer reviewers must ensure that the reviewers possess the necessary expertise. In addition, the agency must address reviewers' potential conflicts of interest (including those stemming from ties to regulated businesses and other stakeholders) and independence from the agency. This Bulletin requires agencies to adopt or adapt the committee selection policies employed by the National Academy of Sciences (NAS)<sup>1</sup> when selecting peer reviewers who are not government employees. Those that are government employees are subject to federal ethics requirements. The use of a transparent process, coupled with the selection of qualified and independent peer reviewers, should improve the quality of government science while promoting public confidence in the integrity of the government's scientific products.

## PEER REVIEW

Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. It is a form of deliberation involving an exchange of judgments about the appropriateness of methods and the strength of the author's inferences.<sup>2</sup> Peer review involves the review of a draft product for quality by specialists in the field who were not involved in producing the draft.

The peer reviewer's report is an evaluation or critique that is used by the authors of the draft to improve the product. Peer review typically evaluates the clarity of hypotheses,

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<sup>1</sup> National Academy of Sciences, "Policy and Procedures on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports," May 2003: Available at: <http://www.nationalacademies.org/coi/index.html>.

the validity of the research design, the quality of data collection procedures, the robustness of the methods employed, the appropriateness of the methods for the hypotheses being tested, the extent to which the conclusions follow from the analysis, and the strengths and limitations of the overall product.

Peer review has diverse purposes. Editors of scientific journals use reviewer comments to help determine whether a draft scientific article is of sufficient quality, importance, and interest to a field of study to justify publication. Research funding organizations often use peer review to evaluate research proposals. In addition, some federal agencies make use of peer review to obtain evaluations of draft information that contains important scientific determinations.

Peer review should not be confused with public comment and other stakeholder processes. The selection of participants in a peer review is based on expertise, with due consideration of independence and conflict of interest. Furthermore, notice-and-comment procedures for agency rulemaking do not provide an adequate substitute for peer review, as some experts -- especially those most knowledgeable in a field -- may not file public comments with federal agencies.

The critique provided by a peer review often suggests ways to clarify assumptions, findings, and conclusions. For instance, peer reviews can filter out biases and identify oversights, omissions, and inconsistencies.<sup>3</sup> Peer review also may encourage authors to more fully acknowledge limitations and uncertainties. In some cases, reviewers might recommend major changes to the draft, such as refinement of hypotheses, reconsideration of research design, modifications of data collection or analysis methods, or alternative conclusions. However, peer review does not always lead to specific modifications in the draft product. In some cases, a draft is in excellent shape prior to being submitted for

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<sup>2</sup> Carnegie Commission on Science, Technology, and Government, Risk and the Environment: Improving Regulatory Decision Making, Carnegie Commission, New York, 1993: 75.

<sup>3</sup> William W. Lowrance, Modern Science and Human Values, Oxford University Press, New York, NY 1985: 85.

review. In others, the authors do not concur with changes suggested by one or more reviewers.

Peer review may take a variety of forms, depending upon the nature and importance of the product. For example, the reviewers may represent one scientific discipline or a variety of disciplines; the number of reviewers may range from a few to more than a dozen; the names of each reviewer may be disclosed publicly or may remain anonymous (e.g., to encourage candor); the reviewers may be blinded to the authors of the report or the names of the authors may be disclosed to the reviewers; the reviewers may prepare individual reports or a panel of reviewers may be constituted to produce a collaborative report; panels may do their work electronically or they may meet together in person to discuss and prepare their evaluations; and reviewers may be compensated for their work or they may donate their time as a contribution to science or public service.

For large, complex reports, different reviewers may be assigned to different chapters or topics. Such reports may be reviewed in stages, sometimes with confidential reviews that precede a public process of panel review. As part of government-sponsored peer review, there may be opportunity for written and/or oral public comments on the draft product.

The results of peer review are often only one of the criteria used to make decisions about journal publication, grant funding, and information dissemination. For instance, the editors of scientific journals (rather than the peer reviewers) make final decisions about a manuscript's appropriateness for publication based on a variety of considerations. In research-funding decisions, the reports of peer reviewers often play an important role, but the final decisions about funding are often made by accountable officials based on a variety of considerations. Similarly, when a government agency sponsors peer review of its own draft documents, the peer review reports are an important factor in information dissemination decisions but rarely are the sole consideration. Agencies are not expected to cede their discretion with regard to dissemination or use of information to peer reviewers; accountable agency officials must make the final decisions.

## THE NEED FOR STRONGER PEER REVIEW POLICIES

There are a multiplicity of science advisory procedures used at federal agencies and across the wide variety of scientific products prepared by agencies.<sup>4</sup> In response to congressional inquiry, the U.S. General Accounting Office (now the Government Accountability Office) documented the variability in both the definition and implementation of peer review across agencies.<sup>5</sup> The Carnegie Commission on Science, Technology and Government<sup>6</sup> has highlighted the importance of “internal” scientific advice (within the agency) and “external” advice (through scientific advisory boards and other mechanisms).

A wide variety of authorities have argued that peer review practices at federal agencies need to be strengthened.<sup>7</sup> Some arguments focus on specific types of scientific products (e.g., assessments of health, safety and environmental hazards).<sup>8</sup> The Congressional/Presidential Commission on Risk Assessment and Risk Management suggests that “peer review of economic and social science information should have as high a priority as peer review of health, ecological, and engineering information.”<sup>9</sup>

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<sup>4</sup> Sheila Jasanoff, The Fifth Branch: Science Advisors as Policy Makers, Harvard University Press, Boston, 1990.

<sup>5</sup> U.S. General Accounting Office, Federal Research: Peer Review Practices at Federal Agencies Vary, GAO/RCED-99-99, Washington, D.C., 1999.

<sup>6</sup> Carnegie Commission on Science, Technology, and Government, Risk and the Environment: Improving Regulatory Decision Making, Carnegie Commission, New York, 1993: 90.

<sup>7</sup> National Academy of Sciences, Peer Review in the Department of Energy – Office of Science and Technology, Interim Report, National Academy Press, Washington, D.C., 1997; National Academy of Sciences, Peer Review in Environmental Technology Development: The Department of Energy – Office of Science and Technology, National Academy Press, Washington, D.C., 1998; National Academy of Sciences, Strengthening Science at the U.S. Environmental Protection Agency: Research-Management and Peer-Review Practices, National Academy Press, Washington, D.C. 2000; U.S. General Accounting Office, EPA’s Science Advisory Board Panels: Improved Policies and Procedures Needed to Ensure Independence and Balance, GAO-01-536, Washington, D.C., 2001; U. S. Environmental Protection Agency, Office of Inspector General, Pilot Study: Science in Support of Rulemaking 2003-P-00003, Washington, D.C., 2002; Carnegie Commission on Science, Technology, and Government, In the National Interest: The Federal Government in the Reform of K-12 Math and Science Education, Carnegie Commission, New York, 1991; U.S. General Accounting Office, Endangered Species Program: Information on How Funds Are Allocated and What Activities are Emphasized, GAO-02-581, Washington, D.C. 2002.

<sup>8</sup> National Research Council, Science and Judgment in Risk Assessment, National Academy Press, Washington, D.C., 1994.

Some agencies have formal peer review policies, while others do not. Even agencies that have such policies do not always follow them prior to the release of important scientific products.

Prior to the development of this Bulletin, there were no government-wide standards concerning when peer review is required and, if required, what type of peer review processes are appropriate. No formal interagency mechanism existed to foster cross-agency sharing of experiences with peer review practices and policies. Despite the importance of peer review for the credibility of agency scientific products, the public lacked a consistent way to determine when an important scientific information product is being developed by an agency, the type of peer review planned for that product, or whether there would be an opportunity to provide comments and data to the reviewers.

This Bulletin establishes minimum standards for when peer review is required for scientific information and the types of peer review that should be considered by agencies in different circumstances. It also establishes a transparent process for public disclosure of peer review planning, including a web-accessible description of the peer review plan that the agency has developed for each of its forthcoming influential scientific disseminations.

#### LEGAL AUTHORITY FOR THE BULLETIN

This Bulletin is issued under the Information Quality Act and OMB's general authorities to oversee the quality of agency information, analyses, and regulatory actions. In the Information Quality Act, Congress directed OMB to issue guidelines to "provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility and integrity of information" disseminated by Federal agencies. Pub. L. No. 106-554, § 515(a). The Information Quality Act was developed as a supplement to the Paperwork Reduction Act, 44 U.S.C. § 3501 *et seq.*, which requires OMB, among

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<sup>9</sup> Presidential/Congressional Commission on Risk Assessment and Risk Management, Risk Commission Report, Volume 2, Risk Assessment and Risk Management in Regulatory Decision-Making, 1997:103.

other things, to “develop and oversee the implementation of policies, principles, standards, and guidelines to . . . apply to Federal agency dissemination of public information.” In addition, Executive Order 12866, 58 Fed. Reg. 51,735 (Oct. 4, 1993), establishes that OIRA is “the repository of expertise concerning regulatory issues,” and it directs OMB to provide guidance to the agencies on regulatory planning. E.O. 12866, § 2(b). The Order also requires that “[e]ach agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, or other information.” E.O. 12866, § 1(b)(7). Finally, OMB has authority in certain circumstances to manage the agencies under the purview of the President’s Constitutional authority to supervise the unitary Executive Branch. All of these authorities support this Bulletin.

#### THE REQUIREMENTS OF THIS BULLETIN

This Bulletin addresses peer review of scientific information disseminations that contain findings or conclusions that represent the official position of one or more agencies of the federal government.

#### Section I: Definitions

Section I provides definitions that are central to this Bulletin. Several terms are identical to or based on those used in OMB’s government-wide information quality guidelines, 67 Fed. Reg. 8452 (Feb. 22, 2002), and the Paperwork Reduction Act, 44 U.S.C. § 3501 et seq.

The term “Administrator” means the Administrator of the Office of Information and Regulatory Affairs in the Office of Management and Budget (OIRA).

The term “agency” has the same meaning as in the Paperwork Reduction Act, 44 U.S.C. § 3502(1).

The term “Information Quality Act” means Section 515 of Public Law 106-554 (Pub. L. No. 106-554, § 515, 114 Stat. 2763, 2763A-153-154 (2000)).

The term “dissemination” means agency initiated or sponsored distribution of information to the public. Dissemination does not include distribution limited to government employees or agency contractors or grantees; intra- or inter-agency use or sharing of government information; or responses to requests for agency records under the Freedom of Information Act, the Privacy Act, the Federal Advisory Committee Act, the Government Performance and Results Act, or similar laws. This definition also excludes distribution limited to correspondence with individuals or persons, press releases, archival records, public filings, subpoenas and adjudicative processes. In the context of this Bulletin, the definition of “dissemination” modifies the definition in OMB’s government-wide information quality guidelines to address the need for peer review prior to official dissemination of the information product. Accordingly, under this Bulletin, “dissemination” also excludes information distributed for peer review in compliance with this Bulletin or shared confidentially with scientific colleagues, provided that the distributing agency includes an appropriate and clear disclaimer on the information, as explained more fully below. Finally, the Bulletin does not directly cover information supplied to the government by third parties (e.g., studies by private consultants, companies and private, non-profit organizations, or research institutions such as universities). However, if an agency plans to disseminate information supplied by a third party (e.g., using this information as the basis for an agency’s factual determination that a particular behavior causes a disease), the requirements of the Bulletin apply, if the dissemination is “influential”.

In cases where a draft report or other information is released by an agency solely for purposes of peer review, a question may arise as to whether the draft report constitutes an official “dissemination” under information-quality guidelines. Section I instructs agencies to make this clear by presenting the following disclaimer in the report:

“THIS INFORMATION IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PRE-DISSEMINATION PEER REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY [THE AGENCY]. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.”

In cases where the information is highly relevant to specific policy or regulatory deliberations, this disclaimer shall appear on each page of a draft report. Agencies also shall discourage state, local, international and private organizations from using information in draft reports that are undergoing peer review. Draft influential scientific information presented at scientific meetings or shared confidentially with colleagues for scientific input prior to peer review shall include the disclaimer: “THE FINDINGS AND CONCLUSIONS IN THIS REPORT (PRESENTATION) HAVE NOT BEEN FORMALLY DISSEMINATED BY [THE AGENCY] AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.”

