



Linda Whetton

Albert Sr., Carleton; Alston, Joe; Barger, Mary; Beckmann, Darryl; Begay, Steven; Berry, Charley; Gold, Rick; Groseclose, Jay; Harris, Christopher; Jackson Kelly, Loretta; James, Leslie; Johnson, Rick; King, Robert; Kuharich, Rod; Kuwanwisiwma, Leigh; Lehr, Phillip; Limbaugh, Mark; O'Brien, John; Oelschlaeger, Max; Orton, Mary; Ostler, Don; Palmer, Clayton; Persons, Bill; Peterson, Randall; Potochnik, Andre; Rampton, Ted; Ramsey, Nikolai; Seaholm, Randy; Shields, John; Skrzyński, LeAnn; Spiller, Sam; Steffen, Mark; Steffen, Tim; Strong, Dennis; Taubert, Bruce; Warren, Brad; Werner, Bill; Yeatts, Michael; Zimmerman, Gerald

**Date:** 10/6/2006 8:56:11 AM

**Subject:** Two Items: TWG Meeting Date & Materials for AMWG Meeting

**TWG Members:**

This is to inform you the TWG Meeting Date is set for November 8-9 in Phoenix, Arizona. Attempts were made to hold it during the week of Oct 30-Nov 3 but the conference rooms at the Bureau of Indian Affairs were unavailable and the Holiday Inn Express couldn't provide a block of rooms for that week. With the elections on November 7, it was determined that the best dates to hold the meeting would be Nov 8-9. We also took into consideration the request of one stakeholder who cannot provide any representation at the meeting.

**AMWG Members:**

In scheduling the meeting for Nov 8-9, it will impact when pre-meeting materials can be sent to you. At this point in time, they will be sent via overnight on November 14 which should allow you 13 business days, rather than the usual 30 calendar days, to review them prior to the meeting on December 5-6.

**Roles Ad Hoc Group:**

Mr. Limbaugh, the Secretary's Designee, is interested in finalizing and implementing the roles report. Since the AMWG has new leadership and many new members, it would be worthwhile to get a fresh perspective of the roles report from an updated Ad Hoc Group. Mr. Limbaugh has asked that the Roles Ad Hoc Group be reconstituted to review the work of the earlier group and send him a recommendation as soon as they can.

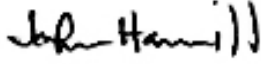
Additional details for both meetings will be forthcoming as arrangements are finalized.

cc: Amy Heuslein / **CC:** Andersen, Matthew; Balsom, Janet; Beard, Chris; Bryant, Garry Cantley (via fax @ 602-379- Nora; Burke, Kelly; Burton, Gary; Christensen, Kerry; Conrad, 3833) Tara; Daly, Karen; Damp, Jonathan; Davis, William E.; Dongoske, Kurt; English, Jeff; Fairley, Helen; Garrett, L. David; Greiner, Lloyd; Hamill, John; Henderson, Norm; Hower, Jonne; Jessop, Shirla; Kaplinski, Matt; Kite, John; Knowles, Glen W.; Kubly, Dennis; Maul, Susan; McMullen, Ken; Melis, Ted; Powell, Linda; Rogers, Roland; Stevens, Larry

**United States**

August 17, 2006

**To:** Rick Gold, Director, Upper Colorado Bureau of Reclamation  
Mark Limbaugh, Assistant Secretary, Water and Science, Department of Interior

From: John Hamill, Chief, GCMRC   
Dave Garrett, Science Advisors, Executive Director

Subject: Request to Delay AMWG Fall Meeting Until Early November

This is a request to delay the fall AMWG meeting from October, 2006, to early November, 2006. The request is presented to provide more time for Glen Canyon Dam Adaptive Management Program (AMP) stakeholders to review and discuss the potential resource impact assessments related to several long experimental options that are being evaluated.

