MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

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TO:	Commissioners Simpson, Brown, Helgeson, Manning and Mital
FROM:	Steve Newcomb, Environmental Management Department Manager
	Karl Morgenstern, Environmental Management Supervisor
DATE:	September 6, 2013
SUBJECT:	Climate Change and the Voluntary Incentives Program
OBJECTIVE:	Information Only

Issue

The McKenzie River is the lifeblood of EWEB, providing the citizens of Eugene with clean and abundant drinking water and the means to generate electricity. Recent climate change research from Oregon State University indicates a 2°C increase in temperature results in significant loss of snowpack and associated snow water equivalent in the McKenzie Watershed. This shift in snowpack and water storage (as snow water equivalent) will have an impact on water flow in the river. EWEB is working to implement the Voluntary Incentives Program pilot project in 2014 that focuses on protecting riparian and floodplain forests as a way to help mitigate for climate change impacts. Protecting natural riparian corridors will increase watershed resiliency to increasingly volatile and unpredictable weather patterns that will result from climate change in the near term.

Background

Earlier research conducted by Anne Jefferson, Gordon Grant and others at Oregon State University (OSU) found that the High Cascades geology in the McKenzie Watershed is a critical feature to the hydrology of the river and the Willamette Basin as a whole. The High Cascades geology consists of recent lava flows (approximately 3,000 years ago) that appear today as large basalt boulder fields with few if any streams or other surface runoff features on the landscape. Precipitation as snow or rain infiltrates directly into this coarse and highly porous geologic material and emerges in a system of large springs about 4 to 6 years later. This huge natural reservoir is located in the upper McKenzie Watershed (covering over 40% of the watershed) at elevations that currently receive large snow pack and approximately 110" of precipitation a year. The large spring system accounts for over 82% of the flow in the McKenzie River during late summer/early fall low flows.

Recent OSU research on climate change impacts by Eric Sproles, Anne Nolin and others evaluated how a temperature increase of 2°C would impact snowpack in the McKenzie Watershed. Their findings indicate the average date of peak snowpack would shift 12 days earlier and the McKenzie would lose 56% of the volume of water currently stored as snow across the basin. This amounts to more than twice the volume of Cougar Reservoir. Elevations from 3,000' to 4,500' above mean sea level (AMSL) would transition from snow to rain dominated precipitation patterns. The significant loss in snowpack in this elevation zone occurs mostly in the areas of the McKenzie Watershed that have older Western Cascades geology with little capacity for groundwater storage of precipitation. In

other words, increased rains at this elevation zone will runoff rather than be held as snowpack and slowly released during spring thaw.

Riparian forests are critical for slowing and adsorbing flood waters, controlling bank erosion, removing nutrients and pollution, and providing key habitat for a variety of species including salmon. Over the last 6 years, EWEB's Drinking Water Source Protection Program has been evaluating trends and impacts associated with development in the watershed that can affect those lands. Studies from the University of Oregon indicate that Lane County Development Code is insufficient to protect riparian areas and floodplains from development. Hundreds of homes have been built within 50 feet of the river and in the floodway (i.e., the major conveyance of water during more frequent flood events). Based on modeling, over 2,500 homes are currently within the 50 year flood inundation zone. LiDAR analysis indicates that over 64% of the riparian forests in the McKenzie have been impacted with approximately 35% significantly degraded. EWEB was not successful in working with Lane County in 2010 to implement an ordinance that would have provided greater protections of riparian forests in municipal drinking watersheds. Since failure of the ordinance, EWEB staff has worked closely with McKenzie residents, local partners and universities to develop voluntary approaches for achieving riparian forest protection at a scale that is meaningful.

Discussion

Anticipated temperature increases of $2^{o}C$ or more as a result of climate change will result in a significant loss of snowpack in the elevation zones from 3,000' to 4,500' AMSL. Increased precipitation amounts as rain and the likelihood of more rain-on-snow events will increase the frequency and magnitude of flooding in the McKenzie during late winter and early spring. The loss of snowpack will result in a longer dry season, leading to reduced river flows (locally and regionally) and increased stress on forests. Forests affected by these conditions will be more vulnerable to infestation and disease, which increases the risk of severe wildfires. The predicted increase in flooding and wildfires will impact EWEB infrastructure in the watershed and raw water quality.