An information product is not covered by the Bulletin unless it represents an official view of one or more departments or agencies of the federal government. Accordingly, for the purposes of this Bulletin, “dissemination” excludes research produced by government-funded scientists (e.g., those supported extramurally or intramurally by federal agencies or those working in state or local governments with federal support) if that information is not represented as the views of a department or agency (i.e., they are not official government disseminations). For influential scientific information that does not have the imprimatur of the federal government, scientists employed by the federal government are required to include in their information product a clear disclaimer that “the findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the funding agency.” A similar disclaimer is advised for non-government employees who publish government-funded research.

For the purposes of the peer review Bulletin, the term “scientific information” means factual inputs, data, models, analyses, technical information, or scientific assessments

related to such disciplines as the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences. This includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. This definition includes information that an agency disseminates from a web page, but does not include the provision of hyperlinks on a web page to information that others disseminate. This definition excludes opinions, where the agency's presentation makes clear that an individual's opinion, rather than a statement of fact or of the agency's findings and conclusions, is being offered.

The term "influential scientific information" means scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions. In the term "influential scientific information," the term "influential" should be interpreted consistently with OMB's government-wide information quality guidelines and the information quality guidelines of the agency. Information dissemination can have a significant economic impact even if it is not part of a rulemaking. For instance, the economic viability of a technology can be influenced by the government's characterization of its attributes. Alternatively, the federal government's assessment of risk can directly or indirectly influence the response actions of state and local agencies or international bodies.

One type of scientific information is a scientific assessment. For the purposes of this Bulletin, the term "scientific assessment" means an evaluation of a body of scientific or technical knowledge, which typically synthesizes multiple factual inputs, data, models, assumptions, and/or applies best professional judgment to bridge uncertainties in the available information. These assessments include, but are not limited to, state-of-science reports; technology assessments; weight-of-evidence analyses; meta-analyses; health, safety, or ecological risk assessments; toxicological characterizations of substances; integrated assessment models; hazard determinations; or exposure assessments. Such assessments often draw upon knowledge from multiple disciplines. Typically, the data and models used in scientific assessments have already been subject to some form of peer

review (e.g., refereed journal peer review or peer review under Section II of this Bulletin).

## Section II: Peer Review of Influential Scientific Information

Section II requires each agency to subject "influential" scientific information to peer review prior to dissemination. For dissemination of influential scientific information, Section II provides agencies broad discretion in determining what type of peer review is appropriate and what procedures should be employed to select appropriate reviewers. Agencies are directed to choose a peer review mechanism that is adequate, giving due consideration to the novelty and complexity of the science to be reviewed, the relevance of the information to decision making, the extent of prior peer reviews, and the expected benefits and costs of additional review.

The National Academy of Public Administration suggests that the intensity of peer review should be commensurate with the significance of the information being disseminated and the likely implications for policy decisions.<sup>10</sup> Furthermore, agencies need to consider tradeoffs between depth of peer review and timeliness.<sup>11</sup> More rigorous peer review is necessary for information that is based on novel methods or presents complex challenges for interpretation. Furthermore, the need for rigorous peer review is greater when the information contains precedent-setting methods or models, presents conclusions that are likely to change prevailing practices, or is likely to affect policy decisions that have a significant impact.

This tradeoff can be considered in a benefit-cost framework. The costs of peer review include both the direct costs of the peer review activity and those stemming from potential delay in government and private actions that can result from peer review. The benefits of peer review are equally clear: the insights offered by peer reviewers may lead

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<sup>10</sup> National Academy of Public Administration, *Setting Priorities, Getting Results: A New Direction for EPA*, National Academy Press, Washington, D.C., 1995:23.

<sup>11</sup> Presidential/Congressional Commission on Risk Assessment and Risk Management, *Risk Commission Report*, 1997.

to policy with more benefits and/or fewer costs. In addition to contributing to strong science, peer review, if performed fairly and rigorously, can build consensus among stakeholders and reduce the temptation for courts and legislators to second-guess or overturn agency actions.<sup>12</sup> While it will not always be easy for agencies to quantify the benefits and costs of peer review, agencies are encouraged to approach peer review from a benefit-cost perspective.

Regardless of the peer review mechanism chosen, agencies should strive to ensure that their peer review practices are characterized by both scientific integrity and process integrity. “Scientific integrity,” in the context of peer review, refers to such issues as “expertise and balance of the panel members; the identification of the scientific issues and clarity of the charge to the panel; the quality, focus and depth of the discussion of the issues by the panel; the rationale and supportability of the panel’s findings; and the accuracy and clarity of the panel report.” “Process integrity” includes such issues as “transparency and openness, avoidance of real or perceived conflicts of interest, a workable process for public comment and involvement,” and adherence to defined procedures.<sup>13</sup>

When deciding what type of peer review mechanism is appropriate for a specific information product, agencies will need to consider at least the following issues: individual versus panel review; timing; scope of the review; selection of reviewers; disclosure and attribution; public participation; disposition of reviewer comments; and adequacy of prior peer review.

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<sup>12</sup> Mark R. Powell, Science at EPA: Information in the Regulatory Process, Resources for the Future, Washington, D.C., 1999: 148, 176; Sheila Jasanoff, The Fifth Branch: Science Advisors as Policy Makers, Harvard University Press, Boston, 1990: 242.

<sup>13</sup> ILSI Risk Sciences Institute, “Policies and Procedures: Model Peer Review Center of Excellence,” 2002: 4. Available at <http://rsi.ilsa.org/file/Policies&Procedures.pdf>.

### *Individual versus Panel Review*

Letter reviews by several experts generally will be more expeditious than convening a panel of experts. Individual letter reviews are more appropriate when a draft document covers only one discipline or when premature disclosure of a sensitive report to a public panel could cause harm to government or private interests. When time and resources warrant, panels are preferable, as they tend to be more deliberative than individual letter reviews and the reviewers can learn from each other. There are also multi-stage processes in which confidential letter reviews are conducted prior to release of a draft document for public notice and comment, followed by a formal panel review. These more rigorous and expensive processes are particularly valuable for highly complex, multidisciplinary, and more important documents, especially those that are novel or precedent-setting.

### *Timing of Peer Review*

As a general rule, it is most useful to consult with peers early in the process of producing information. For example, in the context of risk assessments, it is valuable to have the choice of input data and the specification of the model reviewed by peers before the agency invests time and resources in implementing the model and interpreting the results. "Early" peer review occurs in time to "focus attention on data inadequacies in time for corrections.

When an information product is a critical component of rule-making, it is important to obtain peer review before the agency announces its regulatory options so that any technical corrections can be made before the agency becomes invested in a specific approach or the positions of interest groups have hardened. If review occurs too late, it is unlikely to contribute to the course of a rulemaking. Furthermore, investing in a more rigorous peer review early in the process "may provide net benefit by reducing the

prospect of challenges to a regulation that later may trigger time consuming and resource-draining litigation.”<sup>14</sup>

### *Scope of the Review*

The “charge” contains the instructions to the peer reviewers regarding the objective of the peer review and the specific advice sought. The importance of the information, which shapes the goal of the peer review, influences the charge. For instance, the goal of the review might be to determine the utility of a body of literature for drawing certain conclusions about the feasibility of a technology or the safety of a product. In this context, an agency might ask reviewers to determine the relevance of conclusions drawn in one context for other contexts (e.g., different exposure conditions or patient populations).

The charge to the reviewers should be determined in advance of the selection of the reviewers. In drafting the charge, it is important to remember the strengths and limitations of peer review. Peer review is most powerful when the charge is specific and steers the reviewers to specific technical questions while also directing reviewers to offer a broad evaluation of the overall product.

Uncertainty is inherent in science, and in many cases individual studies do not produce conclusive evidence. Thus, when an agency generates a scientific assessment, it is presenting its scientific judgment about the accumulated evidence rather than scientific fact.<sup>15</sup> Specialists attempt to reach a consensus by weighing the accumulated evidence. Peer reviewers can make an important contribution by distinguishing scientific facts from professional judgments. Furthermore, where appropriate, reviewers should be asked to provide advice on the reasonableness of judgments made from the scientific evidence.

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<sup>14</sup> Fred Anderson, Mary Ann Chirba Martin, E Donald Elliott, Cynthia Farina, Ernest Gellhorn, John D. Graham, C. Boyden Gray, Jeffrey Holmstead, Ronald M. Levin, Lars Noah, Katherine Rhyne, Jonathan Baert Wiener, "Regulatory Improvement Legislation: Risk Assessment, Cost-Benefit Analysis, and Judicial Review," *Duke Environmental Law and Policy Forum*, Fall 2000, vol. XI (1): 132.

<sup>15</sup> Mark R. Powell, *Science at EPA: Information in the Regulatory Process*, Resources for the Future, Washington, D.C., 1999: 139.

However, the charge should make clear that the reviewers are not to provide advice on the policy (e.g., the amount of uncertainty that is acceptable or the amount of precaution that should be embedded in an analysis). Such considerations are the purview of the government.<sup>16</sup>

The charge should ask that peer reviewers ensure that scientific uncertainties are clearly identified and characterized. Since not all uncertainties have an equal effect on the conclusions drawn, reviewers should be asked to ensure that the potential implications of the uncertainties for the technical conclusions drawn are clear. In addition, peer reviewers might be asked to consider value-of-information analyses that identify whether more research is likely to decrease key uncertainties.<sup>17</sup> Value-of-information analysis was suggested for this purpose in the report of the Presidential/Congressional Commission on Risk Assessment and Risk Management.<sup>18</sup> A description of additional research that would appreciably influence the conclusions of the assessment can help an agency assess and target subsequent efforts.

### *Selection of Reviewers*

Expertise. The most important factor in selecting reviewers is expertise: ensuring that the selected reviewer has the knowledge, experience, and skills necessary to perform the review. Agencies shall ensure that, in cases where the document being reviewed spans a variety of scientific disciplines or areas of technical expertise, reviewers who represent the necessary spectrum of knowledge are chosen. For instance, expertise in applied mathematics and statistics is essential in the review of models, thereby allowing an audit of calculations and claims of significance and robustness based on the numeric data.<sup>19</sup>

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<sup>16</sup> Ibid.

<sup>17</sup> Granger Morgan and Max Henrion, "The Value of Knowing How Little You Know," Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis, Cambridge University Press, 1990: 307.

<sup>18</sup> Presidential/Congressional Commission on Risk Assessment and Risk Management, Risk Commission Report, 1997, Volume 1: 39, Volume 2: 91.

<sup>19</sup> William W. Lowrance, Modern Science and Human Values, Oxford University Press, New York, NY 1985: 86.

For some reviews, evaluation of biological plausibility is as important as statistical modeling. Agencies shall consider requesting that the public, including scientific and professional societies, nominate potential reviewers.

Balance. While expertise is the primary consideration, reviewers should also be selected to represent a diversity of scientific perspectives relevant to the subject. On most controversial issues, there exists a range of respected scientific viewpoints regarding interpretation of the available literature. Inviting reviewers with competing views on the science may lead to a sharper, more focused peer review. Indeed, as a final layer of review, some organizations (e.g., the National Academy of Sciences) specifically recruit reviewers with strong opinions to test the scientific strength and balance of their reports. The NAS policy on committee composition and balance<sup>20</sup> highlights important considerations associated with perspective, bias, and objectivity.

Independence. In its narrowest sense, independence in a reviewer means that the reviewer was not involved in producing the draft document to be reviewed. However, for peer review of some documents, a broader view of independence is necessary to assure credibility of the process. Reviewers are generally not employed by the agency or office producing the document. As the National Academy of Sciences has stated, “external experts often can be more open, frank, and challenging to the status quo than internal reviewers, who may feel constrained by organizational concerns.”<sup>21</sup> The Carnegie Commission on Science, Technology, and Government notes that “external science advisory boards serve a critically important function in providing regulatory agencies with expert advice on a range of issues.”<sup>22</sup> However, the choice of reviewers requires a case-by-case analysis. Reviewers employed by other federal and state agencies may possess unique or indispensable expertise.

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<sup>20</sup> National Academy of Sciences, “Policy and Procedures on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports,” May 2003: Available at: <http://www.nationalacademies.org/coi/index.html>.

<sup>21</sup> National Research Council, Peer Review in Environmental Technology Development Programs: The Department of Energy’s Office of Science and Technology, National Academy Press, Washington, D.C., 1998: 3.

<sup>22</sup> Carnegie Commission on Science, Technology, and Government, Risk and the Environment: Improving Regulatory Decision Making, Carnegie Commission, New York, 1993: 90.

