MEMORANDUM

TO: West Linn City Council
FR: West Linn Utility Advisory Board
Date: June 18, 2012
RE: Recommendation on Water System Improvements and Funding

This memorandum provides the Utility Advisory Board's ("UAB") preliminary recommendation on the repair and replacement the City of West Linn's water system infrastructure and funding options. As discussed below, the UAB's recommendation is based on extensive research, deliberations, and citizen input.

In short, the UAB strongly recommends that the City Council should give its highest priority to the replacement and funding of the Bolton Reservoir. The current condition of the reservoir endangers the citizens of West Linn and the City's failure to take action will only increase costs. Second priority should be given to the repair and replacement of deteriorating water pipes. While the City's water pipes are in dire condition, their failure does not jeopardize the health and safety of West Linn's citizens in the same scale as the condition of the Bolton Reservoir. Given the costs and risks arising from the condition of the Bolton reservoir and many of the City's water pipes, the UAB does not believe the City Council should give a higher priority to any other City program.

The UAB recommends the City Council should propose a ballot measure for voter approval of approximately $10 million in general obligation bonds for the funding of

repairs and replacement of the Bolton Reservoir. Additionally, the UAB recommends the City Council to propose a ballot measure to increase water rates greater than the annual 5 percent limit to permit the City to issue revenue bonds in amounts sufficient to cover the cost of repairs and replacement of the water line, as well as assuring that the City meets state law minimum capacity requirements.

The following information provides an outline of the reasons behind the UAB's recommendation. The UAB is still in the process of collecting more information on the condition of the Bolton Reservoir and assessing information provided by the City's staff. The City's staff informed the UAB at its June 12, 2012, meeting that additional engineering and seismic data will be available by the end of July 2012. Therefore, this memorandum is preliminary and the UAB intends to provide the City Council with a final report after review and consideration of the new engineering information.

Background

In 2011, the City Council identified the repair and replacement of the water system infrastructure as one of the top priorities for the City. The City Council requested the UAB to review the need for these activities and possible funding options for the work. Over the past year, the UAB has met numerous times, collected information, analyzed data and reports, and extensively debated all aspects of these issues.

The scope of the UAB's work has addressed all aspects the issues arising out of the repair and replacement of the water system infrastructure. It has looked at: (i) the condition of the water system and the need for repairs and replacements; (ii) engineering and design alternatives to facility replacement; (iii) funding alternatives; and (iv)

potential rate or tax impacts stemming from funding options. Much of the relevant background data were provided by the professionals of the City's water operations and finance staffs.

Basis for the Recommendation

The UAB intends to prepare a report that explains its recommendation and provides the basis of the recommendation. The UAB will provide that information to the City Council hopefully by the beginning of August. The following attachments are the initial drafts of sections of the report. These sections will be revised and, if necessary, embellished with additional information. They are currently provided to give some preliminary guidance as to the basis for the UAB's recommendation.

Attachment A to this memorandum discusses the condition of West Linn's water system and, in particular, the condition of the Bolton Reservoir. It highlights the fact that the reservoir is not structurally sound. Given its condition and geological risks, it is a hazard to homes located downhill from the reservoir. Additionally, it is undersized for the City's needs.

Attachment B provides a short discussion of reservoir capacity and water demand studies conducted by one of the UAB members, Bill Frazier. He concludes that the capacity of the Bolton reservoir needs to be increased to at least 4.0 million gallons and the water pipe from the South Fork Water Board, which feeds the Bolton reservoir, should be increased in size from 18 inches in diameter to 24 inches.

Attachment C provides a summary of the funding alternatives and a discussion of rate issues. This attachment provides a preliminary discussion on how the UAB

determined that City use general obligations bonds to fund the replacement of the Bolton reservoir and water rate increases to support revenue bonds to fund the water line repairs and replacements.

The West Linn water system infrastructure while generally in satisfactory condition has two significant deficiencies, the Bolton Water Reservoir and a large amount of aging and unsatisfactory pipe.

