

**ARIZONA WATER SETTLEMENTS ACT
PROPOSAL FOR STREAM DIVERSION IMPROVEMENTS
TIER 2**

**Submitted by
GILA NATIONAL FOREST
Silver City**

**Submitted to
STATE OF NEW MEXICO
INTERSTATE STREAM COMMISSION**

December 14, 2011

INTRODUCTION

This Tier 2 proposal for stream diversion improvements is a revision of the October 31, 2011 preliminary proposal. There are two significant differences in this revision: 1) one diversion ditch (Balke Ditch) is now proposed for improvement 2) the feasibility portion of this work includes provision to evaluate both whether any type of new construction will be superior to the existing push-up structure, and which of several types of improvements may be optimal for the particular location.

This is essentially a proposal for a demonstration project. If the proposed feasibility study indicates the viability of an alternative to the push-up structures now being employed, then this proposal recommends that additional funds be made available for construction. Other ditch owners have similar ditch issues, and it is expected that a successful project would stimulate additional interest on NFS lands.

If the feasibility study indicates that physical changes to the existing push-up diversion may not be practical because of unstable bed or banks, inordinate length, cost, or environmental issues, other alternatives will be evaluated, such as collection galleries (eg., Ranney wells), shallow water screens, or wells. No construction would take place until the results of the feasibility study are available to decision makers.

1. [570] If the proposal would extend the water supply through conservation, or increase the supply through development of new water,
 - a. Describe the location and verify the ownership of and legal access to lands related to the proposal. [0 to 30 points]

The Balke Ditch is located on the San Francisco River Location is shown in Attachment 1. The Ditch and conveyance system are entirely on National Forest lands managed by the Gila National Forest (Attachment 2). The Balke Ditch water rights holder, Mr. Ed Miller, supports this effort (Attachment 3).

- b. Identify the source of the water to be put to use. [0 to 10 points]

San Francisco River, a major tributary to the Gila River within Catron County, NM with tributaries in Grant Co.

- c. Describe and quantify whether and how the proposal would extend the water supply through conservation, or increase the supply through development of new water in the Southwest Planning Region. [4 points for each 10 AF up to 500 points]

This proposed work is intended to extend the water supply through conservation.

Current Conditions

The Balke Ranch is now owned by Mr. Ed Miller. There are 18.4 acres permitted for irrigation on the ranch. The annual diversion from the San Francisco River via the Balke Ditch is 3.5 acre feet per acre (Ed Miller, pers comm.), for a total consumptive use of 64.4 acre feet annually. Diversion usually takes place all year into a pond on the property, and the water is used as needed for irrigation. Unused water returns to the San Francisco River via a spillway in the pond.

The point of diversion is on Forest Service land about ¼ mile upstream of the Ranch. Traditionally, this was a push-up diversion dam of sand and gravel that, according to Mr. Miller, would wash out on a regular basis. This necessitated bringing heavy motorized equipment into the San Francisco River to reestablish the push-up dam. Significant disturbance to the channel bottom, and increases in turbidity and debris result from this work. Pollution from releases of motor oil, gasoline or diesel is always a concern when conducting this work in the active River channel.

Other problems with that type of diversion included siltation in the outlet works (ditch), and the inability to divert at low stream flows without additional berthing work to increase the ponded water level to affect diversion.

Mr. Miller engaged the consultative services of the Forest Service in attempts to rectify some of the problems. Among solutions investigated were 1) a low concrete dam across the channel, 2) a buried perforated pipe below the channel (infiltration gallery), and 3) a rock weir. Some of these analyses will be available for the proposed feasibility study.

The rock weir is currently employed. It consists of large boulders spaced across the channel below the ditch. This raises the water level in the River but does not impound the water. The method works at moderate River flows; at low flows not enough water can be diverted and a push-up diversion needs to be constructed using a backhoe or tractor working in the active River channel.

With Diversion Improvements

With a permanent diversion and better control on the losses from the diversion and ditch system, an increase in diversion efficiency of 30% or more of the total diversion might be anticipated (Colorado High Plains Irrigation Practices Guide, 2004, page 1). Although some of the seepage from unlined ditches will return to the River, it appears (from examination of aerial photos of the area along the River adjacent to the ditch) that much of the seepage may be lost to evapotranspiration before reaching the River.