A related issue is whether government-funded scientists in universities and consulting firms have sufficient independence from the federal agencies that support their work to be appropriate peer reviewers for those agencies.<sup>23</sup> This concern can be mitigated in situations where the scientist initiates the hypothesis to be tested or the method to be developed, which effectively creates a buffer between the scientist and the agency. When an agency awards grants through a competitive process that includes peer review, the agency's potential to influence the scientist's research is limited. As such, when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects.

As the foregoing suggests, independence poses a complex set of questions that must be considered by agencies when peer reviewers are selected. In general, agencies shall make an effort to rotate peer review responsibilities across the available pool of qualified reviewers, recognizing that in some cases repeated service by the same reviewer is needed because of essential expertise.

Some agencies have built entire organizations to provide independent scientific advice while other agencies tend to employ ad hoc scientific panels on specific issues. Respect for the independence of reviewers may be enhanced if an agency collects names of potential reviewers (based on considerations of expertise and reputation for objectivity)

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<sup>23</sup> Lars Noah, "Scientific 'Republicanism': Expert Peer Review and the Quest for Regulatory Deliberation," Emory Law Journal, Atlanta, Fall 2000:1066.

from the public, including scientific or professional societies. The Department of Energy's use of the American Society of Mechanical Engineers to identify potential peer reviewers from a variety of different scientific societies provides an example of how professional societies can assist in the development of an independent peer review panel.<sup>24</sup>

Conflict of Interest. The National Academy of Sciences defines "conflict of interest" as any financial or other interest that conflicts with the service of an individual on the review panel because it could impair the individual's objectivity or could create an unfair competitive advantage for a person or organization.<sup>25</sup> This standard provides a useful benchmark for agencies to consider in selecting peer reviewers. Agencies shall make a special effort to examine prospective reviewers' potential financial conflicts, including significant investments, consulting arrangements, employer affiliations and grants/contracts. Financial ties of potential reviewers to regulated entities (e.g., businesses), other stakeholders, and regulatory agencies shall be scrutinized when the information being reviewed is likely to be relevant to regulatory policy. The inquiry into potential conflicts goes beyond financial investments and business relationships and includes work as an expert witness, consulting arrangements, honoraria and sources of grants and contracts. To evaluate any real or perceived conflicts of interest with potential reviewers and questions regarding the independence of reviewers, agencies are referred to federal ethics requirements, applicable standards issued by the Office of Government Ethics, and the prevailing practices of the National Academy of Sciences. Specifically, peer reviewers who are federal employees (including special government employees) are subject to federal requirements governing conflicts of interest. See, e.g., 18 U.S.C. § 208; 5 C.F.R. Part 2635 (2004). With respect to reviewers who are not federal employees, agencies shall adopt or adapt the NAS policy for committee selection with respect to

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<sup>24</sup> American Society for Mechanical Engineers, Assessment of Technologies Supported by the Office of Science and Technology, Department of Energy: Results of the Peer Review for Fiscal Year 2002, ASME Technical Publishing, Danvers, MA, 2003.

<sup>25</sup> National Academy of Sciences, "Policy and Procedures on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports," May 2003: Available at: <http://www.nationalacademies.org/coi/index.html>.

evaluating conflicts of interest.<sup>26</sup> Both the NAS and the federal government recognize that under certain circumstances some conflict may be unavoidable in order to obtain the necessary expertise. See, e.g., 18 U.S.C. § 208(b)(3); 5 U.S.C. App. § 15 (governing NAS committees). To improve the transparency of the process, when an agency determines that it is necessary to use a reviewer with a real or perceived conflict of interest, the agency should consider publicly disclosing those conflicts. In such situations, the agency shall inform potential reviewers of such disclosure at the time they are recruited.

*Disclosure and Attribution: Anonymous versus Identified*

Peer reviewers must have a clear understanding of how their comments will be conveyed to the authors of the document and to the public. When peer review of government reports is considered, the case for transparency is stronger, particularly when the report addresses an issue with significant ramifications for the public and private sectors. The public may not have confidence in the peer review process when the names and affiliations of the peer reviewers are unknown. Without access to the comments of reviewers, the public is incapable of determining whether the government has seriously considered the comments of reviewers and made appropriate revisions. Disclosure of the slate of reviewers and the substance of their comments can strengthen public confidence in the peer review process. It is common at many journals and research funding agencies to disclose annually the slate of reviewers. Moreover, the National Academy of Sciences now discloses the names of its peer reviewers, without disclosing the substance of their comments. The science advisory committees to regulatory agencies typically disclose at least a summary of the comments of reviewers as well as their names and affiliations.

For agency-sponsored peer review conducted under Sections II and III, this Bulletin strikes a compromise by requiring disclosure of the identity of the reviewers, but not public attribution of specific comments to specific reviewers. The agency has considerable discretion in the implementation of this compromise (e.g., summarizing the

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<sup>26</sup> Ibid.

views of reviewers as a group or disclosing individual reviewer comments without attribution). Whatever approach is employed, the agency must inform reviewers in advance of how it intends to address this issue. Information about a reviewer retrieved from a record filed by the reviewer's name or other identifier may be disclosed only as permitted by the conditions of disclosure enumerated in the Privacy Act, 5 U.S.C. § 552a as amended, and as interpreted in OMB implementing guidance, 40 Fed. Reg. 28,948 (July 9, 1975).

### *Public Participation*

Public comments can be important in shaping expert deliberations. Agencies may decide that peer review should precede an opportunity for public comment to ensure that the public receives the most scientifically strong product (rather than one that may change substantially as a result of peer reviewer suggestions). However, there are situations in which public participation in peer review is an important aspect of obtaining a high-quality product through a credible process. Agencies, however, should avoid open-ended comment periods, which may delay completion of peer reviews and complicate the completion of the final work product.

Public participation can take a variety of forms, including opportunities to provide oral comments before a peer review panel or requests to provide written comments to the peer reviewers. Another option is for agencies to publish a “request for comment” or other notice in which they solicit public comment before a panel of peer reviewers performs its work.

### *Disposition of Reviewer Comments*

A peer review is considered completed once the agency considers and addresses the reviewers' comments. All reviewer comments should be given consideration and be incorporated where relevant and valid. For instance, in the context of risk assessments, the National Academy of Sciences recommends that peer review include a written

evaluation made available for public inspection.<sup>27</sup> In cases where there is a public panel, the agency should plan publication of the peer review report(s) and the agency's response to peer reviewer comments.

In addition, the credibility of the final scientific report is likely to be enhanced if the public understands how the agency addressed the specific concerns raised by the peer reviewers. Accordingly, agencies should consider preparing a written response to the peer review report explaining: the agency's agreement or disagreement, the actions the agency has undertaken or will undertake in response to the report, and (if applicable) the reasons the agency believes those actions satisfy any key concerns or recommendations in the report.

#### *Adequacy of Prior Peer Review*

In light of the broad range of information covered by Section II, agencies are directed to choose a peer review mechanism that is adequate, giving due consideration to the novelty and complexity of the science to be reviewed, the relevance of the information to decision making, the extent of prior peer reviews, and the expected benefits and costs of additional review.

Publication in a refereed scientific journal may mean that adequate peer review has been performed. However, the intensity of peer review is highly variable across journals. There will be cases in which an agency determines that a more rigorous or transparent review process is necessary. For instance, an agency may determine a particular journal review process did not address questions (e.g., the extent of uncertainty inherent in a finding) that the agency determines should be addressed before disseminating that information. As such, prior peer review and publication is not by itself sufficient grounds for determining that no further review is necessary.

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<sup>27</sup> National Research Council, Risk Assessment in the Federal Government: Managing the Process, National Academy Press, Washington, D.C., 1983.

### Section III: Peer Review of Highly Influential Scientific Assessments

Whereas Section II leaves most of the considerations regarding the form of the peer review to the agency's discretion, Section III requires a more rigorous form of peer review for highly influential scientific assessments. The requirements of Section II of this Bulletin apply to Section III, but Section III has some additional requirements, which are discussed below. In planning a peer review under Section III, agencies typically will have to devote greater resources and attention to the issues discussed in Section II, i.e., individual versus panel review; timing; scope of the review; selection of reviewers; disclosure and attribution; public participation; and disposition of reviewer comments.

A scientific assessment is considered "highly influential" if the agency or the OIRA Administrator determines that the dissemination could have a potential impact of more than \$500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest. One of the ways information can exert economic impact is through the costs or benefits of a regulation based on the disseminated information. The qualitative aspect of this definition may be most useful in cases where it is difficult for an agency to predict the potential economic effect of dissemination. In the context of this Bulletin, it may be either the approach used in the assessment or the interpretation of the information itself that is novel or precedent-setting. Peer review can be valuable in establishing the bounds of the scientific debate when methods or interpretations are a source of controversy among interested parties. If information is covered by Section III, an agency is required to adhere to the peer review procedures specified in Section III.

Section III (2) clarifies that the principal findings, conclusions and recommendations in official reports of the National Academy of Sciences that fall under this Section are generally presumed not to require additional peer review. All other highly influential scientific assessments require a review that meets the requirements of Section III of this Bulletin.

With regard to the selection of reviewers, Section III(3)(a) emphasizes consideration of expertise and balance. As discussed in Section II, expertise refers to the required knowledge, experience and skills required to perform the review whereas balance refers to the need for diversity in scientific perspective and disciplines. We emphasize that the term "balance" here refers not to balancing of stakeholder or political interests but rather to a broad and diverse representation of respected perspectives and intellectual traditions within the scientific community, as discussed in the NAS policy on committee composition and balance.<sup>28</sup>

Section III(3)(b) instructs agencies to consider barring participation by scientists with a conflict of interest. The conflict of interest standards for Sections II and III of the Bulletin are identical. As discussed under Section II, those peer reviewers who are federal employees, including Special Government Employees, are subject to applicable statutory and regulatory standards for federal employees. For non-government employees, agencies shall adopt or adapt the NAS policy for committee member selection with respect to evaluating conflicts of interest.

Section III(3)(c) instructs agencies to ensure that reviewers are independent of the agency sponsoring the review. Scientists employed by the sponsoring agency are not permitted to serve as reviewers for highly influential scientific assessments. This does not preclude Special Government Employees, such as academics appointed to advisory committees, from serving as peer reviewers. The only exception to this ban would be the rare situation in which a scientist from a different agency of a Cabinet-level department than the agency that is disseminating the scientific assessment has expertise, experience and skills that are essential but cannot be obtained elsewhere. In evaluating the need for this exception, agencies shall use the NAS criteria for assessing the appropriateness of using employees of sponsors (e.g., the government scientist must not have had any part in the development or prior review of the scientific information and must not hold a position of managerial or policy responsibility).

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<sup>28</sup> National Academy of Sciences, "Policy and Procedures on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports," May 2003: Available at:

We also considered whether a reviewer can be independent of the agency if that reviewer receives a substantial amount of research funding from the agency sponsoring the review. Research grants that were awarded to the scientist based on investigator-initiated, competitive, peer-reviewed proposals do not generally raise issues of independence. However, significant consulting and contractual relationships with the agency may raise issues of independence or conflict, depending upon the situation.

Section III(3)(d) addresses concerns regarding repeated use of the same reviewer in multiple assessments. Such repeated use should be avoided unless a particular reviewer's expertise is essential. Agencies should rotate membership across the available pool of qualified reviewers. Similarly, when using standing panels of scientific advisors, it is suggested that the agency rotate membership among qualified scientists in order to obtain fresh perspectives and reinforce the reality and perception of independence from the agency.

Section III(4) requires agencies to provide reviewers with sufficient background information, including access to key studies, data and models, to perform their role as peer reviewers. In this respect, the peer review envisioned in Section III is more rigorous than some forms of journal peer review, where the reviewer is often not provided access to underlying data or models. Reviewers shall be informed of applicable access, objectivity, reproducibility and other quality standards under federal information quality laws.

Section III(5) addresses opportunity for public participation in peer review, and provides that the agency shall, wherever possible, provide for public participation. In some cases, an assessment may be so sensitive that it is critical that the agency's assessment achieve a high level of quality before it is publicized. In those situations, a rigorous yet confidential peer review process may be appropriate, prior to public release of the assessment. If an agency decides to make a draft assessment publicly available at the

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<http://www.nationalacademies.org/coi/index.html>.

onset of a peer review process, the agency shall, whenever possible, provide a vehicle for the public to provide written comments, make an oral presentation before the peer reviewers, or both. When written public comments are received, the agency shall ensure that peer reviewers receive copies of comments that address significant scientific issues with ample time to consider them in their review. To avoid undue delay of agency activities, the agency shall specify time limits for public participation throughout the peer review process.