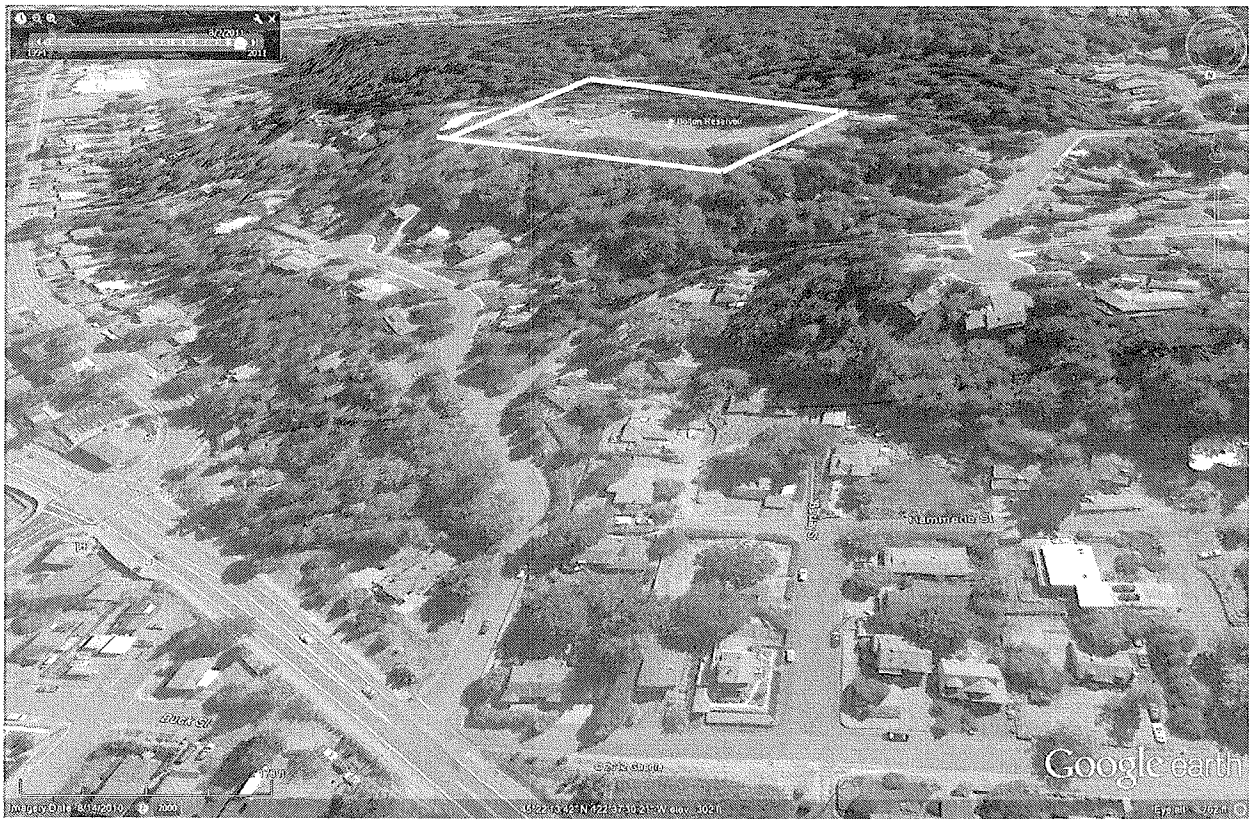
The Bolton water reservoir, built in 1913 is almost 100 years old and has exceeded its design life of 75 years. This reservoir which is the central hub of the West Linn water system has major deficiencies in addition to just being old. Every Water Master Plan has identified this reservoir for replacement is a high priority but has been continuously deferred.

(if used photo needs to be paid for)

The reservoir is physically locates in the Bolton neighborhood off above Caulfield court and highway 43, a central location at the correct elevation to most efficiently serve the needs of West Linn. Relocation of the reservoir is not an option without major reconstruction of infrastructure. This location receives and supplies xxx of the water received from the Southfork Water Plant, establishes the pressure zones for the rest of the city and feeds the smaller reservoirs.

Attachment A

The reservoir is currently 2.5 MG of which only 2.0 is usable due to previous failures of the outflow pipe and reservoir modification. It is not possible to economically repair the original outlet. Originally providing xxx days of storage for West Linn population, the Bolton reservoir can currently store only xxx amount of the peak day water use.



Specific deficiencies for the reservoir are:

1. It is not structurally sound. Built 100 years ago, the concrete slab construction has significant spalling and cracks. This deterioration has required retrofit with a liner in 1989 when the reservoir was leaking badly. This liner (reaching the end of its useful life check with Jimmy ?) does not stop the continued deterioration of the concrete structure. During recent maintenance during which the reservoir was drained, groundwater intrusion revealed a large crack [photo].
2. Constructed prior to the development of current seismic standards, the reservoir does not meet the requirements for seismic survivability for both structural restraint and slope stability. The reservoir is located at the top edge of the Bolton fault, one of the most well-known and active faults in the Portland area which forms the steep bluff above Hwy 43 and created Willamette Falls. The fault has numerous landslides along its length and although the major fault has not moved in 20 thousand years, erosion along the edge results in localized failures. The reservoir is unlikely to have adequate restraint against shaking and is subject to major damage from a seismic event.