If this savings percentage can be achieved in this demonstration project, it could result in a net savings of 19 acre feet per year ($64.4 * 1.3$ – consumptive use). A total water budget analysis would need to be conducted during the feasibility study to determine the total possible water savings at this ditch system.

- d. Demonstrate how the proposal would meet AWSA and CUFA requirements. [up to 30 points] (see www.AWSAplanning.com for AWSA and CUFA documents)

The San Francisco River Diversion/Ditches meets AWSA, Consumptive Use and Forbearance Agreement, and other applicable federal, state and local laws. It includes treatments to capture and conserve water for local consumption.

This water conservation project will add to minimum flow requirements under the CUFA, allowing for more water to reach the river systems to offset the consumption of 14,000 acre feet (4,000 acre-feet per year from the San Francisco River) and thereby contribute to the CUFA-required volume of stored water in each given year. (CUFA 12.4.1.2: “*stream flow increases in Arizona resulting from watershed improvements or other water flow enhancement activities funded by the State of New Mexico, and the percentage of such increases that may be added to the Secretary’s ten-year permissible Consumptive Use pursuant to this Agreement*”)

Any stream flow measurements used to monitor this project will use flow measurement of the gauge station located on the San Francisco River near Reserve, New Mexico, and other US Geological Survey or approved designated entity’s flow measurement in compliance with CUFA (CUFA 12.1: *For purposes of the measurement of stream flows, real-time readings by the U.S. Geological Survey, or such other entity as designated by the technical committee for such purpose, shall be used for purposes of determining compliance with Exhibit 2.47 (Terms of New Mexico Diversions)).*

All work associated with this proposal will comply with NEPA (AWSA SEC. 212. (h) (1) ENVIRONMENTAL COMPLIANCE.-*Upon execution of the New Mexico Consumptive Use and Forbearance Agreement and the New Mexico Unit Agreement, the Secretary shall promptly comply with all aspects of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and all other applicable environmental Acts and regulations.*)

2. [40] Describe the proposal and its technical viability.

- a. Include any (or reference publicly-available) technical and engineering studies completed and demonstrate how these studies support the proposal. [up to 20 points]

Please refer to the information provided in Attachments 4 through 8.

The proposal consists of a feasibility study including a field (geotechnical) investigation to ascertain the viability of replacing the existing push-up structure with an alternative. Currently, we anticipate evaluation the following alternatives:

- rock weirs
- low flow dams
- inflatable dams
- infiltration galleries

- shallow water screens
- wells

The feasibility of replacing a push-up diversion with a permanent diversion structure has been investigated in New Mexico (US Army Corps of Engineers [USACE], Attachment 4). The USACE has also determined that this type of work is exempt from Section 404 of the Clean Water Act (Attachment 5).

Rock weirs have the potential of least disturbance to the streambed. Various types are described in Attachment 7. It is recognized that the results of an evaluation of the potential for use of rock weirs on the Gila River in the Cliff area indicated that channel stability, large magnitude flooding, and large flow variability may preclude the use of certain rock weir alternatives in that area (Miller Engineering and D.L. Rosgen; verbal information provided by C. Roepke, ISC). The proposed feasibility study would make use of this information in its analysis of the flow and channel stability at the Balke Ditch location.

Push up structures have been recognized by the State of Oregon (Attachment 6) as having significant enough environmental problems (blocking fish passage, disturbing spawning grounds) that the State has embarked on a plan to replace many of the push up diversions with alternatives. This work is described in Attachment 8.

The following tasks are proposed;

1. Contracting and developing site-specific work plans.
2. Geotechnical investigation, including determining depth to bedrock, alluvial materials description, bank stability, channel gradient, anticipated scour potential.
3. Hydrologic investigation including gradient, flow volume-height-velocity calculations using appropriate HEC models.
4. Biological study of channel area, including analysis of fish barriers.
5. Hydrogeologic study of potential for infiltration galleries and wells to supply irrigation needs.
6. Economic analysis of alternatives having favorable technical potential.
7. Reporting of findings and recommendations.

For the proposed feasibility study, NEPA is not proposed as it is not necessary for this aspect of the project. If the project is deemed feasible, then additional monies would be required to complete NEPA analysis. This would be a future request of additional AWSA dollars.