Section III(6) requires that agencies instruct reviewers to prepare a peer review report that describes the nature and scope of their review and their findings and conclusions. The report shall disclose the name of each peer reviewer and a brief description of his or her organizational affiliation, credentials and relevant experiences. The peer review report should either summarize the views of the group as a whole (including any dissenting views) or include a verbatim copy of the comments of the individual reviewers (with or without attribution of specific views to specific names). The agency shall also prepare a written response to the peer review report, indicating whether the agency agrees with the reviewers and what actions the agency has taken or plans to take to address the points made by reviewers. The agency is required to disseminate the peer review report and the agency's response to the report on the agency's website, including all the materials related to the peer review such as the charge statement, peer review report, and agency response to the review. If the scientific information is used to support a final rule then, where practicable, the peer review report shall be made available to the public with enough time for the public to consider the implications of the peer review report for the rule being considered.

Section III(7) authorizes but does not require an agency to commission an entity independent of the agency to select peer reviewers and/or manage the peer review process in accordance with this Bulletin. The entity may be a scientific or professional society, a firm specializing in peer review, or a non-profit organization with experience in peer review.

#### Section IV: Alternative Procedures

Peer review as described in this Bulletin is only one of many procedures that agencies can employ to ensure an appropriate degree of pre-dissemination quality of influential scientific information. For example, Congress has assigned the NAS a special role in advising the federal government on scientific and technical issues. The procedures of the NAS are generally quite rigorous, and thus agencies should presume that major findings, conclusions, and recommendations of NAS reports meet the performance standards of this Bulletin.

As an alternative to complying with Sections II and III of this Bulletin, an agency may instead (1) rely on scientific information produced by the National Academy of Sciences, (2) commission the National Academy of Sciences to peer review an agency draft scientific information product, or (3) employ an alternative procedure or set of procedures, specifically approved by the OIRA Administrator in consultation with the Office of Science and Technology Policy (OSTP), that ensures that the scientific information product meets applicable information-quality standards.

An example of an alternative procedure is to commission a respected third party other than the NAS (e.g., the Health Effects Institute or the National Commission on Radiation Protection and Measurement) to conduct an assessment or series of related assessments. Another example of an alternative set of procedures is the three-part process used by the National Institutes of Health (NIH) to generate scientific guidance. Under that process, a scientific proposal or white paper is generated by a working group composed of external, independent scientific experts; that paper is then forwarded to a separate external scientific council, which then makes recommendations to the agency. The agency, in turn, decides whether to adopt and/or modify the proposal. For large science agencies that have diverse research portfolios and do not have significant regulatory responsibilities, such as NIH, an acceptable alternative would be to allow scientists from one part of the agency (for example, an NIH institute) to participate in the review of documents prepared by another part of the agency, as long as the head of the agency

confirms in writing that each of the reviewers meets the NAS criteria relating to the appropriateness of using employees of sponsors (e.g., the government scientist must not have had any part in the development or prior review of the scientific information and must not hold a position of managerial or policy responsibility). The purpose of Section IV is to encourage these types of innovation in the methods used to ensure pre-dissemination quality control of influential scientific information.

The mere existence of a public comment process (e.g., notice-and-comment procedures under the Administrative Procedure Act) does not constitute adequate peer review or an “alternative process,” because it does not assure that qualified, impartial specialists in relevant fields have performed a critical evaluation of the agency's draft product.<sup>29</sup>

#### Section V: Peer Review Planning

Section V requires agencies to begin a systematic process of peer review planning for influential scientific information (including highly influential scientific assessments) that the agency plans to disseminate in the foreseeable future. A key feature of this planning process is a web-accessible listing of forthcoming influential scientific disseminations (i.e., an agenda) that is regularly updated by the agency. By making these plans publicly available, agencies will be able to gauge the extent of public interest in the peer review process for influential scientific information, including highly influential scientific assessments. These web-accessible agendas can also be used by the public to monitor agency compliance with this Bulletin.

Each entry on the agenda shall include a preliminary title of the planned report, a short paragraph describing the subject and purpose of the planned report, and an agency contact person. The agency shall provide its prediction regarding whether the dissemination will be “influential scientific information” or a “highly influential scientific assessment,” as the designation can influence the type of peer review to be undertaken.

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<sup>29</sup> William W. Lowrance, Modern Science and Human Values, Oxford University Press, New York, NY 1985: 86.

The agency shall discuss the timing of the peer review, as well as the use of any deferrals. Agencies shall include entries in the agenda for influential scientific information, including highly influential scientific assessments, for which the Bulletin's requirements have been deferred or waived. If the agency, in consultation with the OIRA Administrator, has determined that it is appropriate to use a Section IV "alternative procedure" for a specific dissemination, a description of that alternative procedure shall be included in the agenda.

Furthermore, for each entry on the agenda, the agency shall describe the peer review plan. Each peer review plan shall include: (i) a paragraph including the title, subject and purpose of the planned report, as well as an agency contact to whom inquiries may be directed to learn the specifics of the plan; (ii) whether the dissemination is likely to be influential scientific information or a highly influential scientific assessment; (iii) the timing of the review (including deferrals); (iv) whether the review will be conducted through a panel or individual letters (or whether an alternative procedure will be exercised); (v) whether there will be opportunities for the public to comment on the work product to be peer reviewed, and if so, how and when these opportunities will be provided; (vi) whether the agency will provide significant and relevant public comments to the peer reviewers before they conduct their review; (vii) the anticipated number of reviewers (3 or fewer; 4-10; or more than 10); (viii) a succinct description of the primary disciplines or expertise needed in the review; (ix) whether reviewers will be selected by the agency or by a designated outside organization; and (x) whether the public, including scientific or professional societies, will be asked to nominate potential peer reviewers. The agency shall provide a link from the agenda to each document made public pursuant to this Bulletin. Agencies shall link their peer review agendas to the U.S. Government's official web portal: *firstgov* at <http://www.FirstGov.gov>

Agencies should update their peer review agendas at least every six months. However, in some cases -- particularly for highly influential scientific assessments and other particularly important information -- more frequent updates of existing entries on the agenda, or the addition of new entries to the agenda, may be warranted. When new

entries are added to the agenda of forthcoming reports and other information, the public should be provided with sufficient time to comment on the agency's peer review plan for that report or product. Agencies shall consider public comments on the peer review plan. Agencies are encouraged to offer a listserv or similar mechanism for members of the public who would like to be notified by email each time an agency's peer review agenda has been updated.

The peer review planning requirements of this Bulletin are designed to be implemented in phases. Specifically, the planning requirements of the Bulletin will go into effect for documents subject to Section III of the Bulletin (highly influential scientific assessments) six months after publication. However, the planning requirements for documents subject to Section II of the Bulletin do not go into effect until one year after publication. It is expected that agency experience with the planning requirements of the Bulletin for the smaller scope of documents encompassed in Section III will be used to inform implementation of these planning requirements for the larger scope of documents covered under Section II.

#### Section VI: Annual Report

Each agency shall prepare an annual report that summarizes key decisions made pursuant to this Bulletin. In particular, each agency should provide to OIRA the following: 1) the number of peer reviews conducted subject to the Bulletin (i.e., for influential scientific information and highly influential scientific assessments); 2) the number of times alternative procedures were invoked; 3) the number of times waivers or deferrals were invoked (and in the case of deferrals, the length of time elapsed between the deferral and the peer review); 4) any decision to appoint a reviewer pursuant to any exception to the applicable independence or conflict of interest standards of the Bulletin, including determinations by the Secretary or Deputy Secretary pursuant to Section III (3) (c); 5) the number of peer review panels that were conducted in public and the number that allowed public comment; 6) the number of public comments provided on the agency's peer

review plans; and 7) the number of peer reviewers that the agency used that were recommended by professional societies.

#### Section VII: Certification in the Administrative Record

If an agency relies on influential scientific information or a highly influential scientific assessment subject to the requirements of this Bulletin in support of a regulatory action, the agency shall include in the administrative record for that action a certification that explains how the agency has complied with the requirements of this Bulletin and the Information Quality Act. Relevant materials are to be placed in the administrative record.

#### Section VIII: Safeguards, Deferrals, and Waivers

Section VIII recognizes that individuals serving as peer reviewers have a privacy interest in information about themselves that the government maintains and retrieves by name or identifier from a system of records. To the extent information about a reviewer (name, credential, affiliation) will be disclosed along with his/her comments or analysis, the agency must comply with the requirements of the Privacy Act, 5 U.S.C. 552a, as amended, and OMB Circular A-130, Appendix I, 61 Fed. Reg. 6428 (February 20, 1996) to establish appropriate routine uses in a published System of Records Notice. Furthermore, the peer review must be conducted in a manner that respects confidential business information as well as intellectual property.

Section VIII also allows for a deferral or waiver of the requirements of the Bulletin where necessary. Specifically, the agency head may waive or defer some or all of the peer review requirements of Sections II or III of this Bulletin if there is a compelling rationale for waiver or deferral. Waivers will seldom be warranted under this provision because the Bulletin already provides significant safety valves, such as: the exemptions provided in Section IX, including the exemption for time-sensitive health and safety information;

the authorization for alternative procedures in Section IV; and the overall flexibility provided for peer reviews of influential scientific information under Section II. Nonetheless, we have included this waiver and deferral provision to ensure needed flexibility in unusual and compelling situations not otherwise covered by the exemptions to the Bulletin, such as situations where unavoidable legal deadlines prevent full compliance with the Bulletin before information is disseminated. Deadlines found in consent decrees agreed to by agencies after the Bulletin is issued will not ordinarily warrant waiver of the Bulletin's requirements because those deadlines should be negotiated to permit time for all required procedures, including peer review. In addition, when an agency is unavoidably up against a deadline, deferral of some or all requirements of the Bulletin (as opposed to outright waiver of all of them) is the most appropriate accommodation between the need to satisfy immovable deadlines and the need to undertake proper peer review. If the agency head defers any of the peer review requirements prior to dissemination, peer review should be conducted as soon as practicable thereafter.

#### Section IX: Exemptions

There are a variety of situations where agencies need not conduct peer review under this Bulletin. These include, for example, disseminations of sensitive information related to certain national security, foreign affairs, or negotiations involving international treaties and trade where compliance with this Bulletin would interfere with the need for secrecy or promptness.

This Bulletin does not cover official disseminations that arise in adjudications and permit proceedings, unless the agency determines that peer review is practical and appropriate and that the influential dissemination is scientifically or technically novel (i.e., a major change in accepted practice) or likely to have precedent-setting influence on future adjudications or permit proceedings. This exclusion is intended to cover, among other things, licensing, approval and registration processes for specific product development activities as well as site-specific activities. The determination as to whether peer review

is practical and appropriate is left to the discretion of the agency. While this Bulletin is not broadly applicable to adjudications, agencies are encouraged to hold peer reviews of scientific assessments supporting adjudications to the same technical standards as peer reviews covered by the Bulletin, including transparency and disclosure of the data and models underlying the assessments. Protections apply to confidential business information.

The Bulletin does not cover time-sensitive health and safety disseminations, for example, a dissemination based primarily on data from a recent clinical trial that was adequately peer reviewed before the trial began. For this purpose, “health” includes public health, or plant or animal infectious diseases.

This Bulletin covers original data and formal analytic models used by agencies in Regulatory Impact Analyses (RIAs). However, the RIA documents themselves are already reviewed through an interagency review process under E.O. 12866 that involves application of the principles and methods defined in OMB Circular A-4. In that respect, RIAs are excluded from coverage by this Bulletin, although agencies are encouraged to have RIAs reviewed by peers within the government for adequacy and completeness.

The Bulletin does not cover accounting, budget, actuarial, and financial information including that which is generated or used by agencies that focus on interest rates, banking, currency, securities, commodities, futures, or taxes.

Routine statistical information released by federal statistical agencies (e.g., periodic demographic and economic statistics) and analyses of these data to compute standard indicators and trends (e.g., unemployment and poverty rates) is excluded from this Bulletin.

The Bulletin does not cover information disseminated in connection with routine rules that materially alter entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof.

If information is disseminated pursuant to an exemption to this Bulletin, subsequent disseminations are not automatically exempted. For example, if influential scientific information is first disseminated in the course of an exempt agency adjudication, but is later disseminated in the context of a non-exempt rulemaking, the subsequent dissemination will be subject to the requirements of this Bulletin even though the first dissemination was not.