3. Increasing the Seismic risk is the now well documented high magnitude earthquakes affecting the Pacific Norwest coastal regions when the Juan de Fuca Plate slips. With magnitudes estimated as high as 9.0 the best science anticipates major damage to infrastructure in the Willamette Valley when the next event occurs. With the last event occurring in 17xx it is still early in the anticipated return period of 600 years to predict an earthquake, archeological evidence does show at least one return period of less than 300 years. Although no real prediction of damage can be made without extensive geotechnical and structural investigations, based on age and known deficiencies, it seems unlikely that the reservoir will survive a subduction zone earthquake.
4. Located at the top of the bluff, any leakage from the reservoir presents a problem for the environment and residents. Prior failure of the aging pipes connected to the reservoir has identified that damage to downhill residences will occur. Major damage to the structural integrity of the reservoir and possible displacement of earth of as might occur as a result of leakage or with a slope failure from erosion or an earthquake could result in a release of portion of the 2.5 MG of stored water.
5. It is well documented that groundwater is the primary cause of landslides. As revealed during liner maintenance last summer?, when water was shooting into the reservoir from cracks, there is significant groundwater around the reservoir which is no longer adequately drained from the structure. This situation aggravates an already risky situation.
6. In addition to long term ongoing deterioration, basic maintenance for the reservoir is also much higher than acceptable. Retrofit with a liner, a cover, repiped inlets and outlets, which are essentially bandaids to stretch the life of the structure, the reservoir is an annual maintenance burden which further aggravates the struggle of the water department personnel in maintaining the most critical infrastructure component for the City of West Linn. Already past its economic life, further delays in replacing the reservoir structure will result in greater risks, higher costs, and further deterioration of other infrastructure components.
7. The reservoir is documented in the master plan as undersized. Utilizing well known and documented engineering design principles intended to protect and serve the West Linn citizens the city requires 2 MG of additional storage to adequately provide for peak day usage and firefighting capacity. Currently on the peak summer day it is documented that the water system cannot keep up with demand. Considering that it was built in 1913 to serve a much smaller population, that is readily understandable. Even with the addition newer and smaller reservoirs also serving the West Linn population, we have much less service capacity with this reservoir than when it was constructed. While this statement has caused controversy due to the Stafford Basin development opposition, there is no connection to West Linn's need for a new reservoir with more capacity.
8. In consideration of its age, size and the critical nature of the requirement, the risk of not replacing the reservoir in a timely manner is very high. Any serious problem with the reservoir will result in high costs to continue basic services throughout the city. Major damage to the reservoir will result in very high emergency service repairs which will be temporary in nature. The reservoir is not an item which can be replaced on short notice like most waterlines. Long

range planning, studies, design and funding must occur to best meet the future needs of the City of West Linn.

Water line replacement is an expensive and ongoing maintenance requirement of all water systems. While there are known examples of century old piping still in service, in general the pipes will deteriorate in less 75 years to the point where ongoing maintenance of breaks and leaks exceed the cost of replacements. Currently West Linn has over 10 miles of pipe, about 10%, overdue for replacement due to size or condition.

Undersized pipe is the result of changing requirements. Typically installed to service a single house or a small number of homes and without providing for firefighting capabilities, these lines range from 2" to 6" and cannot provide adequate services or flow capabilities. Increasing density and higher standards for fire safety dictate that these lines be replaced with new adequately sized pipe. In addition as these lines are generally the oldest pipes in the system, they have much higher maintenance requirements. In 2009-2011 $xxxx was spent on repairs to these lines, efforts which diverted funds and personnel from preventive maintenance tasks which would extend system life and reduce long term life cycle costs.

[photo of small corrosion filled pipe from Jimmy]

Deterioration of water lines occur for many reasons which include wear from water movement, corrosion, aging of gasketing material, displacements due to natural ground movement, changing requirements, construction activities and changing loading conditions. Much of the pipe due for replacement is Asbestos Concrete pipe which is no longer approved for municipal waterline construction in the United States.

There are some examples of major and expensive water line breaks the last few years such as the $xxxx break on the 18" Bolton Reservoir Supply line in xxxx, 20xx. While we are lucky to have avoided spectacular reservoir draining breaks such as those caused by and causing landslides, in 2009-2011 over $xxxx was spend in emergency repairs. These efforts ultimately end up costing more than replacement of substandard pipe over the years in due increased operating costs and repeated repairs.

