

## **Appendix #: Adaptive Management Version 9-11-2014**

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### **1. Basis for Adaptive Management**

- a. Defined terms that are capitalized below are as found in the Compact.
- b. The Adaptive Management planning process implements several of the provisions found in the Compact that are specific to FIIP Instream Flows, reservoir storage, and irrigation water management on natural watercourses influenced by, and infrastructure associated with, the Flathead Indian Irrigation Project (FIIP).
- c. Adaptive Management, and the commitments and responsibilities of the Parties and Project Operator to implement Adaptive Management, continue over the life of the Compact.
- d. The Parties understand that implementation of the Adaptive Management planning process represents a substantial commitment of staff and resources.
- e. The Parties understand that Adaptive Management planning shall be conducted at all times based on objective data and sound science.
- f. The Parties understand that outputs from the Adaptive Management planning process are critical for the Tribes, Reservation water users and the public, and the Parties shall, at appropriate times each year, make Adaptive Management outputs available to the public and interested parties. The Parties shall cause a website to be developed for that purpose.
- g. Adaptive Management to implement specific provisions of the Compact is necessitated because:
  - i. The FIIP irrigation infrastructure is intimately interconnected to natural watercourses on the Reservation, and each is best managed using an integrated approach.
  - ii. The definition of FIIP River Diversion Allowances (RDA) to achieve the FIIP Water Use Right varies for wet, normal, and dry Natural Flow water-year types, and this requires flexibility to manage RDA levels each year based on available water supply.
  - iii. FIIP Instream Flows are defined for a FIIP Minimum Enforceable Instream Flow (MEF) level and for FIIP Target Instream Flow levels, which vary for wet and normal Natural Flow water-year types. This requires flexibility to manage FIIP Instream Flows each year based on available water supply.
  - iv. FIIP Reallocated Water is quantified by seasonal volume and incrementally assigned to specific FIIP Instream Flow locations, or split between instream flow and irrigation uses, once FIIP Instream Flows are fully met. This requires project-level technical planning, implementation, and water reallocation on a recurrent basis.

### **2. Adaptive Management Team**

- a. Each Party and the Project Operator shall assign a technical team member, and alternate team member, to the Adaptive Management technical team or "AMT."
  - i. AMT technical team members shall be professionals, with a minimum bachelor's degree and three years of related experience, in one or more of the following water resources fields: water resources management; hydrology; hydrogeology; geology; environmental sciences; biological sciences; or engineering with emphasis on water resources.
- b. The AMT shall form within six months of the date of ratification of the Compact by the State of Montana Legislature.
- c. The Parties understand that a number of the responsibilities of the AMT cannot initiate until settlement appropriations are dedicated to the Compact. However, the Parties and the Project Operator commit to develop the coordination and water co-management responsibilities of the AMT upon the formation of the AMT.

- d. The AMT shall have responsibility to allocate water between instream and irrigation uses of water based on the projected and realized annual water supply. The Parties understand that the AMT may change allocations through the year, based on water supply, seasonal climate, or irrigation management considerations. At all times, the AMT shall allocate water such that they comply with the provisions of the Compact and the articulation of the FIIP MEF and FIIP TIF levels and the FIIP RDA levels, each of which may be uniquely described by water-year type at a particular location.
- e. The AMT shall, from time to time, draw on other staff within or outside of their respective organizations to address technical issues.
- f. The AMT shall comply with applicable Tribal, federal, and State law during all aspects of project planning and implementation.

### 3. Responsibilities and Commitments of the Adaptive Management Team

- a. **Water Measurement** – Adaptive Management, and implementation of specific provisions of the Compact, rely upon comprehensive measurement of water, management of measurement information in a database, and seasonal and longer-term adaptation based on measurement information. Water measurement is a key category of Operational Improvements.
  - i. The AMT shall identify, and plan for, components of a comprehensive measurement program. These shall be phased-in based on access to settlement contributions and/or the priority of implementation of Operational Improvements and Rehabilitation and Betterment.
  - ii. The AMT shall be responsible to ensure that water measurement instrumentation, data collection, and data management follow a rigorous quality assurance protocol, and that all measurement information is of sufficient quality to meet its end use.
  - iii. The AMT shall be responsible to ensure that data management is integrated between the Parties and the Project Operator and that all Parties and the Project Operator have access to data.
  - iv. The AMT shall be responsible to ensure that water measurement information is publically available in a timely manner, and shall cause a website to be developed for that purpose.
  - v. The Tribes shall be responsible to install and maintain water measurement equipment and maintain data management at FIIP Instream Flow, natural stream, and regulated stream locations; reservoirs; FIIP RDA diversion works and FIIP irrigation wasteway locations.
  - vi. The Tribes shall be responsible to ensure that FIIP RDA diversion works measurement data can be reviewed through the irrigation season to ensure compliance with FIIP RDA levels.
  - vii. The Project Operator shall be responsible to install and maintain water measurement equipment and maintain data management at lateral canal diversion works and onfarm diversion locations.
  - viii. The Tribes shall be responsible to produce an annual report of findings for the full water measurement program. This responsibility shall ensue for ten years following the start of the measurement program, at which time the Parties and Project Operator may, at their discretion, identify an alternate party to be the reporting lead.
- b. **Water Management Planning Tools** – The AMT shall develop, or cause to be developed, a suite of water management planning tools, defined below, to support FIIP water management and Adaptive Management. Water management planning tools involve construction of hydrologic or data management and reporting protocols. Water management planning tools are a key category of Operational Improvements. The Parties recognize that the water management planning tools shall be developed as settlement contributions become available, and that these tools may require a multi-year period of refinement to complete. Further, the Parties recognize that water management