#### Section X: OIRA and OSTP Responsibilities

OIRA, in consultation with OSTP, is responsible for overseeing agency implementation of this Bulletin. In order to foster learning about peer review practices across agencies, OIRA and OSTP shall form an interagency workgroup on peer review that meets regularly, discusses progress and challenges, and recommends improvements to peer review practices.

#### Section XI: Effective Date and Existing Law

The requirements of this Bulletin, with the exception of Section V, apply to information disseminated on or after six months after publication of this Bulletin. However, the Bulletin does not apply to information that is already being addressed by an agency-initiated peer review process (e.g., a draft is already being reviewed by a formal scientific advisory committee established by the agency). An existing peer review mechanism mandated by law should be implemented by the agency in a manner as consistent as possible with the practices and procedures outlined in this Bulletin. The requirements of Section V apply to “highly influential scientific assessments,” as designated in Section III of the Bulletin, within six months of publication of the final Bulletin. The requirements in Section V apply to documents subject to Section II of the Bulletin one year after publication of the final Bulletin.

## Section XII: Judicial Review

This Bulletin is intended to improve the internal management of the Executive Branch and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity, against the United States, its agencies or other entities, its officers or employees, or any other person.

### **Bulletin for Peer Review**

#### **I. Definitions.**

For purposes of this Bulletin --

1. the term “Administrator” means the Administrator of the Office of Information and Regulatory Affairs in the Office of Management and Budget (OIRA);

2. the term “agency” has the same meaning as in the Paperwork Reduction Act, 44 U.S.C. § 3502(1);

3. the term “dissemination” means agency initiated or sponsored distribution of information to the public (see 5 C.F.R. 1320.3(d) (definition of “Conduct or Sponsor”)). Dissemination does not include distribution limited to government employees or agency contractors or grantees; intra- or inter-agency use or sharing of government information; or responses to requests for agency records under the Freedom of Information Act, the Privacy Act, the Federal Advisory Committee Act, the Government Performance and Results Act or similar law. This definition also excludes distribution limited to correspondence with individuals or persons, press releases, archival records, public filings, subpoenas and adjudicative processes. The term “dissemination” also excludes information distributed for peer review in compliance with this Bulletin, provided that the distributing agency includes a clear disclaimer on the information as follows: “THIS INFORMATION IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PRE-DISSEMINATION PEER REVIEW UNDER APPLICABLE INFORMATION

QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY [THE AGENCY]. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.”

For the purposes of this Bulletin, “dissemination” excludes research produced by government-funded scientists (e.g., those supported extramurally or intramurally by federal agencies or those working in state or local governments with federal support) if that information does not represent the views of an agency. To qualify for this exemption, the information should display a clear disclaimer that “the findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the funding agency”;

4. the term “Information Quality Act” means Section 515 of Public Law 106-554 (Pub. L. No. 106-554, § 515, 114 Stat. 2763, 2763A-153-154 (2000));

5. the term “scientific information” means factual inputs, data, models, analyses, technical information, or scientific assessments based on the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences. This includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. This definition includes information that an agency disseminates from a web page, but does not include the provision of hyperlinks to information that others disseminate. This definition does not include opinions, where the agency’s presentation makes clear that what is being offered is someone’s opinion rather than fact or the agency’s views;

6. the term “influential scientific information” means scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions; and

7. the term “scientific assessment” means an evaluation of a body of scientific or technical knowledge, which typically synthesizes multiple factual inputs, data, models, assumptions, and/or applies best professional judgment to bridge uncertainties in the available information. These assessments include, but are not limited to, state-of-science reports; technology assessments; weight-of-evidence analyses; meta-analyses; health,

safety, or ecological risk assessments; toxicological characterizations of substances; integrated assessment models; hazard determinations; or exposure assessments.

## **II. Peer Review of Influential Scientific Information.**

1. In General: To the extent permitted by law, each agency shall conduct a peer review on all influential scientific information that the agency intends to disseminate. Peer reviewers shall be charged with reviewing scientific and technical matters, leaving policy determinations for the agency. Reviewers shall be informed of applicable access, objectivity, reproducibility and other quality standards under the federal laws governing information access and quality.

2. Adequacy of Prior Peer Review: For information subject to this section of the Bulletin, agencies need not have further peer review conducted on information that has already been subjected to adequate peer review. In determining whether prior peer review is adequate, agencies shall give due consideration to the novelty and complexity of the science to be reviewed, the importance of the information to decision making, the extent of prior peer reviews, and the expected benefits and costs of additional review. Principal findings, conclusions and recommendations in official reports of the National Academy of Sciences are generally presumed to have been adequately peer reviewed.

### 3. Selection of Reviewers:

a. Expertise and Balance: Peer reviewers shall be selected based on expertise, experience and skills, including specialists from multiple disciplines, as necessary. The group of reviewers shall be sufficiently broad and diverse to fairly represent the relevant scientific and technical perspectives and fields of knowledge. Agencies shall consider requesting that the public, including scientific and professional societies, nominate potential reviewers.

b. Conflicts: The agency – or the entity selecting the peer reviewers – shall (i) ensure that those reviewers serving as federal employees (including special government employees) comply with applicable federal ethics requirements; (ii) in selecting peer reviewers who are not government employees, adopt or adapt the National Academy of Sciences policy for committee selection with respect to evaluating the potential for

conflicts (e.g., those arising from investments; agency, employer, and business affiliations; grants, contracts and consulting income). For scientific information relevant to specific regulations, the agency shall examine a reviewer's financial ties to regulated entities (e.g., businesses), other stakeholders, and the agency.

c. Independence: Peer reviewers shall not have participated in development of the work product. Agencies are encouraged to rotate membership on standing panels across the pool of qualified reviewers. Research grants that were awarded to scientists based on investigator-initiated, competitive, peer-reviewed proposals generally do not raise issues as to independence or conflicts.

4. Choice of Peer Review Mechanism: The choice of a peer review mechanism (for example, letter reviews or ad hoc panels) for influential scientific information shall be based on the novelty and complexity of the information to be reviewed, the importance of the information to decision making, the extent of prior peer review, and the expected benefits and costs of review, as well as the factors regarding transparency described in II(5).

5. Transparency: The agency -- or entity managing the peer review -- shall instruct peer reviewers to prepare a report that describes the nature of their review and their findings and conclusions. The peer review report shall either (a) include a verbatim copy of each reviewer's comments (either with or without specific attributions) or (b) represent the views of the group as a whole, including any disparate and dissenting views. The agency shall disclose the names of the reviewers and their organizational affiliations in the report. Reviewers shall be notified in advance regarding the extent of disclosure and attribution planned by the agency. The agency shall disseminate the final peer review report on the agency's website along with all materials related to the peer review (any charge statement, the peer review report, and any agency response). The peer review report shall be discussed in the preamble to any related rulemaking and included in the administrative record for any related agency action.

6. Management of Peer Review Process and Reviewer Selection: The agency may commission independent entities to manage the peer review process, including the selection of peer reviewers, in accordance with this Bulletin.

### **III. Additional Peer Review Requirements for Highly Influential Scientific Assessments.**

1. Applicability: This section applies to influential scientific information that the agency or the Administrator determines to be a scientific assessment that:

- (i) could have a potential impact of more than \$500 million in any year, or
- (ii) is novel, controversial, or precedent-setting or has significant interagency interest.

2. In General: To the extent permitted by law, each agency shall conduct peer reviews on all information subject to this Section. The peer reviews shall satisfy the requirements of Section II of this Bulletin, as well as the additional requirements found in this Section. Principal findings, conclusions and recommendations in official reports of the National Academy of Sciences that fall under this Section are generally presumed not to require additional peer review.

#### 3. Selection of Reviewers:

a. Expertise and Balance: Peer reviewers shall be selected based on expertise, experience and skills, including specialists from multiple disciplines, as necessary. The group of reviewers shall be sufficiently broad and diverse to fairly represent the relevant scientific and technical perspectives and fields of knowledge. Agencies shall consider requesting that the public, including scientific and professional societies, nominate potential reviewers.

b. Conflicts: The agency – or the entity selecting the peer reviewers – shall (i) ensure that those reviewers serving as federal employees (including special government employees) comply with applicable federal ethics requirements; (ii) in selecting peer reviewers who are not government employees, adopt or adapt the National Academy of Sciences’ policy for committee selection with respect to evaluating the potential for conflicts (e.g., those arising from investments; agency, employer, and business affiliations; grants, contracts and consulting income). For scientific assessments relevant

to specific regulations, a reviewer's financial ties to regulated entities (e.g., businesses), other stakeholders, and the agency shall be examined.

c. Independence: In addition to the requirements of Section II (3)(c), which shall apply to all reviews conducted under Section III, the agency -- or entity selecting the reviewers -- shall bar participation of scientists employed by the sponsoring agency unless the reviewer is employed only for the purpose of conducting the peer review (i.e., special government employees). The only exception to this bar would be the rare case where the agency determines, using the criteria developed by NAS for evaluating use of "employees of sponsors," that a premier government scientist is (a) not in a position of management or policy responsibility and (b) possesses essential expertise that cannot be obtained elsewhere. Furthermore, to be eligible for this exception, the scientist must be employed by a different agency of the Cabinet-level department than the agency that is disseminating the scientific information. The agency's determination shall be documented in writing and approved, on a non-delegable basis, by the Secretary or Deputy Secretary of the department prior to the scientist's appointment.

d. Rotation: Agencies shall avoid repeated use of the same reviewer on multiple assessments unless his or her participation is essential and cannot be obtained elsewhere.

4. Information Access: The agency -- or entity managing the peer review -- shall provide the reviewers with sufficient information -- including background information about key studies or models -- to enable them to understand the data, analytic procedures, and assumptions used to support the key findings or conclusions of the draft assessment.

5. Opportunity for Public Participation: Whenever feasible and appropriate, the agency shall make the draft scientific assessment available to the public for comment at the same time it is submitted for peer review (or during the peer review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the peer reviewers by interested members of the public. When employing a public comment process as part of the peer review, the agency shall, whenever practical, provide peer reviewers with access to public comments that address significant scientific or technical issues. To ensure that public participation does not unduly delay agency activities, the agency shall clearly specify time limits for public participation throughout the peer review process.

6. Transparency: In addition to the requirements specified in II(5), which shall apply to all reviews conducted under Section III, the peer review report shall include the charge to the reviewers and a short paragraph on both the credentials and relevant experiences of each peer reviewer. The agency shall prepare a written response to the peer review report explaining (a) the agency's agreement or disagreement with the views expressed in the report, (b) the actions the agency has undertaken or will undertake in response to the report, and (c) the reasons the agency believes those actions satisfy the key concerns stated in the report (if applicable). The agency shall disseminate its response to the peer review report on the agency's website with the related material specified in Section II(5).

7. Management of Peer Review Process and Reviewer Selection: The agency may commission independent entities to manage the peer review process, including the selection of peer reviewers, in accordance with this Bulletin.

#### **IV. Alternative Procedures.**

As an alternative to complying with Sections II and III of this Bulletin, an agency may instead: (i) rely on the principal findings, conclusions and recommendations of a report produced by the National Academy of Sciences; (ii) commission the National Academy of Sciences to peer review an agency's draft scientific information; or (iii) employ an alternative scientific procedure or process, specifically approved by the Administrator in consultation with the Office of Science and Technology Policy (OSTP), that ensures the agency's scientific information satisfies applicable information quality standards. The alternative procedure(s) may be applied to a designated report or group of reports.

#### **V. Peer Review Planning.**

1. Peer Review Agenda: Each agency shall post on its website, and update at least every six months, an agenda of peer review plans. The agenda shall describe all planned and ongoing influential scientific information subject to this Bulletin. The agency shall provide a link from the agenda to each document that has been made public pursuant to

this Bulletin. Agencies are encouraged to offer a listserv or similar mechanism to alert interested members of the public when entries are added or updated.

2. Peer Review Plans: For each entry on the agenda the agency shall describe the peer review plan. Each peer review plan shall include: (i) a paragraph including the title, subject and purpose of the planned report, as well as an agency contact to whom inquiries may be directed to learn the specifics of the plan; (ii) whether the dissemination is likely to be influential scientific information or a highly influential scientific assessment; (iii) the timing of the review (including deferrals); (iv) whether the review will be conducted through a panel or individual letters (or whether an alternative procedure will be employed); (v) whether there will be opportunities for the public to comment on the work product to be peer reviewed, and if so, how and when these opportunities will be provided; (vi) whether the agency will provide significant and relevant public comments to the peer reviewers before they conduct their review; (vii) the anticipated number of reviewers (3 or fewer; 4-10; or more than 10); (viii) a succinct description of the primary disciplines or expertise needed in the review; (ix) whether reviewers will be selected by the agency or by a designated outside organization; and (x) whether the public, including scientific or professional societies, will be asked to nominate potential peer reviewers.

