



Longview Drinking Water Improvement Study
Customer Advisory Committee Meeting #6

Meeting Summary

MEETING DATE: TUESDAY, MAY 19, 2015
LOCATION: LONGVIEW CITY HALL, TRAINING ROOM
TIME: 6:30 PM – 8:30 PM (*meeting ran over till 9:15 pm*)

In Attendance

CAC Members Present

Bill Beltz
Mark Bergeson
Orranda Chamberlain
Raymond Colwell
Philip Dennis
Dave Hooper
Rich Kirkpatrick

Alissa Lee
Patrick Mccoy
Amber Olson
Dave Quinn
Preston Worth
Ken Botero, City Council Liaison
Bonnie Decius, BHWS D Liaison

CAC Members Absent

Stephanie Owens
Vincent Scalesse

Staff and Consultants

Jeff Cameron, City of Longview
Amy Blain, City of Longview
Jeff Coleman, City of Longview
Lee Odell, CH2M

Dan Speicher, CH2M
Brad Phelps, CH2M
Adrienne DeDona, JLA Public Involvement
Jamie Harvie, JLA Public Involvement

Members of the Public

Leeann Colwell
Sonya Elhardt-Olden
Jim Fisher
Jewel & Doug and Gale
Joann Goff
Tracy Goldsmith
Keath Huff
Dan & Tracy Johnson
Art Mahlum
Kristi Morrow
Steve Powell
Julie Salzsieder
Ray Van Tongeren
Claudia Vasquez

Overview Summary

- The CAC worked in small groups to assign ratings to each of the six groups of water supply options based on the evaluation criteria. The committee as a whole discussed the results of the rating process and which groups of options should be eliminated from further consideration.
- The CAC unanimously decided to remove Group 4: Buy Water from or Collaborate with Another Entity; Group 5: End user treatment; and Group 6: Non-infrastructure options from further consideration.
- The groups of options that will remain for further consideration are: Group 1: Stay the Course, Group 2: Modify the Existing Well Source, and Group 3: Build New Surface Water Source.

Information Requests / Parking Lot Items

- Schedule time for CAC discussion with Jim Fisher at next meeting.

Welcome, Introductions, Review Agenda

Adrienne DeDona, JLA Public Involvement, welcomed everyone to the meeting. She said the meeting goal was to narrow down groups of options in order to begin to consider individual options in more depth at the next meeting. She reviewed the agenda and noted that the committee would work in small groups to rate the groups of water supply options and then review the outcomes as a larger group. She said the goal of the exercise was to come to consensus regarding scores within the small groups and then consider whether any groups of options could be removed from consideration as a whole group.

The project team and committee members introduced themselves.

April 14 Meeting Summary

There were no comments on the meeting summary; it would be posted to the project website.

Project Updates

Adrienne said she was still working to schedule an interview with PeaceHealth Hospital and hoped to be able to provide an update at the next meeting.

Amy Blain, City of Longview, provided an update on the outcomes of recent water quality studies. She said a nitrogen study had looked at three components, including ammonia as nitrogen, organic nitrogen and hydrogen sulfides. The ammonia registered as non-detect because it was oxidized in the treatment plant. Organic nitrogen was present in the water. Amy said that organic nitrogen could be hard to detect and it looked like the tests were picking up a delayed reaction. She said the effects of organic nitrogen on chlorine levels could create a bitter taste. She said hydrogen sulfide registered as non-detect leaving the plant; however, testing was also planned at two homes. Amy explained this process: water would be collected from the tap to the street at each house and would consider both hot and cold water. These samples would be compared to a sample from a hydrant on the main to determine the difference between water being delivered and the water in the tap. Amy said those tests were still in process and the results had not come in.

Amy said the second tests the City had completed were chlorine decay in order to determine which well provided the most stable chlorine level. The testing had been completed but the results had not yet come in.