planning tools may be developed to follow the priority of implementation of Operational Improvements and Rehabilitation and Betterment.

- i. The AMT shall be responsible to participate in, review, and apply water management planning tools developed by one of the Parties or the Project Operator. Water management planning tools shall be refined until there is concurrence by the AMT that a specific tool is suitable for application.
  - ii. The Tribes shall be responsible to apply hydrologic and meteorological information to objectively define wet, normal, and dry Natural Flow water-year types. The procedure shall be structured to provide definition of water-year types from late fall into the next year’s irrigation season.
  - iii. The Tribes shall be responsible to develop water supply forecast procedures to plan for and allocate seasonal runoff; forecast procedures shall be developed in tandem with definition of water-year types. Forecast procedures shall be developed to provide long-range (fall season), and winter through spring-early summer forecast tools.
  - iv. The AMT shall be responsible to develop operational models or tools to support short-term (weekly to daily) instream flow and irrigation water management. Once developed, the Project Operator shall refine and update operational models or tools using input from the water measurement program.
  - v. The Project Operator shall be responsible to develop a water accounting program to store onfarm water measurement data, track onfarm water use, and provide this information to FIIP water users and the AMT.
- c. **Water Management Coordination** – The AMT shall commit to an extensive coordination process to implement provisions of Adaptive Management. The AMT agrees, upon formation of the AMT, to meet at a minimum at the frequency defined below, and on an as-needed basis. Through concurrence of the AMT, the frequency of coordination may be relaxed in certain instances.
- i. The AMT agrees to each year rotate the responsibility to schedule, chair, and record water management coordination meetings, with the Tribes assigned responsibility in year one of the process.

Approximate date	Meeting output
End of January	Review reservoir carryover and initial projection of water supply, tentatively categorize water-year type
End of February	Review reservoir carryover and initial projection of water supply, tentatively categorize water-year type, set March wet and normal year streamflow targets, modify MEF timing (if applicable) to match anticipated snowmelt runoff
End of March	Refine projection of water supply, tentatively categorize water-year type, and set April wet and normal streamflow targets, modify MEF timing (if applicable) to match anticipated snowmelt runoff
Mid-April	Refine projection of water supply, categorize water-year type, update wet and normal streamflow targets for month, set initial RDA, modify MEF timing (if applicable) to match anticipated snowmelt runoff
Early May	Refine projection of water supply, update water-year type, set wet and normal streamflow targets for month, review initial RDA, modify MEF timing (if applicable) to match anticipated snowmelt runoff
Mid-May	Refine projection of water supply, update water-year type, update wet and normal streamflow targets for month, update RDA, modify MEF timing (if applicable) to match anticipated snowmelt runoff
Early June	Refine projection of water supply, update water-year type, set wet and normal streamflow targets for month, accumulate RDA to date, modify MEF timing (if applicable) to match anticipated snowmelt runoff
Mid June	Finalize projection of water supply and water-year type, update wet and normal streamflow targets for month, evaluate RDA, modify MEF timing (if applicable) to match anticipated snowmelt runoff

Early July	Set wet and normal streamflow targets for month, evaluate RDA, accumulate RDA to date
Mid July	Update wet and normal streamflow targets for month
Early August	Set wet and normal streamflow targets for month, evaluate RDA, accumulate RDA to date
Early September	Set wet and normal streamflow targets for month, accumulate RDA to date
Early October	Discuss annual reporting and water operations for previous year, develop long-range forecast based on climatic indicators
Early December	Finalize annual reporting of water measurement, develop long-range forecast based on climatic indicators