3. Public Comment: Agencies shall establish a mechanism for allowing the public to comment on the adequacy of the peer review plans. Agencies shall consider public comments on peer review plans.

## **VI. Annual Reports.**

Each agency shall provide to OIRA, by December 15 of each year, a summary of the peer reviews conducted by the agency during the fiscal year. The report should include the following: 1) the number of peer reviews conducted subject to the Bulletin (i.e., for influential scientific information and highly influential scientific assessments); 2) the number of times alternative procedures were invoked; 3) the number of times waivers or deferrals were invoked (and in the case of deferrals, the length of time elapsed between the deferral and the peer review); 4) any decision to appoint a reviewer pursuant to any exception to the applicable independence or conflict of interest standards of the Bulletin,

including determinations by the Secretary pursuant to Section III(3)(c); 5) the number of peer review panels that were conducted in public and the number that allowed public comment; 6) the number of public comments provided on the agency's peer review plans; and 7) the number of peer reviewers that the agency used that were recommended by professional societies.

## **VII. Certification in the Administrative Record.**

If an agency relies on influential scientific information or a highly influential scientific assessment subject to this Bulletin to support a regulatory action, it shall include in the administrative record for that action a certification explaining how the agency has complied with the requirements of this Bulletin and the applicable information quality guidelines. Relevant materials shall be placed in the administrative record.

## **VIII. Safeguards, Deferrals, and Waivers.**

1. Privacy: To the extent information about a reviewer (name, credentials, affiliation) will be disclosed along with his/her comments or analysis, the agency shall comply with the requirements of the Privacy Act, 5 U.S.C. § 522a as amended, and OMB Circular A-130, Appendix I, 61 Fed. Reg. 6428 (February 20, 1996) to establish appropriate routine uses in a published System of Records Notice.

2. Confidentiality: Peer review shall be conducted in a manner that respects (i) confidential business information and (ii) intellectual property.

3. Deferral and Waiver: The agency head may waive or defer some or all of the peer review requirements of Sections II and III of this Bulletin where warranted by a compelling rationale. If the agency head defers the peer review requirements prior to dissemination, peer review shall be conducted as soon as practicable.

## **IX. Exemptions.**

Agencies need not have peer review conducted on information that is:

1. related to certain national security, foreign affairs, or negotiations involving international trade or treaties where compliance with this Bulletin would interfere with the need for secrecy or promptness;
2. disseminated in the course of an individual agency adjudication or permit proceeding (including a registration, approval, licensing, site-specific determination), unless the agency determines that peer review is practical and appropriate and that the influential dissemination is scientifically or technically novel or likely to have precedent-setting influence on future adjudications and/or permit proceedings;
3. a health or safety dissemination where the agency determines that the dissemination is time-sensitive (e.g., findings based primarily on data from a recent clinical trial that was adequately peer reviewed before the trial began);
4. an agency regulatory impact analysis or regulatory flexibility analysis subject to interagency review under Executive Order 12866, except for underlying data and analytical models used;
5. routine statistical information released by federal statistical agencies (e.g., periodic demographic and economic statistics) and analyses of these data to compute standard indicators and trends (e.g., unemployment and poverty rates);
6. accounting, budget, actuarial, and financial information, including that which is generated or used by agencies that focus on interest rates, banking, currency, securities, commodities, futures, or taxes; or
7. information disseminated in connection with routine rules that materially alter entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof.

**X. Responsibilities of OIRA and OSTP.**

OIRA, in consultation with OSTP, shall be responsible for overseeing implementation of this Bulletin. An interagency group, chaired by OSTP and OIRA, shall meet periodically to foster better understanding about peer review practices and to assess progress in implementing this Bulletin.

**XI. Effective Date and Existing Law.**

The requirements of this Bulletin, with the exception of those in Section V (Peer Review Planning), apply to information disseminated on or after six months following publication of this Bulletin, except that they do not apply to information for which an agency has already provided a draft report and an associated charge to peer reviewers. Any existing peer review mechanisms mandated by law shall be employed in a manner as consistent as possible with the practices and procedures laid out herein. The requirements in Section V apply to “highly influential scientific assessments,” as designated in Section III of this Bulletin, within six months of publication of this Bulletin. The requirements in Section V apply to documents subject to Section II of this Bulletin one year after publication of this Bulletin.

**XII. Judicial Review**

This Bulletin is intended to improve the internal management of the executive branch, and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity, against the United States, its agencies or other entities, its officers or employees, or any other person.

**Appendix IV: August 2009 Briefing Paper on Science Advisor Appointments for 2010-2012**

DRAFT

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Information**  
**August 12-13, 2009**

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Agenda Item

Science Advisor Nominations and Appointments

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Action Requested

✓ Information item only. We will answer questions but no action is requested.

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Presenter

David Garrett, Executive Coordinator, Science Advisors

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Previous Action Taken

- ✓ By TWG  
Discussion was held and input requested from TWG during the March 2009 meeting.
- ✓ By AMWG:  
Discussion was held and input requested from AMWG during the April 2009 meeting.
- ✓ Other: Discussion was held and approval for changes in disciplines received from GCMRC Chief and program managers

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Relevant Science

✓ No research or monitoring is required on this subject.

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Background Information

The Science Advisors' Operating Protocol reads, "AMWG members may provide GCMRC with names of individuals who should be considered for appointment as a Scientific Advisor. . . . Scientific Advisors will be selected from among nominees based on evaluation criteria approved by AMWG. GCMRC will seek the consultation of the AMWG in selecting individuals to serve as GCMRC Scientific Advisors."

The Science Advisor's Executive Coordinator discussed the program activity with with TWG members at the March 2009 TWG meeting and with AMWG members at the April 2009 AMWG meeting, and nominees were requested for three Science Advisor Panel Positions.

The following names were submitted, and were included in the mix of recommended names (see report, next page): Larry Zimmerman, PhD, Indiana University-Purdue University; and Charles Redman, PhD; Arizona State University. An economist's name was also suggested, but the economist post was not vacant.

The attached briefing information presents the adopted process for Science Advisor appointments, the recommended new disciplines for 2010-2012, and the names of the recommended Advisors.

**ADAPTIVE MANAGEMENT WORK GROUP  
BRIEFING PAPER ON SCIENCE ADVISOR APPOINTMENTS FOR 2010-2012**

**AMWG SUMMER MEETING; AUGUST 2009**

**PROTOCOLS FOR SELECTING SCIENCE ADVISORS (SAs)**

The independent group of Science Advisors is managed by an Executive Coordinator who is obtained under an open bid RFP process by GCMRC. This contractor must be an accomplished senior scientist and demonstrate scientific and administrative skills. The Executive Coordinator manages and administers the science advisor group and their accomplishments.

GCMRC manages the Executive Coordinator's accomplishments based on an annual work plan and operating procedures approved by AMWG. The GCMRC Chief also approves new science advisor appointments, with input from the Science Advisors, TWG, and AMWG.

When new science advisors are proposed by the Executive Coordinator, discussions are held and input requested from AMWG, TWG, and GCMRC. The Executive Coordinator then recommends specific appointments to the GCMRC Chief, who makes the final appointments and informs AMWG.

**PROPOSED SCIENCE ADVISOR APPOINTMENTS FOR 2010-2012**

The Executive Coordinator has proposed six permanent science advisor positions for 2010-2012. Three positions are continuing appointments from 2009 as follows.

|                                |                                                |
|--------------------------------|------------------------------------------------|
| Fish Ecologist                 | James Kitchell, PhD<br>University of Wisconsin |
| Adaptive Management Specialist | Lance Gunderson, PhD<br>Emory University       |
| Geomorphologist                | Ellen Wohl, PhD<br>Colorado State University   |

Three Science Advisor replacement positions were discussed and no objections were raised by AMWG in April 2009. The positions and proposed candidates in each position have been recommended to GCMRC as follows. The GCMRC Chief will make the decision after the candidates are reviewed for potential conflicts of interest. We anticipate that the decision will be made by the time of the AMWG meeting, and that it will be announced there.

Science Advisors Nominations, continued

|                   |                                                |
|-------------------|------------------------------------------------|
| Aquatic Ecologist | Jennifer Tank, PhD<br>University of Notre Dame |
|                   | Barry Moore, PhD<br>US Geological Survey       |
|                   | David Lodge, PhD<br>University of Notre Dame   |

|                   |                                                |
|-------------------|------------------------------------------------|
| Systems Ecologist | James Karr, PhD<br>University of Washington    |
|                   | Barry Johnson, PhD<br>US Geological Survey     |
|                   | Robert Naiman, PhD<br>University of Washington |

|                 |                                          |
|-----------------|------------------------------------------|
| System Analysis | James Clark, PhD<br>Duke University      |
|                 | James Grace, PhD<br>USGS                 |
|                 | David Hulse, PhD<br>University of Oregon |

The TWG also recommended that the following part-time positions be involved in systems reviews as well as discipline reviews, as appropriate. Dr. Garrett is proposed to continue his role as both Executive Coordinator and economist discipline specialist for the SAs.

|           |                                                                        |
|-----------|------------------------------------------------------------------------|
| Economist | David Garrett, PhD<br>NAU Professor Emeritus, SA Executive Coordinator |
|-----------|------------------------------------------------------------------------|

|                     |                                                              |
|---------------------|--------------------------------------------------------------|
| Cultural Specialist | Peter Whiteley, PhD<br>American Museum of Natural History    |
|                     | Larry Zimmerman, PhD<br>Indiana University-Purdue University |
|                     | Charles Redman, PhD<br>Arizona State University              |

# Presentation to the AMWG of Selections for Science Advisors Specialists for 2010-2012

L.D. Garrett  
GCDAMP Science Advisor  
Executive Coordinator

Summer AMWG Meeting  
August 12-13, 2009  
Phoenix, AZ

# AMWG Protocol For Science Advisor Appointments

The Science Advisors' Operating Protocol reads, "AMWG members may provide GCMRC with names of individuals who should be considered for appointment as a Science Advisor....Scientific Advisors will be selected from among nominees based on evaluation criteria. GCMRC will seek the consultation of the AMWG in selecting individuals to serve as GCMRC Scientific Advisors."

February, 2009: Garretts' discussions with GCMRC for SA positions for 2010-2012. Agreement to establish a group of six permanent SAs and two part time SAs as follows.

| Status   | Position                                   | Type Appointment |
|----------|--------------------------------------------|------------------|
| Replace  | Cultural Resource Specialist               | Part Time        |
| Continue | Economist (Garrett)                        | Part Time        |
| Replace  | Aquatic Ecologist                          | Full Time        |
| Replace  | Systems Analyst                            | Full Time        |
| Continue | Fish Ecologist (Kitchell)                  | Full Time        |
| Continue | Geomorphologist (Wohl)                     | Full Time        |
| Replace  | Systems Ecologist                          | Full Time        |
| Continue | Adaptive Management Specialist (Gunderson) | Full Time        |

# Replacement Positions for Science Advisors 2010-2012

| Position                     | Type Appointment |
|------------------------------|------------------|
| Cultural Resource Specialist | Part Time        |
| System Ecologist             | Full Time        |
| Systems Analyst              | Full Time        |
| Aquatic Ecologist            | Full Time        |

## Appendix V: Origins and Evolution of the Glen Canyon Dam Adaptive Management Program Science Advisors Program, 1995-2015

### Independent Review Panels and the Science Advisors Program

The 1995 Final Environmental Impact Statement (1995 FEIS) on the Operation of Glen Canyon Dam, Colorado River Storage Project, Arizona, led to the establishment of the Glen Canyon Dam Adaptive Management Program and its Adaptive Management Work Group, Technical Work Group (TWG), and Monitoring and Research Center, later renamed the Grand Canyon Monitoring and Research Center (GCMRC). The GCMRC is part of the U.S. Geological Survey (USGS), Southwest Biological Science Center (SBSC).