The GCMRC, in collaboration with the AMP Science Planning Group (SPG), has evaluated six different experimental options, and recently reduced these to three options. Their potential impacts to various resources in the Colorado River ecosystem are being contrasted to the impacts from the current baseline flow regime (MLFF), as well as against each other. Information on potential resource impacts, while limited and constrained by uncertainties, is critical to AMWG in its evaluation and selection of an experimental alternative for the FY 2008-2011 period.

The SPG and GCMRC have completed specification of the proposed experimental options and have contracts established for development and review of the assessments for each option. These assessments can be completed by September 30, 2006, but this does not leave sufficient time for TWG or AMWG review and briefings on the assessments prior to a mid-October AMWG meeting. The request to delay the AMWG meeting to early November will provide sufficient time.

Please let us know in the earliest time frame if this request is approved.

**From:** Linda Whetton  
**To:** Albert Sr., Carleton; Alston, Joe; Beckmann, Darryl; Begay, Steven; Bullets, Charley; Dongoske, Kurt; Gold, Rick; Groseclose, Jay; Jackson Kelly, Loretta; James, Leslie; Kuharich, Rod; Kuwanwisiwma, Leigh; Lehr, Phillip; Oelschlaeger, Max; Potochnik, Andre; Rampton, Ted; Ramsey, Nikolai; Shields, John; Spiller, Sam; Steffen, Mark; Strong, Dennis; Taubert, Bruce; Warren, Brad; Werner, Bill; Zimmerman, Gerald  
**Date:** 10/16/2006 11:28:03 AM  
**Subject:** AMWG Meeting Details & Request for Review of POAHG website

This is to inform you the next meeting of the Glen Canyon Dam Adaptive Management Work Group will be held:

Date: Tue., December 5, 2006 (9:30 AM - 5 PM)  
Wed., December 6, 2006 (8 AM - 3 PM)

Location: Fiesta Inn Resort (Encantada Ballroom)  
2100 S. Priest Drive  
Tempe, Arizona 85282  
Tel: 800-528-6481  
Rate: \$103 + tax (12.07%)  
BLOCK CLOSURES: November 13, 2006  
ROOM BLOCK under: Bureau of Reclamation  
CANCELLATION POLICY = 48 hours prior to arrival date or incur first night's lodging rate  
AIRPORT SHUTTLE SERVICE = 24 hours (go to baggage claim area at Sky Harbor Airport)

NOTE: You will be expected to leave a valid credit card or cash deposit in the amount of \$50 with the hotel at the time of check in. This is an "incidentals" charge to cover food/beverage purchases, laundry needs, etc.

There is a restaurant located in the hotel and other restaurants (5-minute walk to Denny's) and some located near the Arizona Mills Mall (5-10 minute drive). If you want more details on the hotel, please visit the website at:

<http://www.fiestainnresort.com>

As indicated in my 10/6/06 e-mail message, meeting packets will be sent via overnight mail on Tuesday, Nov. 14, which will give you 13 business days to review the documents. However, documents that may be revised following the TWG meeting (Core Monitoring Plan, Strategic Science Plan) will be available in their original format on the TWG website should you desire to get a "head start" on reading some of them. Once the documents are posted to the AMWG meeting page, the URL will be provided to you. We are in the process of preparing a draft agenda and will send that out once it has been approved.

REQUEST FOR REVIEW OF PUBLIC OUTREACH AHG (POAHG) WEBSITE:

The new POAHG is in its final draft form and ready to be reviewed by the AMWG and TWG. Please read the following guidelines prior to going to the website.