- b. Include any (or reference publicly-available) hydrologic, ecologic, or geotechnical studies completed and demonstrate how information included in these studies specifically supports or detracts from the proposal. [up to 20 points]

Technical viability and feasibility have been demonstrated through similar projects that have been completed nation-wide, including in remote Forest Service

locations. Additionally, USDA-Natural Resources Conservation Service (NRCS) has technical guides on this topic.

In addition to the information provided in the attachments, work already being conducted by the Forest Service at this location regarding the flow hydrology, channel stability, and ecological considerations,

In 2009, the Glenwood Ranger District utilized Atiq Syed, the Regional Dam/Geotechnical Engineer for the USFS Rocky Mountain Region, to initiate a preliminary site assessment of the Balke Ditch. Due to lack of time and funding, a full assessment was never completed, however Mr. Syed was able to evaluate the area for site potential. The NRSC was also contacted about this site and expressed interest in assisting in the project. They indicated that they would hold out on design support and funding until some additional matching dollars were available to help offset their agency costs.

3. [40] Quantify estimated costs.

- a. Quantify the proposal's estimated costs, including planning, design, and/or construction, and administration or oversight. [up to 10 points]

The estimated costs for conducting the feasibility study are as follows:

Task	Estimated Cost
1	\$ 4,500.00
2	\$ 17,500.00
4	\$ 5,000.00
5	\$ 4,500.00
6	\$ 5,000.00
7	\$ 3,500.00
8	\$ 5,000.00
Total	\$ 45,000.00

- b. If applicable, quantify the proposed project's on-going administrative, operational, and maintenance costs. [up to 10 points]

If the feasibility study shows favorable results, additional funds will be sought for design, construction, and maintenance costs of the chosen diversion method.

- c. Describe environmental compliance activities, and quantify the costs for environmental mitigation and restoration related to the proposal. [up to 10 points]

As the proposed work will entail geotechnical investigation, including boring, sampling and testing, there will be limited and temporary surface disturbance from this field work.

- d. Quantify the AWSA funding sought for the proposal and for the pendency of the proposed activity's or project's duration. [up to 10 points]

For the feasibility study: \$45,000. If the feasibility study shows favorable results, additional funds will be sought for design, construction, and maintenance costs of the chosen diversion method. There will be considerable opportunity for cost sharing, including technical and financial assistance from various agencies and from the ditch owner. It is premature to estimate the amount of third-party cost sharing because neither the total cost nor the feasibility or type of diversion improvement has been determined.

4. [40] If proposal impacts, beneficially or adversely, the environment of the Southwest Planning Region, the Gila River, its tributaries or associated riparian corridors, use the best available science to:

- a. Describe and quantify how the proposal might impact the project site and environment, particularly state and federally-listed species. [up to 10 points]

This proposal is for structural improvements instream and directly off-stream, providing direct benefits to riparian areas and listed species. Improvements are in water quality, water quantity, and stability of the streamside environment (vs. experiencing frequent degradation) including bank stability, riparian habitat, and fish/wildlife habitat. All impacts are beneficial when planning is proactively coordinated with regulatory agencies to ensure there are no unintended consequences to resources (e.g., Clean Water Act) or species (e.g., Endangered Species Act). New Mexico (Catron Co.) portions of the San Francisco River have species listed under the Endangered Species Act, such as Southwest Willow Flycatcher and Loach Minnow.

- b. Describe and quantify the proposal's efforts to mitigate possible adverse impacts on the environment, particularly riparian areas and state and federally-listed species in the Gila Basin and at the specific location of the proposal. [up to 10 points]

Site-specific NEPA analysis would be conducted. An interdisciplinary planning team -- along with proactive coordination with other state and federal agencies, use of best management practices, plus public input -- provides for developing site-specific plans to minimize or eliminate potential negative impacts and ensure regulatory compliance for each resource specialty such as laws relating to water, wildlife/fish, heritage/archaeological resources, etc. Floodplains and wetlands are regulated in part through federal Executive Orders 11998 and 11990:

(<http://water.epa.gov/lawsregs/guidance/wetlands/eo.cfm>). Forest Service NEPA projects must consider effects to endangered and sensitive species; coordination with U.S. Fish and Wildlife Service is often necessary. Direction on floodplains, wetlands and riparian areas is also in Forest Service Manuals 2526 and 2527 (www.fs.fed.us – publications – directives –manuals). The listed species would have direct and indirect benefits from the proposal relating to water quality (loach minnow), riparian habitat (southwest willow flycatcher nesting habitat), and water quantity (benefits all species).