The 1995 FEIS, pp. 37-38, further called for the Secretary of the Interior (Secretary) in consultation with the AMWG to establish Independent Review Panel(s) (IRPs):

*“The Independent Review Panel(s) would be comprised of qualified individuals not otherwise participating in the long-term monitoring and research studies. The review panel(s) would be established by the Secretary of the Interior in consultation with the National Academy of Sciences, the tribes, and other AMWG entities. The review panel(s) would be responsible for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and the center [GCMRC] regarding monitoring, priorities, integration, and management. Responsibilities of this review panel would include:<sup>2</sup>*

- *Annual review of the monitoring and research program*
- *Technical advice as requested by the center [GCMRC] or AMWG*
- *Five-year review of monitoring and research protocols”*

The 1995 FEIS (p. 37) also called for the center [GCMRC] to:

- *“Coordinate review of the monitoring and research program with the independent review panel(s)”*

The 1995 FEIS included a diagram showing the reporting relationships among the different components of the overall GCDAMP, reproduced below.

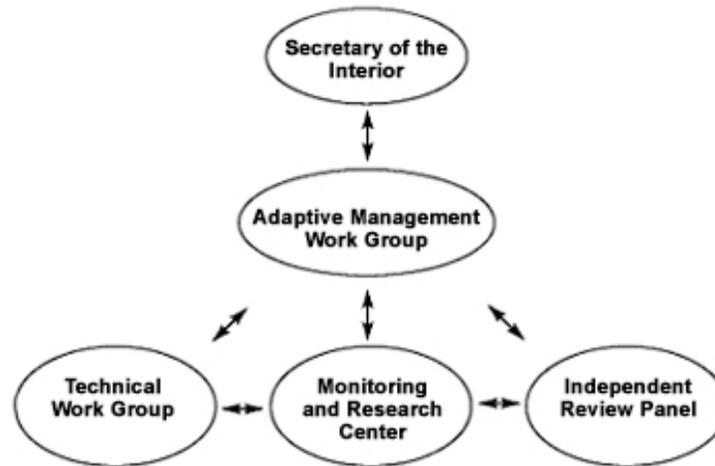
The AMWG assigned to the GCMRC the responsibility for establishing the IRPs. As described in the December 2000 Science Advisors Operating Protocols, the GCMRC responded by:

- (1) Establishing an independent, external peer-review process for all proposals received by GCMRC and scientific reports resulting from GCMRC activities.
- (2) Initiating a contract with the National Research Council (NRC) for review of the GCMRC Long-term Strategic Plan and GCMRC FY 98 and FY 99 Annual Plans. This contract resulted in the 1999 NRC report, “Downstream: Adaptive management of Glen Canyon Dam and the Colorado River Ecosystem.”

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<sup>2</sup> The December 2000 “Operating Protocols, GCMRC Science Advisors, Final,” slightly misquoted these responsibilities – see Appendix I.

- (3) Developing a Protocol Evaluation Program (PEP) for reviewing long-term monitoring protocols.
- (4) Proposing to establish a general-purpose IRP to fulfill the remainder of the requirements identified in the 1995 FEIS, "... for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and the center [GCMRC] regarding monitoring, priorities, integration, and management."



The AMWG approved the Operating Protocols for the GCMRC Science Advisors in December 2000. This document established the general-purpose IRP proposed by the GCMRC and named this IRP, the "Scientific Advisors." The Scientific Advisors consisted of a single standing panel, operating year-round, with member term limits (see below). The December 2000 operating protocols charged the Scientific Advisors with the same responsibilities stated in the 1995 FEIS, "... for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and the center [GCMRC] regarding monitoring, priorities, integration, and management." The December 2000 Operating Protocols also established the position of "[a]n Executive Secretary who will be an employee of, or contractor to the GCMRC [who] will lead the Scientific Advisors to GCMRC."

The December 2000 Operating Protocols described the functions of the Scientific Advisors as follows:

*The Scientific Advisors individually will be expected upon request, among other things, to review and comment on:*

- (1) *results of ongoing and completed monitoring and research program activities, as well as any synthesis and assessment activities initiated by GCMRC,*
- (2) *the appropriateness of GCMRC's RFPs, especially their responsiveness to management objectives,*

- (3) *the protocols used in GCMRC sponsored scientific activities, including a 5-year review of GCMRC monitoring and research protocols,*
- (4) *GCMRC's long-term monitoring plan,*
- (5) *GCMRC's annual monitoring and research plans,*
- (6) *GCMRC's annual budget proposals, to ensure that the science program is efficiently and effectively responding to AMWG goals (i.e., management objectives), and*
- (7) *any other program specific scientific and technical advice it is asked to address by the AMWG, the GCMRC, or the Secretary.*

### **Independent Review Panels and Science Advisors Program, 2000-2015**

The IRPs and the Science Advisors program operated continuously following their inceptions until the end of FY 2014. The Science Advisors program then experienced a hiatus during most of FY15, during which administration of the program changed hands from the GCMRC to Reclamation and Reclamation contracted with a new Executive Coordinator. This hiatus did not affect any other IRP activities.

The character of the IRPs and the Science Advisors program evolved between their inceptions and 2015 in several ways. However, the Science Advisors program Charter and Operating Protocols were not consistently updated to document the changes to this program. The present updated version of the Science Advisors Program Charter and Operating Protocols documents these changes and incorporates additional changes associated with the transfer of administration.

Ten changes stand out in particular between 2000 and 2015 that have implications for the present updating of the Science Advisors Program Charter and Operating Protocols:

- (1) Terminology  
The original terms, "Scientific Advisors" and "Executive Secretary," in practice evolved into "Science Advisors" and "Executive Coordinator." Variant terms and spellings also occur. The updated charter standardizes the terms.
- (2) Administrative Responsibility for Science Advisors Program  
The Secretary transferred administrative responsibility for the Science Advisors program and the Executive Coordinator from the GCMRC to the U.S. Bureau of Reclamation, Upper Colorado Region, Environmental Resource Division (Reclamation), effective with FY 2015. The Executive Coordinator remains a contractor. This change affects several internal procedures for the Science Advisors program, reflected in the present document.
- (3) Assignment and Reporting of Science Advisor Tasks  
The Science Advisors informed the AMWG in June 2004 that the existing protocols for the program "do not explicitly clarify how the Advisors are to receive their list of annual tasks from the AMWG/GCMRC/USDI Secretary's Designee, or report on accomplishments." The Advisors therefore proposed and the AMWG approved (August 2004) adding the following amendment to the existing Operating Protocol Document at

the end of the section on operating procedures (page 5): “Annually the AMWG will, in its summer meeting, review, update and assign a general set of 24-month review tasks and advisory activities for the Science Advisors. The Chief of the GCMRC, TWG Chair and Executive Secretary of the Science Advisors are responsible for providing all necessary inputs to the Chair of the AMWG by May 1 to permit development of the new Science Advisors charge. The Science Advisors or Executive Secretary are to present each May 15 to the Secretary’s Designee, AMWG Chair, GCMRC Chief and TWG Chair a written annual report of accomplishments, including specific documentation of Science Advisor activities. Further, the Advisors, or Executive Secretary, are to report to AMWG in verbal and written reports at each formal AMWG meeting on any review or advisory report completed since the previous AMWG meeting. The Science Advisors and/or the Science Advisors’ Executive Secretary will be available at all formal AMWG meetings to respond as needed to requests for information from AMWG, the Secretary’s Designee or GCMRC.” The updated charter incorporates this amendment.

(4) Responsibility for Appointing Science Advisors

The 1995 FEIS specified that the Independent Review Panel(s) “... would be established by the Secretary of the Interior in consultation with the National Academy of Sciences, the tribes, and other AMWG entities.” In practice, the GCMRC Chief and the Executive Coordinator for the Science Advisors established IRPs without formal input from the Academy. The Executive Coordinator developed recommendations for nominations for Science Advisors in consultation with the AMWG, TWG, and GCMRC, and submitted the final recommendations to the GCMRC Chief. The GCMRC Chief then made the final appointments and informed the AMWG. The updated charter recognizes that, under the terms of the new contract administered by Reclamation for the Executive Coordinator effective with FY 2015, the Executive Coordinator will make all Science Advisor appointments following a careful and transparent process of recruitment for each review described below.

(5) Duration of Science Advisor Appointments

The Science Advisors originally consisted of a single standing panel continuously available to participate in reviews and provide other advice as needed in response to AMWG requests. Each member served a three-year term, renewable for one consecutive three-year term (see Appendix I). The disciplines represented among the Science Advisors followed guidelines established by the AMWG and GCMRC. The GCMRC updated these guidelines in 2009, as discussed at the August 2009 AMWG meeting under the Agenda Item, “Science Advisor Nominations and Appointments” (see Appendix IV, below). The updated charter recognizes that, under the terms of the new contract administered by Reclamation for the Executive Coordinator effective with FY 2015, the Executive Coordinator instead must establish a separate panel and timeline for each review. The timeline for each review must include the time necessary for Reclamation and the Executive Coordinator to agree on a task order and for the Executive Coordinator to recruit the Science Advisors for the required task(s) (see below).

(6) Criteria and Process for Recruiting Science Advisors

The GCMRC updated the criteria and process for recruiting Science Advisors in 2009, as also discussed at the August 2009 AMWG meeting under the Agenda Item, “Science Advisor Nominations and Appointments.” The Executive Coordinator described for that meeting the updated criteria and process in a document, “Adaptive Management Work Group Briefing Paper on Science Advisor Appointments for 2010-2012.” This document was distributed to the AMWG as Attachment 13 to the records of that meeting (see Appendix IV, below). The updated charter for 2016 incorporates all relevant aspects of the 2009 criteria and aligns them with the guidelines established by the U.S. Office of Management and Budget in 2004, “Final Information Quality Bulletin for Peer Review” for all federal governmental agencies. A copy of the OMB guidelines is attached to the present document as Appendix III.

(7) Independent Review of Monitoring and Research Proposals

The GCMRC initially contracted much of its monitoring and research work with outside partners. However, over time the center increased its own monitoring and research capabilities and now carries out almost all such work directly. All work proposals within the GCMRC or submitted by outside collaborators undergo a review that follows USGS procedures under the supervision of the SBSC Deputy Center Director. These procedures follow USGS Fundamental Science Practices<sup>3</sup> that “meet or exceed the standards articulated by the Secretary of the Interior for DOI agencies,” as noted in the GCMRC FY 2010 work plan. Consequently, no additional IRP and external peer-review process was developed for proposals to the GCMRC.

(8) Independent Review of GCMRC Reports

GCMRC scientists must submit all reports they intend to publish, whether in a USGS series or in a peer-reviewed book or journal, for review through the Survey’s own rigorous peer review process. This process also follows USGS Fundamental Science Practices, which “meet or exceed the standards articulated by the Secretary of the Interior for DOI agencies,” as noted in the GCMRC FY 2010 work plan. Consequently, no additional IRP and external peer-review process was developed for scientific reports resulting from GCMRC activities.

(9) Annual Reviews

The 1995 FEIS included “[a]nnual review of the monitoring and research program” in its list of responsibilities for the IRPs, as noted above; and called for the GCMRC to “[c]oordinate review of the monitoring and research program with the independent review panel(s).” It is not clear in the 1995 FEIS whether this call for coordination pertained to the annual reviews, the five-year reviews (see below), or both. In practice, this responsibility appears to have been replaced by an annual review of GCDAMP monitoring and research activities by the TWG, termed the “Annual Reporting” meeting. The TWG conducts this meeting, which consists of presentations on all GCDAMP monitoring and research projects by the GCMRC and other investigators, and serves as the review panel. There does not appear to be any history of having an

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<sup>3</sup> [http://www.usgs.gov/fsp/faqs\\_general.asp](http://www.usgs.gov/fsp/faqs_general.asp)

independent, external annual review of the monitoring and research program. The Science Advisors have provided reviews of specific components of the monitoring and research program, but only upon request rather than as a regular, annual effort. The updated charter, consistent with the 1995 FEIS, recognizes that the GCMRC or AMWG may request the Science Advisors program to conduct an independent review of GCDAMP monitoring and research activities as part of the Annual Reporting process.

(10) Protocol Evaluation Program

The 1995 FEIS also included “[f]ive-year review of monitoring and research protocols” in its list of responsibilities for the IRPs and called for the GCMRC to “[c]oordinate review of the monitoring and research program with the independent review panel(s),” as noted above. The December 2000 Operating Protocols called for the GCMRC to develop the PEP, but also stated that the Science Advisors could be requested “to review and comment on ... the protocols used in GCMRC sponsored scientific activities, including a 5-year review of GCMRC monitoring and research protocols.” In practice, the resulting PEP has operated without routine input from the Science Advisors program. The GCMRC has organized the PEP reviews of all monitoring and research protocols, some of which were developed and implemented in cooperation with other agencies.<sup>4</sup> The updated charter, consistent with the 1995 FEIS, recognizes that the GCMRC or AMWG may request that the Science Advisors program assist the GCMRC with the planning or implementation of individual Protocol Evaluations (*aka* Protocol Evaluation Panels).