[photo of 18" repair from Jimmy]

There are also xxx miles of Asbestos Concrete (AC) Pipe in the city. These pipes, installed in the 1950-60 but no longer approved for potable water systems are approaching the end of their expected life. While not inherently dangerous when undisturbed, the AC pipe is much more fragile than current approved materials. Increased maintenance on these line has been tracked over the last decade and is expected to increase as the pipe continues to age and deteriorate. Increasing the costs related to AC pipe is the extra environmental considerations needed when working on it. As almost all work and repairs on the result in disturbance of the pipe, costs are increased for personnel protection and containment.

[photo of AC pipe from Jimmy]

Misc comments

West Linn has enjoyed low water rates for years. While seemingly advantageous, these rates are actually just deferring costs to the future. Eventually, the bills will come due and are likely to be much higher than prudent expenditures today. The costs for emergency repairs and replacement for the Bolton reservoir will be much higher than planning and funding replacement now. Water lines we can continue to fix as they break but ultimately, just like maintaining a 15 year old high mileage automobile, the cost of maintenance exceeds the cost of replacement. And just like the driving experience in the older vehicle, making due with an aging infrastructure means leaks and drips; decreased quality, higher risks, and higher costs. This was not the legacy passed on to us and it should not be the legacy passed on to the next generation.

The West Linn Water Department Budget is based on xxx % for system operations, xxxx% for system maintenance, and xxxx% for repairs. In 2010, the water department cut staffing by one due to budget constraints. The cut was of a fully justified position needed for the efficient long term operation of the water system and represents work not done which will ultimately end up costing the City of West Linn more than the immediate savings.

Attachment A

May 31, 2012
Summary of capacity and demand studies by Bill Frazier

From memos dated December 4, 2011 and January 6, 2012

West Linn water supply system capability to supply peak hourly and maximum daily demands.

The 2008 water system master plan projected maximum daily demands (MDD) to the year 2030 when all of West Linn is built out. However the demand rate dropped from 2008 onward, perhaps due to the economic downturn. Should these lesser demands continue, what effect, if any, would this have on proposed projects such as greater reservoir capacity or new, larger piping from the SFWB?

If nothing was done, the system would not meet the 2030 predicted hourly or MDD that occur in July-August when lawns and gardens need watering. This would also affect the ability to supply water for fire suppression.

If the Boulton reservoir was replaced with a 4.0 Million gallon (MG) reservoir, which is a 1.5 MG increase over current useable capacity, the system could barely meet the master plan prediction, even using the Lake Oswego intertie. Using a prediction based on the current, reduced demand the greater reservoir capacity is needed although the current supply from the SFWB plus the L.O. intertie makes it still somewhat marginal. This configuration can however, adequately supply water for fire suppression at either predicted demand rate.

A new 4.0 MG reservoir and changing piping from 18 inch to 24 inch from the SFWB (giving 10 MGD) would provide adequate capacity for current peak demands based on the 2008 plan and offer increased capability in case the intertie supply is not available or one of the smaller reservoirs is off line.

Attachment B

IV. Funding Alternatives--Submitted by Jon Miller & Ed Keonjian

i. Current Rates.

South Fork Water Board (SFWB): The City of West Linn (COWL) and the City of Oregon City (COOC) split ownership of the SFWB 50/50. SFWB wholesale water rates (38.5% in 1993; 68.3% in 1994; 10% in 2010) and debt bail out (COOC $2.4 million loan to SFWB in 2010 to pay off SFWB bonds, a result of SFWB not meeting its 125% of annual debt service bond covenant) often exceed the COWL water rate 5% voter limitation. SFWB projections indicate that essential long-term capital improvements and wholesale water rates will easily exceed 5%. Hence, how does the COWL continue to absorb these increases while maintaining the 5% annual rate increase to water rate payers?

Water Master Plans: Five Water Master Plans specifying essential water infrastructure projects have been completed and/or updated since 1982 (1982, 1987, 1999, 2004, 2008). The last one, 2008, recommended $33 million ($21 million in existing infrastructure and $12 million system development charges (SDC's) for essential water projects.

Water Fund Financials: The City of West Linn (COWL) Water Fund spawns approximately $3 million in water revenue per year to cover $1 million in wholesale water cost and $1.5 million in annual operating costs, before necessary standard capital improvement are considered. Current revenues have been flat over the last several years, even with 5% annual increases. Thus, essential system capital improvements are insufficiently funded.