- c. Describe and quantify how the proposal may benefit the environment, particularly riparian areas and state and federally-listed species in the Gila Basin and at the specific location of the proposal. [up to 10 points]

This project would provide benefits to the riparian areas through stabilization and increased water quantity and quality along the San Francisco River; to irrigator, the State, and the U.S. public by improving supply and irrigation transport efficiencies, thus reducing water losses; water quality (affects irrigation efficiency) by eliminating frequent deterioration and repeated installation of earthen berms; fish habitat by maintenance of the substrate and elimination of a barrier, reduction in negative impacts to stream health and channel configuration, reduced expenses to irrigators, etc. Diversion improvement would provide for the minimization and/or elimination of current negative impacts created every time the river floods and heavy equipment is required to reinstall an earthen dam. The NEPA analysis to be conducted before approval of any construction would identify the potential for harm to listed species.

- d. List any environmental statutes, rules, or regulations that may apply to the proposal, and demonstrate how the proposal implementation will comply with such laws, rules or regulations. [up to 10 points]

Exemption for Irrigation Improvements:

Pursuant to Section 404 of the Clean Water Act (33 USC 1344) and Federal Regulations (33 CFR 323.4(a)(3)), certain discharges for the construction or maintenance of farm or stock ponds or irrigation ditches have been exempted from requiring a Section 404 permit. Included in the exemption are the construction or maintenance of farm or stock ponds or irrigation ditches, or the maintenance (but not the construction) of drainage ditches. Discharges associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to irrigation ditches are included in this exemption (Attachment 5: Irrigation Exemption Summary, US Army Corps of Engineers, Albuquerque District, nd)

The federal Clean Water Act (Federal Water Pollution Control Act – 33 USC 1251 *et seq.* 1977) is administered by the New Mexico Environment Department which establishes state water quality standards. The San Francisco River has a segment listed as impaired under the Clean Water Act:

(<ftp://ftp.nmenv.state.nm.us/www/swqb/303d-305b/2010/USEPA-Approved303dList.pdf> - HUC 15040004 San Francisco, segment Dry Creek to Whitewater Creek).

This segment is not supporting its designated beneficial use of Marginal Quality Coldwater Aquatic Life due to problems with macroinvertebrate communities. Macro-invertebrates populations and diversity are often related to water quality. Negrito Creek is not supporting High Quality Coldwater Aquatic Life due to water temperature, which can be related to sediment, channel width/degradation, or other factors. Centerfire Creek is not supporting its designated beneficial use for High Quality Coldwater Aquatic Life due to water temperature, nutrients, pH and specific conductance issues. Cumulatively, these impact the San Francisco River; therefore, any efforts to reduce sediment or improve water quantity/quality along the entire San Francisco River will help the mainstem.

5. [70] Describe any economic or cost analysis information and data for the proposal:

- a. Quantify estimated economic benefits including environmental, recreation, value of water itself, value of the water to the regional economy, increased economic growth, protection against loss of jobs, agriculture, ranching, local economic sustainability or growth, or other. [up to 10 points]

The Balke Ditch system is used by a single entity and it is a comparatively small diversion system. Its usefulness as a demonstration project is greater than the small economic benefit that would go to the Ranch. The estimated increased diversion efficiency would potentially increase the availability of up to 19 acre feet of water annually to downstream water users; if we arbitrarily assign a value of water of \$5,000 per acre foot, a potential economic benefit of \$95,000 annually is realized.

- b. Quantify estimated costs including planning, design, and/or construction, environmental compliance, operation, maintenance, repair, and administrative costs or other. [10]

Cost Estimates: Refer to sections 3a through 3d above for cost estimates.

- c. Identify the source of local contributions and demonstrate the commitment and ability to pay any local cost-share for project proposal, including any applicable exchange costs [1 point for every % of project cost to be borne by local sponsor up to 50 points]

Some work on pre-engineering design, biological and ecological investigations, and administrative support have already been provided to this project via work the USFS has accomplished in support of the alterations to the existing diversion structure. Additional work of the same nature will be conducted during the feasibility study.