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<sup>4</sup> Agencies cooperating in GCDAMP monitoring and research include the U.S. Bureau of Reclamation, the U.S. National Park Service, the U.S. Fish and Wildlife Service, the Arizona Game and Fish Department, and Tribal resource management offices.

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Form**  
**May 25, 2016**

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Agenda Item

FY 2017 Budget and Work Plan

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Purpose

To give Adaptive Management Work Group (AMWG) members a preview of proposed changes to the FY 2017 budget and work plan and to receive their feedback, in preparation for an AMWG recommendation to the Secretary on this subject in August 2016.

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Action Requested

Feedback requested from AMWG members.

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Presenters

Shane Capron, TWG Vice-Chair and TWG Budget Ad Hoc Group Chair  
Katrina Grantz, Chief, Adaptive Management Group, Bureau of Reclamation  
Scott VanderKooi, Chief, Grand Canyon Monitoring and Research Center

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Previous Action Taken

By AMWG:

On August 28, 2014, AMWG passed the following motion by consensus: AMWG recommends the FY2015-17 Triennial Budget and Work Plan from the Bureau of Reclamation and the Grand Canyon Monitoring and Research Center, as presented to the AMWG at their meeting August 27-28, 2014, to the Secretary of the Interior for approval.

By the Secretary of the Interior:

On September 29, 2014, Secretary Jewell approved the GCDAMP FY 2015-17 Triennial Budget and Work Plan.

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Relevant Science

- Memo from Anne Castle on GCDAMP Triennial Budget and Work Plan dated May 17, 2014: [http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14may27/Attach\\_02b.pdf](http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14may27/Attach_02b.pdf)
- Final FY2015-17 Budget and Work Plan (approved by the AMWG on August 28, 2014): [http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14aug27/Attach\\_06f.pdf](http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14aug27/Attach_06f.pdf)
- Report and Recommendations Memo from Secretary's Designee Anne Castle to DOI Secretary Sally Jewell (dated Sept. 29, 2014): [http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14aug27/Attach\\_11.pdf](http://www.usbr.gov/uc/rm/amp/amwg/mtgs/14aug27/Attach_11.pdf)

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Summary of Presentation and Background Information

In May 2014, the Secretary's Designee directed the Grand Canyon Monitoring and Research Center (GCMRC) and the Bureau of Reclamation (Reclamation) to create a three-year budget and work plan for the Glen Canyon Dam Adaptive Management Program (GCDAMP) for FY15-17, and to

work with the AMWG and TWG to create a new process for development of future three-year budget and work plans. While the GCDAMP FY15-17 Triennial Budget and Work Plan (TWP) was completed and approved by the Secretary, the three-year budget process is still in development.

While the process will greatly streamline budget development, the TWG and AMWG are still required to review the TWP every year to be consistent with the Federal budget process. In FY 2016, the TWG and AMWG will review the TWP with GCMRC and Reclamation, and the AMWG at its August meeting will provide a recommendation to the Secretary regarding the FY 2017 budget.

Shane Capron, TWG Budget Ad Hoc Group Chair, will discuss ongoing development of the triennial budget process, including the process for FY17. Katrina Grantz and Scott VanderKooi will provide an overview of any proposed changes to the Reclamation and GCMRC budgets for FY17.

The TWP was developed with a projected annual Consumer Price Index (CPI) of 3.0%. The CPI was actualized at 1.7% in October 2014 and 0% in October 2015. The original estimate of the FY15 TWP at projected CPI of 3.0% of \$10,892,444 was reduced to the actual CPI of 1.7% (\$10,754,967). Since the actual CPI for FY16 was 0%, funding for this fiscal year was also \$10,754,967 versus the original estimate of \$11,219,217. FY17 funding was projected to be \$11,555,794, but will be lower due to the compounding effect of lower-than-projected CPI rates. The CPI for the first six months of FY16 is approximately 0%. If the CPI remains at this level through September, then funding for FY17 would again be \$10,754,967.

U.S. Geological Survey (USGS) overhead rates for FY15, FY16, and FY17 have been revised downward due to lower than anticipated lease costs. GSA, on behalf of USGS, has renegotiated lease rates with the City of Flagstaff for current facilities until the new USGS building is constructed and occupied, now projected for January 2018. Overhead rates decreased from the initial estimates of 15.6% to 13.6% in FY15 and from 21.3% to 11.9% in FY16. The FY17 rate was estimated to be 27.4%, and is now projected to be approximately 12%.

Reclamation and GCMRC will discuss the effects of changes in the CPI and USGS overhead rates on the budget, as well as other potential changes for FY17. Budget shortfalls are projected to be offset by reduced overhead rates, additional funding received from USGS and the Southwest Biological Science Center, and salary savings from unfilled positions.

**Glen Canyon Dam Technical Work Group**  
**Agenda Item Form**  
**May 25, 2016**

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Agenda Item

Basin Hydrology and WY 2017 Hydrograph

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Purpose

This update on the current basin hydrology, and briefing on the development of the 2017 Hydrograph, is designed to prepare the Adaptive Management Work Group (AMWG) for considering a recommendation on the hydrograph from the Technical Work Group (TWG), and making a recommendation to the Secretary, at its August 24-25, 2016 meeting.

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Action Requested

Feedback requested from AMWG members.

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Presenters

Paul Davidson, Hydraulic Engineer, Water Resources Group, Resources Management Division, Upper Colorado Region, Bureau of Reclamation

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Previous Action Taken

By AMWG: At the August 2015 AMWG meeting, AMWG recommended to the Secretary of the Interior her approval of the DOI-DOE Proposed Hydrograph for Water Year 2016.

By TWG: The TWG has been presented with an initial proposal for the WY 2017 Hydrograph and operational scenarios based on the range of current projected hydrology. TWG members will consider a recommendation to AMWG during their June 14-15, 2016 meeting.

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Relevant Science

The anticipated range of conditions and objectives for 2017 remain similar to previous years; therefore, the targeted approach adopted as the 2012, 2013, 2014, 2015, and 2016 Hydrographs is recommended again for the WY 2017 Hydrograph.

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Background Information

**Basin Hydrology**

The presentation is intended to provide pertinent information to AMWG members on the current water supply and forecasted hydrologic conditions within the Upper Colorado River Basin. The presentation will focus on projected reservoir conditions and operations at Lake Powell/Glen Canyon Dam for the remainder of water year 2016 and provide a general outlook for 2017. The presentation will cover the range of potential releases in the current and upcoming water years. Such information is provided to assist the AMWG in developing recommendations to the Secretary on the operation of Glen Canyon Dam for water year 2017.

### WY 2017 Hydrograph

The second portion of the presentation will cover a brief review of the 2016 Hydrograph and an overview of the upcoming 2017 Hydrograph. In cooperation with the other federal agencies, Reclamation is developing a recommendation for the 2017 Hydrograph. The initial proposed 2017 Hydrograph for Glen Canyon Dam is the same as the 2016 Hydrograph that was unanimously approved by AMWG in August 2015. The proposal to be presented to the TWG in June is as follows:

- Annual Release Volumes will be determined by the 2007 Interim Guidelines and shall be reviewed and adopted through the normal annual operating plan process (in consultation with the Basin States as appropriate).
- Monthly Release Volumes are anticipated to shift depending upon: (1) the projected Annual Release Volume, (2) powerplant capacity, and (3) the magnitude of a potential High Flow Experiment.
- Monthly Release Volumes may vary within the targets identified below. Any remaining monthly operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by the 1996 ROD and contained in the 1995 FEIS and in compliance with all applicable NEPA compliance documents (HFE EA, NNFC EA, 2007 IG). Monthly release volumes proposed in this hydrograph will not affect operating tier determinations for Lakes Powell and Mead under the 2007 Interim Guidelines.
- Release objective for June is:
  - 600 to 650 kaf for annual releases below 9.0 maf
  - 800 kaf for annual releases of 9.0 maf to less than 9.5 maf
  - 900 kaf for annual releases of 9.5 maf to less than 10 maf
  - Greater than 900 kaf for annual releases 10 maf and greater
- Release objective for August is:
  - 800 kaf for annual releases below 9.0 maf
  - 900 kaf for annual releases of 9.0 maf to less than 10 maf
  - Greater than 900 kaf for annual releases 10 maf and greater
- Release objective for September is:
  - 600 kaf for annual releases below 9.0 maf
  - 700 kaf for annual releases of 9.0 maf to less than 10.0 maf
  - 800 kaf or greater for annual releases of 10.0 maf or greater; up to powerplant capacity for high equalization releases
- Monthly Release Volumes will generally strive to maintain 600 kaf levels in the shoulder months (spring and fall) and 800 kaf in the December/January and July/August timeframe.

Additionally, the Bureau of Reclamation will continue to apply best professional judgment in conducting actual operations and in response to changing conditions throughout the water year. Such efforts will continue to be undertaken in coordination with the DOI/DOE agencies, and in consultation with the Basin States as appropriate, to consider changing conditions and adjust projected operations in a manner consistent with the objectives of these parameters as stated above and pursuant to the Law of the River.

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Form**  
**May 25, 2016**

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Agenda Item

Federal Advisory Committee Act Overview: FACA 101 – Managing People and Process

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Purpose

This overview of the Federal Advisory Committee Act (FACA) is designed to help AMWG members better understand the Act under which they are organized, their role, and their purview; facilitate discussion among them; and assist them in making recommendations to the Secretary.

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Action Requested

Information item only.

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Presenter

Jill Nagode, FACA Group Federal Officer, Bureau of Reclamation

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Previous Action Taken

By AMWG:

During the February 2016 AMWG meeting, a presentation was made regarding the recently completed Assessment Report. One recommendation from the report was that an orientation be provided for AMWG members, to ensure at least a minimum level of understanding on the many issues that the group addresses. That recommendation was generally agreed to by the group, and this overview is part of that orientation.

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Relevant Science

N/A

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Summary of Presentation and Background Information

Jill Nagode, Bureau of Reclamation Group Federal Officer, has prepared a brief overview of the Federal Advisory Committee Act (FACA) that includes fundamental information regarding laws and regulations that apply to Federal advisory committees established within the executive branch. More topics of her presentation include how Federal advisory committees are renewed; charter amendments; how Federal advisory committees are managed; roles and responsibilities; how to ensure a fairly balanced membership; meeting and record keeping requirements/procedures; public access to discussion, deliberations, records, and documents; opportunity for the public to provide, at a minimum, written comments; and how to provide collective advice and recommendations to the Secretary of the Interior.

The presentation by Ms. Nagode will provide guidance to those who are new to the field of committee management, as well as an overview for those who have served on the AMWG Federal advisory committee. Topics specific to AMWG will be covered throughout the presentation.

**Glen Canyon Dam Adaptive Management Work Group**  
**Agenda Item Form**  
**May 25, 2016**

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Agenda Item

Law of the River Overview

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Purpose

This overview of the various legal authorities that govern the Colorado River and operations of Glen Canyon Dam is designed to help facilitate discussion among AMWG members and assist them in making recommendations to the Secretary.

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Action Requested

Information item only.

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Presenter

Rod Smith, Attorney-Advisor, Office of the Solicitor, Division of Water Resources, U.S.  
Department of the Interior

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Previous Action Taken

By AMWG:

During the February 2016 AMWG meeting, a presentation was made regarding the recently-completed Assessment Report. One recommendation from the report was that an orientation be provided for AMWG members, to ensure a minimum level of understanding on the many issues that the group addresses. That recommendation was generally agreed to by the group, and this overview is part of that orientation.

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Relevant Science

N/A

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Summary of Presentation and Background Information

This presentation will provide an overview of the various legal authorities that govern both the overall use of the Colorado River and the specific aspects of Colorado River activities associated with Glen Canyon Dam. More general topics will include use of the Colorado River between the United States and Mexico and use between the Upper Basin and Lower Basin. Topics specific to Glen Canyon Dam operations will include the role of the Colorado River Storage Project Act of 1956, the Colorado River Basin Project Act of 1968, and the Grand Canyon Protection Act of 1992.