- d. **Within-Year Water Management Planning and Allocation** – Within-year water management planning encompasses a suite of decisions the AMT shall make to allocate water between instream flows and irrigation uses of water. At all times, the AMT shall allocate water such that they comply with the provisions of the Compact and the articulation of the FIIP MEF and FIIP TIF levels and the FIIP RDA levels, each of which may be uniquely described by water-year type at a particular location.
- i. The AMT shall define FIIP TIF levels (if applicable in a year) and FIIP RDA levels following the coordination schedule in Section 4.c above. The AMT may modify these levels through the planning period based on water supply, climate, or irrigation management conditions.
  - ii. The AMT may agree to modify FIIP MEF levels by moving the FIIP MEF schedule for a month either forward in time one month or backward in time one month. The procedure is only applicable in the March through July time period.
  - iii. After the water management planning tools in Section 4.b.ii-iii, above, have been constructed and applied, the AMT may agree to modify the FIIP MEF levels by adjusting to weekly FIIP MEF levels, which cumulatively equal the monthly FIIP MEF volume for the month for which this procedure is applied. This procedure is only applicable in the March through July period.
  - iv. The AMT shall be responsible to define the initiation of Drought and the cessation of Drought, where Drought is as defined in the Compact. The AMT shall be responsible to communicate this information to affected parties and the public.
  - v. The AMT shall be responsible to implement the Shared Shortages provisions that are set forth in Article IV.# of the Compact.
- e. **Operational Improvements** – The AMT shall be responsible to prioritize, plan for, and implement FIIP Operational Improvements, which are defined in Appendix #.
- i. The AMT shall be responsible to prioritize implementation of Operational Improvements, defined in Appendix #, based on the pace of settlement contributions, experience implementing Operational Improvements, and other factors.
  - ii. The AMT shall be responsible to plan for, design, and complete environmental and engineering review of Operational Improvements, with lead responsibilities identified below.
    1. Water measurement responsibilities are defined in Section 4.a.
    2. Water management planning tool responsibilities are defined in Section 4.b.
    3. Stockwater mitigation and management planning and project prioritization is a shared responsibility of the AMT. The State of Montana and Project Operator shall be the lead to implement stockwater mitigation projects.
    4. The Tribes shall be the lead to cause infrastructure upgrades which are considered Operational Improvements to be implemented.
- f. **Rehabilitation and Betterment** - The AMT shall be responsible to prioritize, plan for, and implement FIIP Rehabilitation and Betterment actions, which are defined in Appendix #.

- i. The AMT shall be responsible to plan for, design, and complete environmental and engineering review of Rehabilitation and Betterment actions, with lead responsibility identified below.
  - ii. The Tribes shall be the lead to cause infrastructure upgrades which are considered Rehabilitation and Betterment actions to be implemented.
- g. **FIIP Reallocated Water from Operational Improvements and Rehabilitation and Betterment**
- i. The AMT shall develop either a direct measurement approach or an analytical calculation approach to determine the seasonal volume of water saved through implementation of each Operational Improvement and/or Rehabilitation and Betterment project.
    - 1. The Tribes shall be responsible, in consultation with the AMT, to complete measurement activities to determine the magnitude of Reallocated Water.
    - 2. The Tribes shall be responsible, in consultation with the AMT, to complete analytical calculations to determine the seasonal volume of water saved through implementation of each Operational Improvement and/or Rehabilitation and Betterment project, in those instances where direct measurement is not employed.
    - 3. The Tribes shall be responsible to develop a reallocation report for each Operational Improvement and/or Rehabilitation and Betterment project. Each reallocation report shall be submitted to the Project Operator and Office of the Engineer.
    - 4. The reallocation report shall, at minimum, describe:
      - a. the Operational Improvement and/or Rehabilitation and Betterment project, or other actions, that form the basis for Reallocated Water;
      - b. the seasonal magnitude of Reallocated Water;
      - c. the FIIP Instream Flow or FIIP RDA location to assign reallocated water to;
      - and
      - d. water requirements for resource mitigation.
  - ii. Upon completion of each reallocation report, the FIIP Instream Flow values shall be incrementally increased. After those are fulfilled, Reallocated Water shall be split equally between the Tribes' Instream Flows and the FIIP RDA's.
  - iii. The AMT shall be responsible to maintain a complete record of reallocation reports and supporting information.
  - iv. The AMT shall be responsible to maintain a tracking database to record changes in FIIP Instream Flows and FIIP RDA levels attributable to FIIP Reallocated Water.
  - v. Resource mitigation includes actions or amounts of water that are required to avoid adverse effect to either the Tribal Water Right or Water Rights Arising Under State Law.
    - 1. In all circumstances, resource mitigation requirements shall be based on water measurement or analytical calculation approaches applied for a particular Operational Improvement and/or Rehabilitation and Betterment Project.
    - 2. Where an amount of water is required for resource mitigation, the water may come from Reallocated Water or in certain circumstances other sources of water.
    - 3. Where there are costs associated with resource mitigation, the cost shall come from the overall cost for the Operational Improvement and/or Rehabilitation and Betterment project.
- h. ***[To be discussed – AMT responsibility to define when Operation Improvement and Rehabilitation and Betterment Benchmarks are met]***