6. [120] Describe how the proposal addresses the needs of a particular group or groups or interests on the issues of

- a. Historic uses, traditions, cultures, and customs. [up to 10 points]

Historic-traditions-cultures-customs:

Irrigation has been part of southwestern New Mexico for a very long time. Below is a 1907 photograph of irrigation at Fort Bayard, which is in the AWSA four-county area. (<http://www.fs.fed.us/r3/about/history/gila/pages/gil029.jpg.htm>)



1907—Irrigation at Fort Bayard Nursery. The transplant seedlings are irrigated by running water down small trenches between rows 10 inches apart. Photo by W. R. Mattoon FS #68389

On the website for the Arizona Water Settlements Act Stakeholder Group (www.awsaplanning.com) is a Power Point presentation prepared by **Tink Jackson, District 3 Manager, New Mexico Office of the State Engineer and NM Gila River Watermaster**. The presentation is entitled, A History of the Gila River Basin in New Mexico: Events, Adjudications and Limitations. Slide #7 includes the following (SE – State Engineer):

1930's report by SE showed approximately 30,000 acres irrigated in Gila Basin

The 1892 Luna Irrigation Ditch Association pre-review Tier 1 application provided a good review of the historic and future demand which also relates to this proposal. A portion of the 1892 Luna Irrigation Ditch Association's proposal is on National Forest System lands administered by the Gila National Forest:

“In 1883 the first settlers arrived in the Luna Valley. They started farms and began constructing an irrigation ditch system. In 1892 they filed declarations of ownership on all the un-appropriated water in the San Francisco River and its upstream tributaries and began construction of a dam ten miles upstream in Apache County, Arizona Territory, to store water to be used in dry seasons.

The ditch system, although state of the art in the 1890's, is still an open earthen ditch with all of the problems and inefficiencies connected thereto. From the diversion point on the river to the last water user, water is lost to percolation, evaporation, gopher holes, leaky check gates, etc. Flash floods during monsoon rains destroy ditch banks and/or cover ditches over. The diversion from the river has to be rebuilt a half dozen times each irrigation season due to flash floods and vandalism. More effective use of

our resource will provide additional water for all downstream users in the Gila-San Francisco basin.

The 1892 Luna Irrigation Ditch Association believes that water conservation issues alone dictate that we do all in our power to bring our system up to more efficient standards. We who have lived all our lives in the desert southwest are aware of the fact that we must conserve the limited amount of water we have and use it wisely. Continued population growth and development and increasing demands for water, coupled with our unpredictable drought cycles, make it all more imperative that we act.”

- b. Current and future demands for water in the Southwest Planning Region. [up to 20 points]

This project will help meet community needs by improving the water delivery system to irrigated fields, and is in accordance with historic uses of the water, irrigation traditions, and customs. These projects will provide environmental benefits to the Gila-San Francisco basin for generations, as well as helping meet current and anticipated future water demands.

This project is expected to provide an increase in both water quality and quantity to users in the Gila and San Francisco drainages. It will augment existing supplies by reducing the seepage from diversions and canals, resulting in more efficient application to the land.

- c. Flood control.[up to 20 points]

Any of the anticipated alternatives to push-up diversion dams that would be proposed as a result of this feasibility study will have minimal effects on flood flows in the San Francisco River.

- d. Fire protection, prevention, or suppression. [up to 20 points]

Any of the anticipated alternatives to push-up diversion dams that would be proposed as a result of this feasibility study will have minimal additional water storage that could be used for fire protection. The reliability of the stored water would be expected to increase, thus there would be additional local fire protection (at the Ranch) due to the increased ability to store water in the Ranch pond during lower flow periods.

- e. Recreation. [up to 20 points]

Additional ponded water behind a diversion alternative may provide increased recreational fishing. However, because of the remoteness of the Balke diversion, this recreational benefit would be minor at best and limited to the vicinity of the diversion.

- f. Environmental protection and/or enhancement. [up to 20 points]

This reach of the San Francisco River is designated loach minnow critical habitat (and currently occupied), and proposed spikedace critical habitat. These are both federally listed species. Other portions of the San Francisco River have species listed under the Endangered Species Act, such as Southwestern Willow Flycatcher and Chiricahua Leopard Frog.