The URL to the site is: <http://www.gcdamp.gov>  
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Review Guidelines for AMWG/TWG:

- 1) Please review this site with an understanding that it has been extensively reviewed and approved by the Public Outreach Ad Hoc Group. Therefore, any suggested modifications should only be to correct information errors, typos, broken links, or other problems. Stylistic or editorial suggestions are not being sought.
- 2) Please review this site from the perspective of the intended broad public audience.
- 3) Please note the "Alert" message that comes up when going to the new site's home page. It is important that the URL to the site NOT be distributed to anyone OR linked to from any agency web site until the review period is over and the site is officially approved and made public. (The "Alert" message will be removed after the final AMWG and TWG review period.)
- 4) **Please provide all feedback for necessary modifications by November 27th to Mike Yeatts and Jeff Humphrey. (Mike = [michael.yeatts@nau.edu](mailto:michael.yeatts@nau.edu)) (Jeff Humphrey = [jeff\\_humphrey@fws.gov](mailto:jeff_humphrey@fws.gov))**
- 5) The look and feel and functionality of the web site was approved at the March 2006 AMWG meeting. Please review the web site's content carefully by November 27th so it can be approved at the December 5&6 AMWG meeting.
- 6) This web site can accommodate future expansion/additional information as appropriate.

Thank you.

cc: Amy Heuslein / Garry Cantley (via fax @ 602-379-3833)

**CC:** Andersen, Matthew; Balsom, Janet; Barajas, Federico; Barger, Mary; Baron, Jill; Beard, Chris; Bryant, Nora; Burke, Kelly; Burton, Gary; Carroll, Stacey; Christensen, Kerry; Conrad, Tara; Daly, Karen; Damp, Jonathan; Davis, William E.; Fairley, Helen; George, Roxane; Gonzales, Catherine; Greiner, Lloyd; Hamill, John; Harris, Christopher; Henderson, Norm; Hendrix, Doug; Hower, Jonne; Iams, Lisa; Jessop, Shirla; Johnson, Rick; Kaplinski, Matt; Kincaid, Chris; King, Robert; Kite, John; Knowles, Glen W.; Kubly, Dennis; Luckey, April; McMullen, Ken; Melis, Ted; O'Brien, John; Orton, Mary; Ostler, Don; Palmer, Clayton; Persons, Bill; Peterson, Randall; Powell, Linda; Rogers, Roland; Seaholm, Randy; Skrzyński, LeAnn; Steffen, Tim; Stevens, Larry; Wirth, Barry; Yeatts, Michael

**From:** Linda Whetton

**To:** Barajas, Federico; Beckmann, Darryl; Conrad, Tara; Dongoske, Kurt; Gold, Rick; Hamill, John; Hower, Jonne; Kubly, Dennis; Melis, Ted; Orton, Mary; Peterson, Randall

**Date:** 10/25/2006 9:44:42 AM

**Subject:** PLEASE READ: Change in AMWG Pre Mtg Conf Call

The Glen Canyon Dam Adaptive Management Pre-Meeting Conference Call has been changed to:

**Date:** Friday, November 17

**Time:** 1 PM (Washington DC time)  
11 AM (AZ, UT time) -> Daylight savings ends Oct. 29  
10 AM (NV time)

**Duration:** approximately 2 hours

**Phone Numbers:** 1-801-524-3885 or toll free 1-888-420-6860

**For UC Regional Staff:** Please meet in Conference Room 7103

**CC:** Bryant, Nora; Daly, Karen; Hendrix, Doug; Wirth, Barry

**From:** Linda Whetton  
**To:** Albert Sr., Carleton; Alston, Joe; Beckmann, Darryl; Begay, Steven; Bullets, Charley; Dongoske, Kurt; Gold, Rick; Groseclose, Jay; Jackson Kelly, Loretta; James, Leslie; Kuharich, Rod; Kuwanwisiwma, Leigh; Lehr, Phillip; Mershon, Laurie; Oelschlaeger, Max; Orton, Mary; Potochnik, Andre; Rampton, Ted; Ramsey, Nikolai; Shields, John; Spiller, Sam; Steffen, Mark; Strong, Dennis; Taubert, Bruce; Warren, Brad; Werner, Bill; Zimmerman, Gerald  
**Date:** 11/30/2006 1:03:58 PM  
**Subject:** Revision to Exp Options Assessment Report

John Hamill asked me to send the following e-mail message to you. Copies will be provided at the AMWG meeting for inclusion in your meeting binder:

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From: <jhamill@usgs.gov>  
To: <lwhetton@uc.usbr.gov>, <dkubly@uc.usbr.gov>, <kdongoske@cableone.net>  
Date: 11/30/2006 12:15:49 PM  
Subject: Fw: changes to the experimental option report

Linda, Dennis and Kurt: Please distribute this to the TWG and AMWG as appropriate.