One strategy to prepare for climate change impacts that has started to gain attention with utilities across the west is the concept of investing in watershed services that provide increased resiliency in the face of these threats. For the McKenzie Watershed, investment in watershed services centers around the protection and restoration of riparian forests. Riparian forests play a pivotal role in reducing damage from flooding and increase natural resiliency after major flood or fire events. In the March 23,2012 Board Memo, EWEB staff provided the Board with information about the results of a watershed valuation study that used benefit transfer methodology to assign values to natural capital like wetlands and riparian forests that currently have zero value in today's economy. The calculated value of riparian forest buffers in this watershed valuation study ranged from $1,031 to $6,717 per acre/year. For the last 4 years, EWEB has worked closely with researchers at OSU and U of O, local partners (McKenzie Watershed Council, McKenzie River Trust, Upper Willamette SWCD, Cascade Pacific RC&D, LCOG, USFS), McKenzie landowners, western water utilities, and others to design, develop, fund and document the Voluntary Incentives Program (VIP) concept that aligns watershed investments in protecting and restoring riparian and floodplain forests. The VIP would compensate landowners with an annual dividend payment or services in return for protecting the natural capital that helps provide water filtration, flood and erosion control and other services for clean water.

EWEB and several partners with outside funders are ready to implement a pilot project in 2014 to test drive this concept and determine if full roll-out of the program makes sense and can be

accomplished to achieve the goals of protecting the remaining healthy riparian forests. To achieve these objectives, the VIP will focus on properties that have healthy riparian areas within a pre-defined boundary. The VIP boundary includes approximately 8,200 acres of riparian and floodplain areas along the McKenzie and its tributaries (non-federal ownership only), of which 2,950 or 36% appears to have adequate riparian forest cover.

The VIP pilot will allow EWEB, local partners, and landowners to test and refine programmatic elements. The pilot program allows VIP partners and landowners to adjust and make recommendations to improve the VIP before expanding it to more landowners. The key objectives of the pilot project are to:

1) Evaluate the feasibility of the VIP
2) Refine VIP partner roles and program criteria
3) Establish projected budget needs
4) Develop a website/dashboard to inform landowners and ratepayers
5) Build relationships through continued outreach and recruitment

As part of the program there will be an expectation of landowners, program partners, funders, and EWEB to evaluate the effectiveness of the program and report on the feasibility for expanding the VIP. U of O's recent report titled *Programmatic Recommendations for EWEB's Voluntary Incentives Program (September 2013)* details the various components of this program and recommendations for implementation.

EWEB staff has been working with the Oregon Watershed Enhancement Board (OWEB) over the last year to attract investment in the VIP pilot project. OWEB will consider providing $150,000 toward the pilot in 2014 at their next Board meeting in Burns, Oregon on September 11, 2013. EWEB staff will be presenting and attending this meeting to encourage and support OWEB to commit to this investment. EWEB's Drinking Water Source Protection Program has already budgeted to implement the pilot project in 2014 assuming OWEB makes their investment.

For more detailed reports and information on the VIP see http://www.eweb.org/sourceprotection/vip.

Recommendation
Management recommends moving forward on implementing the VIP pilot project in 2014 with assistance from various outside funders, local partners, McKenzie residents, OSU and U of O. In addition, management recommends returning to the Board in June/July 2014 to review and discuss progress of the Voluntary Incentives Program pilot project and assess potential funding mechanisms that would allow full implementation in the McKenzie Watershed in 2015.

Requested Board Action
No final action is requested at this time, any action associated with funding full implementation of the Voluntary Incentives Program would occur in summer of 2014. Management has included funding for conducting the VIP pilot project in the 2014 budget. The 2014 budget will be acted on later this year.