Existing Water Rate Structure: The 1994 COWL Council adopted water rate structure includes 7 units of water in the monthly base fee amount charged City residences. As a result, residences using less than 7 units of water per month pay the same as their neighbors using 7 units of water. Two challenges result from this inequity:

1. As the median water usage in West Linn is 7 units, 50% of residences are affected by this inequity. How does the COWL structure a new rate that voters will approve addressing this inequity while still achieving the overall targeted revenue?
2. How to best project the rate level in a conservation-based rate structure, anticipating a certain level of water consumption (assuming conservation will inspire less consumption), while still realizing overall targeted revenue?

5% Plus Voter-Approval Requirement: The 5% plus Charter Amendment has resulted in the lowest utility bills in the region, with the burden of meeting the requirement of keeping in reserve 125% of annual debt service bond covenant for a previous municipal bond. As a result, numerous essential infrastructure improvements have been left unfunded (replacement of the Bolton Reservoir & asbestos pipes are two examples). Although the Charter Amendment provides West Linn voters more control over water rate increases, it presents fiscally unsustainable challenges to adequately fund its aging water system and maintaining in reserves 125% of the annual debt service bond covenant.

ii. Rate increases, General Obligation Bonds and/or Revenue Bonds.

When a state, city, hospital or any other issuer issues a bond, the issuer expects to pay back the borrowed money at some point in the future. The issuer guarantees repayment of the money in one of two basic ways:
1. Taxation such as income taxes, property taxes, sales taxes, etc. (G.O. Bonds)
2. By collecting revenues from the project(s) financed with the bonds (revenue bonds).

General Obligation Bonds (G.O. bonds): When a state, city or other issuer issues general obligation bonds, this means that the issuer is guaranteeing repayment of the bonds using any means necessary. The full faith, credit, and taxing power of the issuer are backing the bonds. This means that the issuer is going to use any taxation power in its authority to make sure you get paid back; the issuer is putting the revenues from every type of tax on the hook to guarantee the bonds: Income taxes, corporate taxes, property taxes, sales taxes, excise taxes, gas taxes, any tax that can be levied by the issuer. This is why it is called a general obligation bond: The issuer is generally obligated. If the issuer has any problems paying you back, the issuer has to raise taxes or come up with the money somehow, some way to pay you back. The issuer may even have to sell assets to do it. If the issuer misses a payment, known as a "default", a judge can order the issuer to take corrective action to raise money to satisfy the bondholders.

Revenue Bonds: Issuers such as transportation systems and authorities, hospitals, power systems, sewer systems, water systems, and other issuers that generate revenues from providing services to the public can issue revenue bonds. The specific revenues generated by the issuer guarantee revenue bonds.

The bonds issued are guaranteed paid back from the revenues that the issuer receives from selling tickets to the public. This is why they are called *revenue bonds*.
Water districts can issue revenue bonds with the revenues from people's water bills guaranteeing the repayment of the bonds. Water, power, and sewer services are considered essential services. This means that bondholders can generally feel secure in knowing that people will pay their water, sewer, and electric bills as the services are essential to living in a modern society. People may skip out on other bills before they stop paying for electricity, water, or sewer services.

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iii. How much funding is needed?
Generally, $9-10 million for replacement of Bolton Reservoir & $10 million for pipe replacement. These figures are based on the November, 2008 Water Master Plan figures and adjusted for inflation. They also were projected for the purpose of standardizing the May survey questions.

The purposes of generalization, funding amounts and timing of the funding reduce to either issuing one bond (G.O. or revenue) for a total of $19-20 million or two bonds, one for the reservoir ($9-10 million-either G.O. or revenue) and one for pipe replacement ($10 million-either G.O. or revenue).

With the G.O. bond option, property tax increases pertaining to the G.O. bond automatically go after 20 years when the G.O. bond is paid off. G.O. water rates would range from just continuing 5% increases when all $20 million are sold using G.O. bonds (the 100% G.O. bond option), to the 100% revenue bond option, which would show 25% increase if $10 million of revenue bonds were sold in year one and laddering the other $10 million over the next 20 years. Moreover, revenue bond option would require future action by the City to decrease water rate increases once it is paid off.

iv. Equity issue:

As a general rule, General Obligations bonds will result in a relatively small higher repayment cost on property owners who live within the city limits as opposed to those who reside outside these limits. However, this advantage should be weighed against the historical reality that, for example, revenue bonds have higher starting costs, that their servicing has to be periodically readjusted subject to such factors as deviations from revenue projections, property vacancy rates, the need to "smooth out" rate increases, and technical financial considerations which affect their desirability for bond purchasers. . Thus, the "equity" answer may not lie in a discussion of only the immediate and relatively predictable burden on property owners, but should also take into consideration factors, which could raise everyone's obligations over the life of the subject bonds.