Site-specific NEPA analysis would be conducted using an interdisciplinary analysis (Forest Service Handbook 1909.15). Consultation with other agencies having jurisdiction is conducted as appropriate (e.g., New Mexico Environment Department, Army Corps of Engineers, U.S. Fish and Wildlife Service, etc.). Effects to threatened, endangered, or sensitive species are examined in some detail, often in a separate report supporting the decision and sometimes requiring concurrence from the U.S. Fish and Wildlife Service. Some examples of Forest Plan and agency guidance in responding to ISC Comment re: water supply/demand (#5).

Some NEPA analyses and project decisions may be done under a Decision Memo (DM), which indicates (per regulation in 36 CFR 220) that the project type was in a national category determined to have few environmental impacts. This type of project is “categorically excluded”(CE) from further analysis in an Environmental Analysis (EA) or Environmental Impact Statement (EIS) if there are no cause-effect impacts of a high degree affecting (1) threatened or endangered species or critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species; (2) floodplains, wetlands or municipal watersheds; (3) Congressionally designated areas such as wilderness, wilderness study areas or national recreation areas; (4) inventoried roadless areas or potential wilderness areas; (5) research natural areas; (6) American Indians or cultural sites, or (7) archaeological sites, or historic properties or areas.

- g. Any others. [up to 10 points]

7. [40] List those supporting the application, including federal, state, and local government entities; Indian nations, tribes or pueblos; irrigation or conservation districts; non-profit organizations; and other entities. Provide letters or resolutions of support for the application. [up to 40 points]

Attached is a letter of support from the Balke Ranch owner, Mr. Ed Miller and a letter of support from the Luna Irrigation Ditch Association (Attachments 3 and 9).

The US Army Corps of Engineers has provided both technical and financial support for a similar project in New Mexico (Attachment 4). Partial or matching funds may be available. Quoting from this attachment:

...[work will be] conducted under Section 1113 of the Water Resources Development Act of 1986 (Public Law 99-662; 33 U.S.C. 2201 et. seq.), as amended. The Act

authorizes the Acequia Rehabilitation Program for the restoration and rehabilitation of irrigation ditch systems (acequias) in New Mexico. The Labadie Ditch rehabilitation project also qualifies under Section 215 of the Flood Control Act of 1968, Public Law 90-483, as amended. Section 215 provides that the Secretary of the Army may enter into an agreement to credit or reimburse the costs of certain work accomplished by states or political subdivisions thereof, which later is incorporated into an authorized project.

The Balke Ditch owners have contacted the Forest Service, also seeking assistance on a similar project. Other ditch owners have similar ditch issues, and it is expected that a successful project would stimulate additional interest on NFS lands.

The New Mexico Environment Department has been involved with the AWSA Stakeholder group. As a group, the Stakeholders supported this proposal.

8. [30] Describe whether the proposal would benefit one or more than one of the counties in the Southwest New Mexico Planning Region – Catron, Grant, Hidalgo, and/or Luna Counties. [10 points/county up to 40 points]

Principal direct benefit would be to Catron and Grant Counties.

9. [50] Describe whether the proposal would support economic growth or benefit one or more than one of the following interests in the Southwest New Mexico Planning Region – agricultural, ranching, municipal, recreational, or other (specify). [10 points/interest up to 50 points]

Agricultural (see also 6a above) – these are agricultural irrigation systems.

Ranching (see also 6a above) – local ranchers are primary users of the irrigation water.

Recreational (see also 6e above) – the San Francisco River is highly valued by recreationists and environmentalists, who enjoy its diverse flora and fauna. Enhanced water quality enhances the recreation experience.

Other – Natural Systems – improve water supply, water quality, and habitat for endangered fish and wildlife (e.g., loach minnow, southwest willow flycatcher).

ATTACHMENTS:

1. Figure 1
2. Gila River Hydrographic Survey, Reserve Area, Sheet 1
3. Balke Ditch Letter of Support
4. Example: USACE Findings of No Significant Impact to Labadie Ditch Rehabilitation, New Mexico
5. US Army Corps of Engineers Irrigation Exemption Summary

6. Oregon Department of Fish and Wildlife – Push-Up Structures and Watershed Health
7. Cross-Vane, W-Weir and J-Hook Vane Structures – D.L. Rosgen
8. Gravel Push-up Dam Removal, Lower North Fork John Day (Oregon)
9. Luna Irrigation Ditch Association Letter of Support