- A committee member asked about the process for the chlorine testing. Amy replied that the finished, or treated, water from each well was sampled and the time it took for chlorine to dissipate was determined.
- Another committee member asked why chlorine would dissipate faster depending on the well. Amy replied that each well has a slightly different characteristics, requiring chlorine dosing to be adjusted slightly to compensate for the different raw water characteristics depending on which well or wells are being used.

Evaluation Process Overview

Dan Speicher, CH2M, explained the evaluation process to the committee, saying it was similar to Consumer Reports. He said that the evaluation tool would input ratings from the CAC for each group of water supply options based on the evaluation criteria and the weights the CAC had assigned the criteria at the previous meeting. He said that the CAC would then evaluate the scores for each group of options and discuss whether the scores reflected the views of the CAC. Based on the scores and their discussion, the committee would decide which groups of options could be removed from consideration and which should move forward for further consideration.

Review Water Supply Groups Performance

Adrienne said that Rich Kirkpatrick had emailed a proposed resolution to her and she had forwarded it to the committee. Rich summarized his proposal to the group, which was to remove the Status Quo option from consideration based on the assumption that the problems stemmed from the source of water. Adrienne asked the committee for their input.

- A CAC member said he agreed that the source was the problem. He said that, based on results of the taste testing prior to the last CAC meeting, the main problem was not taste but silica, and the silica issue could not be solved except by changing sources or reverse osmosis, which would be cost prohibitive.
- Another CAC member said he thought the group would eliminate the status quo based on the evaluation process, but could agree to eliminate it immediately.
- A CAC member said that cost was an important factor to consider and he thought all options should be evaluated considering the cost. Adrienne said that cost would be one of the factors considered during the evaluation process.
- A CAC member said he would like to run the numbers and consider the status quo. He said that not everyone had problems with their water, so the status quo should be considered along with the other options.
- A CAC member said that the committee must consider indirect costs to customers and that the status quo would be very expensive due to indirect costs. Adrienne noted that indirect customer costs would also be a factor considered in the evaluation process.
- The committee voted on whether to eliminate the status quo. Two members voted in favor of eliminating the status quo immediately; the majority of the group voted in favor of evaluating it along with the other options. It was decided to review the status quo as part of the evaluation process.

Lee Odell, CH2M, reviewed the handouts in the meeting packet, which listed the water supply groups, the individual options within each group, and how each group addressed the evaluation criteria. He noted that the monetary figures provided under the Impact on Customer Rates category reflected the changes to customers' monthly water bills, based on capital, operations and maintenance costs divided by the number of equivalent dwelling units and based on a 20-year bonding rate. He noted that for the Group 4: Buy Water from or Collaborate with Another Entity, these cost estimates only included infrastructure to get the water to customers and not any costs for the other entity to increase capacity, so the actual costs would be higher than the estimates.

- A CAC member asked how they arrived at the cost estimate for the Ranney collector. Lee replied that they had a consultant provide an estimated cost for building a well and transmission system.
- A CAC member asked whether a new treatment plant would be needed with the Ranney well option. Lee replied that this wouldn't be determined until further testing was done, but the assumption for the costs provided were that the water would not be considered a surface water source and that only UV disinfection and chlorine treatment would be required.
- A CAC member asked whether the cost estimate included treating iron and manganese. Lee replied that they did not, but other options included piping to the Mint Farm treatment plant where those types of treatment facilities already existed.
- Another CAC member had concerns about the math behind the cost estimates provided. He said that a cost of \$10/month per customer seemed like it should result in more money over 20 years than shown in the handout. Lee said that they could go through the calculations following the meeting, if desired.

Lee explained the technical ratings that had been prepopulated in the rating sheets. He said that the CAC would consider these ratings within their small groups and may decide to change them based on their own opinion.

- A CAC member asked how the project team estimated the indirect costs to customers. Lee replied that CAC members would provide their best judgement to estimate these costs.
- The CAC member asked whether there had been any customer surveys to help determine indirect costs. Adrienne said that no new surveys had been done but that CAC members could draw on the anecdotal information that had been provided to help inform their estimates.
- Another CAC member said he didn't know how one would determine that sort of information (indirect costs to customers).