The experimental option assessment report that was distributed to the AMWG and is posted on the AMWG website includes several changes from the version that was provided to the TWG. There was one substantive change to the experimental options document in response to address a typographical error. The change appears in chapter 3, part 4 (Recreation and Cultural Resources) under the section entitled Angling Opportunity, Quality, and Access. The edit involved changing 25,000 cfs to 15,000 cfs in the first sentence below and breaking a longer sentence in the original into two shorter sentences. The new paragraph now reads:

Under the 8.23 MAF annual release scenario, flows at or above 15,000 cfs are more frequent under Option A than under MLFF. This situation also holds true for the most probable and wet hydrologic scenarios; although, the differences between frequency of high flows eventually disappears in the wettest of the wet years, when steady high flows at or above 25,000 cfs are required under all the options.

Other than that change, table 3 in appendix E was reformatted so that the tables would not be broken between two pages (page 173 in the original) and the entire document was repaginated to account for several poorly placed page breaks.

I apologize for any confusion this may have caused.

John Hamill, Chief  
Grand Canyon Monitoring and Research Center  
U. S. Geological Survey  
2255 N Gemini Dr. MS 9394  
Flagstaff, AZ 86001  
voice: 928-556-7364  
fax: 928-556-7092  
cell: 928-607-5253

**cc: Amy Heuslein / Garry Cantley (via fax @ 602-379-3833)**

**CC:** Alberts, Jason; Andersen, Matthew; Balsom, Janet; Barger, Mary; Beard, Chris; Bryant, Nora; Burke, Kelly; Burton, Gary; Christensen, Kerry; Conrad, Tara; Crist, Dena; Damp, Jonathan; Davis, William E.; Fairley, Helen; Garrett, L. David; Greiner, Lloyd; Hamill, John; Hamilton, Lynn; Harris,

Christopher; Henderson, Norm; Jessop, Shirla; Johnson, Rick; Kaplinski, Matt; Kincaid, Chris; King, Robert; Kite, John; Knowles, Glen W.; Kubly, Dennis; McMullen, Ken; Melis, Ted; O'Brien, John; Ostler, Don; Palmer, S. Clayton; Persons, Bill; Peterson, Randall; Powell, Linda; Rogers, Roland; Ryan, Tom; Seaholm, Randy; Skrzynski, LeAnn; smankiller; Steffen, Tim; Stevens, Larry; Yeatts, Michael

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**Date:** 12/15/2006 12:32:26 PM  
**Subject:** AMWG Action Items & Motions

The following action items and motions were captured from the AMWG meeting held on Dec. 5-6, 2006:

### **ACTION ITEMS**

1. Members should send their comments on the AMP Strategic Plan to Mary Orton by March 1, 2007. Four documents are attached that chronicle the dates that AMWG either internally approved the Strategic Plan, or recommended it to the Secretary of the Interior:
  - a. The motion that the AMWG passed on January 17, 2002, recommending the strategic plan to the Secretary of the Interior: <2002-01 Action taken on the SP by AMWG.doc>. This included the vision, mission, principles, goals, management objectives, qualitative targets, and narrative sections.
  - b. The text of the strategic plan that AMWG recommended to the Secretary on January 17, 2002: <\_Strategic Plan as recommended to SOTI 2002-01-17.PDF>.
  - c. Amendments to the strategic plan approved by AMWG in January 2003, along with some agreements on process to complete the strategic plan: <2003-01 Action taken on the SP by AMWG.doc>. AMWG did not recommend these amendments to the Secretary.
  - d. Amendments to the strategic plan, including Information Needs in sequence order, approved "as a working document" by AMWG (not recommended to the Secretary): <2003-08 Action taken on the SP by AMWG.doc>.
2. The Roles Ad Hoc Group (Randy Peterson, USBR; John Hamill, GCMRC; Dave Garrett, SAs; and Kurt Dongoske, TWG Chair) will review the Roles Ad Hoc Group Report (attached: <roles report final 2006-01.doc>), and will address the Science Advisors' functional recommendations from the Executive Summary of the SPG Report (attached: <roles report final 2006-01>).
3. Members should provide feedback to Dennis Kubly on the following FY08 budget development questions by December 31, 2006. For more information, see the FY08 Budget Development Agenda Information Form from the December 2006 AMWG meeting packet (attached: < FY08 budget final .doc >).

### **MOTIONS to be forwarded to the Secretary of the Interior:**

- Recommend to the Secretary of the Interior to accept the GCMRC Strategic Science Plan dated October 27, 2006.
- AMWG approves the Monitoring and Research Plan (MRP) as a working document to help guide preparation of the FY08-09 workplan and budget; and recommends to the Secretary of the Interior the GCMRC be charged with (1) addressing the concerns listed in the TWG Minority report in a final FY07-11 document, and (2) bringing that document to the AMWG for further consideration in summer 2007.
- AMWG recommends that the Secretary of the Interior consider the following scope in developing the Long Term Experimental Plan EIS:



The alternatives should maintain the balance of benefits to all resources as described in the ROD of the Glen Canyon Dam EIS, while focusing on humpback chub and sediment resources. Insofar as they are consistent with this balance and focus, the elements of the alternatives should:

- include a range of flow events, patterns, and timing
- include non-flow experiments
- be based on credible science planning
- maximize hydropower capacity and flexibility to the extent possible
- address tribal and cultural resources.

The experiments in the plan should be of adequate (but not excessive) duration to allow the determination of actions needed to sustain and, where possible, improve key resources and the balance of benefits to all resources.

The AMWG also forwards to the Secretary for consideration, four options<sup>1</sup> and the Modified Low Fluctuating Flow regime from the Glen Canyon Dam EIS ROD, as examples of mixtures of flow and non-flow experiments that have been rigorously debated within the Glen Canyon Dam Adaptive Management Program.

<sup>1</sup> GCMRC, 2006, Assessment of the Estimated Effects of Four Experimental Options on Resources below Glen Canyon Dam, table E.1, page 3. USGS, Flagstaff.

- AMWG recommends to the Secretary of the Interior to charge GCMRC to develop a science plan for a BHBF that addresses the concerns raised at the AMWG meeting on Dec. 6, 2006, and AMWG further charges the TWG to work with GCMRC to review the Draft Science Plan and make a recommendation to the AMWG.
- AMWG recommends that the Secretary of the Interior approve as final the content of the public outreach website at [www.gcdamp.gov](http://www.gcdamp.gov); and that the Secretary approve the proposed Website Modification Process for determining what future content or materials for posting to the site need AMWG review and approval; and that the Secretary approve the following five fact sheets as final for public distribution:
  1. Lees Ferry Trout Fishery
  2. Historical Native Fishes of Glen and Grand Canyons
  3. Glen Canyon Dam Temperature Control Device
  4. Endangered Species
  5. Sand Bars in the Grand Canyon Recovery Implementation Program
- Because the lack of a recovery program for the humpback chub is impeding the progress of the GCDAMP, AMWG recommends that the Secretary of the Interior charge the Fish and Wildlife Service to lead the development of a Lower Colorado River fish recovery implementation program (LCRRIP), to include the humpback chub in Marble and Grand Canyons, by the end of 2008.
- The AMWG recommends that the Secretary of the Interior support development of refuges to assist in the conservation of the Grand Canyon population of humpback chub. Developing these refuges needs to be a collaborative effort, among the actions taken for this conservation. Further development and operation of refuges should be led under the auspices of a lower Colorado River fish recovery implementation program when this program is underway.