Adrienne asked Mark Bergeson to address the committee regarding an issue that he had brought up via email. Mark said he had felt there had been an "elephant in the room" related to an e-mail written to the CAC by Jim Fisher. He said it had been mentioned but had not been considered in detail. He said the memo concerned migration of industrial toxins into the water supply and that this was an important issue

for the committee to consider. He said that he had not been aware however, that Mr. Fisher’s correspondence had already been addressed point by point by the City over the past several years in a series of formal responses (attached to this summary). Mark said he had recently reviewed the correspondence in detail and provided his interpretation of the information. He noted that each member of the committee should review the information and determine his or her own opinion. He said that his view was that: 1) in researching and preparing for the wells, the City had retained multiple engineering and environmental firms who were competent and capable to analyze feasibility, 2) that every professional evaluation had determined that the Mint Farm water was safe and reliable and would be for many years, 3) no compounds related to agricultural or industrial uses were detected in the deep groundwater, 4) the net result of water taken from the aquifer and recharge would result in only minor overall drawdown of the aquifer, 5) pilings did not create a pathway for contaminated water, 6) all studies indicated that there was no migration pathway for toxins and that a confining layer created a lack of transport mechanism for toxins to the aquifer. Mark reiterated that each committee member should consider the information presented because the CAC held the responsibility of providing a recommendation to Council. He said that purity and cleanliness was at the heart of the water issues and that his interpretation was that contamination was not likely to occur based on the information provided.

- Jim Fisher was present in the audience and said that he would like to have a chance to provide the information from his own point of view.
- The CAC discussed whether they would like to hear from Mr. Fisher at that point in the meeting.
 - One CAC member said the issue would be irrelevant if the committee eliminated the status quo from consideration during the evaluation process. He said that the correspondence had been going on for several years and the research results had been clear. He said the committee should trust the results of the consultants.
 - Another CAC member wanted to hear from Jim Fisher, saying the committee should be mindful of all possibilities.
 - A CAC member said his interpretation of the reports were that they showed differences in professional opinion. He said that either outcome had a possibility of occurring and that experts would continue to argue whether about the likelihood of occurrence. He said that the water system must have a back-up and if Mint Farm was the ultimate solution, then back-up solutions must also be considered in case of contamination. He said this would need to be considered for any solution that is chosen.
 - The CAC took a vote on whether to hear Mr. Fisher speak and were divided. Adrienne suggested that the committee move forward with the planned agenda to evaluate the groups of options and to schedule a discussion with Mr. Fisher at the next meeting. There was general agreement from the committee.

Small Group Discussion: Evaluate Water Supply Groups

Adrienne asked committee members to work through the score sheet in their small groups. She reminded them that the goal was to come to a consensus about scores within each small group, the aggregate scores would then be considered by the larger committee. The committee worked in the following small groups to develop scores for each group of water supply options. The three group scores were combined as part of a decision model analysis prepared by CH2M:

Group 1	Group 2	Group 3
Bill Beltz	Dave Hooper	Mark Bergeson
Amber Olson	Alissa Lee	Orranda Chamberlain
Dave Quinn	Patrick Mccoy	Raymond Colwell
Bonnie Decius	Preston Worth	Philip Dennis
	Ken Botero	Rich Kirkpatrick

Public Comment

Adrienne noted the time to be 8:25 p.m. and the scheduled meeting end time was 8:30 p.m. She said that the committee had decided to stay past their scheduled time to continue the discussion of the water supply groups; however, she wanted to pause at the current point of the meeting to hear public comment before moving forward. She invited members of the public to leave following public comment or to stay for the remainder of the committee discussion.

Ray Van Tongeren said he was surprised and disappointed that some of the committee members and/or members of the audience were not running for the upcoming City Council elections.

Art Mahlem said he had previously mentioned his friend who was a co-chair for water in Snohomish County; she had recently returned to visit and she was humored to hear about the water taste testing and was concerned about chlorine, silica and magnesium and whether they were tested for. He said he was concerned about pipe flushing he had seen being done and said that the Seattle tasters should have tasted

the discolored water that was being flushed. He said he lived at the end of a dead-end street and his water is discolored. He showed a photo of a sign posted while water was being flushed and said it was near two schools. He said the water should obviously be tested.