cc: Amy Heuslein / Garry Cantley (via CD)

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**Date:** 11/2/2006 2:42:36 PM

**Subject:** Memo from AS-WS Limbaugh to AMWG

Please see attached memo from Mr. Mark Limbaugh.

cc: Amy Heuslein /Garry Cantley (via fax @ 602-379-3833)

**CC:** Alberts, Jason; Andersen, Matthew; Barajas, Federico; Barger, Mary; Conrad, Tara; Fairley, Helen; Garrett, L. David; George, Roxane; Gonzales, Catherine; Hamill, John; Harris, Christopher; Hower, Jonne; Jessop, Shirla; Johnson, Rick; King, Robert; Kubly, Dennis; Lee, Leona; Melis, Ted; Mershon, Laurie; O'Brien, John; Orton, Mary; Ostler, Don; Palmer, Clayton; Persons, Bill; Peterson, Randall; Powell, Linda; Seaholm, Randy; Skrzynski, LeAnn; Steffen, Tim; Stevens, Larry; Yeatts, Michael

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## **Action Taken on the Strategic Plan by the AMWG**

**January 17, 2002**

1. Add to the Strategic Plan in Chapter 1, in the section "Adaptive Management Program Organizational Framework," subsection "Glen Canyon Dam Adaptive Management Program Defined," top of page 2, second bullet:
  - "The AMP evaluates how well the preferred alternative of the EIS/ROD and other management actions meet the goals of the GCPA and the mix of resource benefits in the EIS/ROD."
2. On the bottom of page 4, in the section "Adaptive Management Program Organizational Framework," subsection "Organizations and Positions With the Glen Canyon Dam Adaptive Management Program," under the heading "Adaptive Management Work Group," second set of bulleted items; change "Wyoming Interstate Streams Engineer" to "Wyoming State Engineer's Office."
3. Referred to the Ad Hoc Committee on Strategic Planning (AHCSP) the development of a process and timeline for the following, in order to complete the Strategic Plan: prioritization, MAs and INs, and identification of which MOs are in and which are out of the AMP. The AHCSP is to take its recommendation to the TWG before reporting to the AMWG at its next meeting.
4. Referred to the Ad Hoc Committee on Strategic Planning (AHCSP) consideration of the addition of a new Management Objective 7.3. Maintain suitable water quality in GCD releases to meet downstream Management Objectives. The AHCSP is to take its recommendation to the TWG before reporting to the AMWG at its next meeting.
5. Recommended to the Secretary of the Interior to accept the Strategic Plan (vision, mission, principles, goals, management objectives, qualitative targets, and narrative sections) with amendments approved at this meeting. (one abstention, no nay votes)

**At its meeting in January 2003, the AMWG adopted these recommendations with no changes.**

## **MEMORANDUM**

**TO:** Members of the Glen Canyon Dam Adaptive Management Work Group (AMWG)

**FROM:** Members of the AMWG Ad Hoc Committee on What is In and Out of the AMP (AHCIO)  
Randy Seaholm, Chair

Robert Begay	Wayne Cook	Kurt Dongoske	Lloyd Greiner
Norm Henderson	Pam Hyde	Phil Lehr	Don Metz
Clayton Palmer	Bill Persons	Randy Peterson	John Shields

**CC:** AMWG Alternates and interested parties

**RE:** Recommendation for action at your January meeting

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At your April 25, 2002 meeting, you directed the formation of an ad hoc committee, the Ad Hoc Committee on What is In and Out of the AMP (AHCIO), to make a recommendation to you regarding criteria for MOs and INs determined inappropriate for the AMP.

1. The AHCIO recommends to you the adoption of the following criteria to use to determine whether an Information Need is inappropriate for inclusion in the AMP Strategic Plan. An Information Need is inappropriate for inclusion in the AMP Strategic Plan if:
  - A. It contributes nothing to the accomplishment of the Vision and Mission of the AMP.
  - B. It describes how an agency should develop information needed for the AMP, instead of describing information needed for the AMP. (Note: Some Information Needs may need to be re-written if this criterion is accepted by the AMWG.)
2. The AHCIO also recommends to you that each Information Need in the AMP Strategic Plan should eventually be placed into one of three categories:
  - A. Information Needs that are appropriate for funding by power revenues and for accomplishment by the Grand Canyon Monitoring and Research Center (GCMRC).
  - B. Information Needs that may be addressed by the GCMRC but are not appropriate for funding by power revenues.
  - C. Information Needs that are funded and accomplished under the authority of an entity other than the GCMRC.
3. The AHCIO further recommends to you that if there are Information Needs that you decide are not appropriate for funding from power revenues, the proper role of the AMWG is:



- A. To recommend to the Secretary of the Interior that particular Information Needs should be addressed by an agency or agencies under her purview, when that is the case, and
  - B. To assist any agency or agencies that should address the Information Needs to obtain appropriated dollars to fund that work.
4. The AHCIO further recommends that you:
- a. Ask the AHCIO to sort the Information Needs into the three categories listed above under #2, and test the Information Needs to see if any of them meet the criteria listed under #1, above; and
  - b. Ask the TWG to review the results of that work and make a recommendation for action to the AMWG.
5. The AHCIO further recommends that you delete the RINs under MO 12.2 and RIN 6.5.4 from the Strategic Plan, and substitute a narrative. The Information Needs that would be deleted are as follows:

~~RIN 12.2.1 What is the most appropriate field sampling method(s) (e.g., sampling size, spatial and temporal distribution, analysis, explicit assumptions, limitations, and uncertainties) and statistical analysis to monitor the status and trends of resources targeted by management objectives?~~

~~RIN 12.2.2 What remote sensing technologies are available to less intrusively and more cost effectively monitor, characterize and map: (a) the aquatic food base, (b) fish, (c) fish habitat features, (d) Kanab ambersnail habitat, (e) water quality parameters, (f) bathymetry and associated substrates and (g) cultural sites?~~

~~RIN 12.2.3 What digital, or other, technologies exist and should be used to record field observations and spatially reference these data to facilitate their integration into GCMRC databases and use by PIs and stakeholders?~~

~~RIN 12.2.4 What historic data sets currently exist for all resources targeted by management objectives in the GCDAMP?~~

~~RIN 12.2.5 What remote sensing data are available or can be obtained that will support the production of a system wide resource map?~~

~~RIN 12.2.6 What are the acceptable detection levels for change in Colorado River ecosystem resources? How should those levels most appropriately be determined and who should make the determinations?~~

~~RIN 12.2.7 How can GIS be used to designate and stratify habitats to improve system wide extrapolation of population estimates and habitat in the Colorado River ecosystem?~~

~~RIN 12.2.8 Determine accurate, reliable, and standardized methods for measuring erosion at historic sites.~~

~~RIN 6.5.4 How can remote sensing assist in the development of a map of non-native species distributions in the Colorado River ecosystem including characterization of the types of habitat that supports non-native species?~~

The following substitute language would be insert under Management Objective 12.2 (“Attain or improve monitoring and research programs to achieve the appropriate scale and sampling design needed to support science-based adaptive management recommendations.”):

"This MO is intended to encourage continuous improvement in research and monitoring techniques to provide the AMP with the best available science. However, exploration of new techniques and methods should not come at the expense of long-term monitoring and resource protection.

“Unlike the other Management Objectives, this MO reflects an ongoing need to consider new information regarding the most cost-effective and least intrusive techniques and methods available for monitoring and conducting research on the resources of the CRE. GCMRC seeks this information as part of its normal operations, using Protocol Evaluation Panels and other means.”