Steve Powell said that the measurements provided in the Environmental Impacts section of the handout explaining how each group addressed the evaluation criteria should be simply “megawatt,” not “megawatt/year.” He said that the kick-off and evaluation criteria public surveys indicated that there is a widespread dissatisfaction with the state of Longview’s current water so the option of the status quo is not going to satisfy the majority of the residents. He said that collecting information through a random survey would be a way to collect information on indirect customer costs. He said his opinion was that a Ranney Collector on the Cowlitz River would be the lowest cost option for rate payers that relieves the current problems being experienced. He said he would recommend that the committee ask the City Council to allocate money to do a feasibility study to determine whether that is a feasible option.

Tracy Goldsmith said that the committee should keep in mind that the well system is only good for 20 years. She asked Amy Blain whether that was correct. Amy replied it was not correct, the Mint Farm plant had a current capacity of 17.4 MGD with the possibility to expand to 25 MGD and that the City’s water rights were based on a 50-year projection. Tracy asked how long the source was expected to provide water. Amy replied that the Columbia River would dry up before the aquifer.

Claudia Vasquez said she is disappointed because she felt that the committee was not any further along than they were months ago. She said she agreed that a new source is needed. She said she didn’t feel that the current water was fit even for animals. She said she did not drink it, brush her teeth or wash her car with it and that she can’t wash white clothes in it. She said it tasted like it has dead animals in it. She said she hoped that the committee would decide to go with another source. She said she had lived in Longview for 40 years and liked it there because of the good water quality and that she would move elsewhere if the problem didn’t improve.

Joann Goff said that people would be willing to pay more for better quality water and that she spent \$100 per month on bottled water. She said that her shower and tub needed to be replaced because of the silica staining. She said that thousands of dollars in damage was being done to her home and she thought the City should pay for it. She said she didn’t believe that some people were not having problems with the water and that she had heard from people all around the area that had problems with the water. She said she used bottled water to drink and brush her teeth and didn’t like having to bathe in it. She said that she was scared of the health problems that could be caused by the water.

Scoring Results Discussion

Dan Speicher noted that the evaluation tool is meant to help the group come to decisions; it is not meant to make the decision. He said that once the committee decided which water supply groups were worth further consideration, the project team would provide much more information on each option at the next meeting.

Lee Odell noted that the costs provided for the Regional/Intergovernmental Agreements options only included infrastructure plus a low-end placeholder estimate for the water itself. The actual cost of these options would likely be higher than the estimates provided depending on the agreements reached.

Dan presented the results from the small group ratings (attached to this summary). He presented a bar graph to show the collective value for each of the water supply groups. He presented a Value-to-Cost Comparison graph, showing the CAC ratings of each group of options and compared to the estimated cost impacts to monthly water bills. Dan said that the results show that the Non-Infrastructure and Wells groups of options were rated as providing less overall value based on all criteria than the status quo, whereas the Surface Source, Regional/Intergovernmental Agreements and End User Treatment groups of options were rated as providing more value than the status quo. He noted that the graph also showed the value per dollar ratio for each group of options.

- One CAC member said that the two lowest rated groups of options should be eliminated.
- Another CAC member said it didn’t make sense that one group of options could rate lower than the status quo when it was intended to be an improvement option. Dan replied that the results were based on the evaluation for each option based on the 17 different criteria, including cost, so an option that only provided small benefit could rate lower than the status quo because it would still cost money.
- A CAC member asked whether Dan thought that the results indicated a fault with the scores. Dan said his interpretation was the graphs showed CAC members thought improvements to the wells or non-infrastructure improvements would do very little to improve the current situation and that was why they were rated so low.

Determine Preferred Water Supply Groups

Adrienne led the group in discussion and voting on which water supply groups to eliminate from further consideration. Longview City Council and Beacon Hill Water and Sewer District representatives did not vote.

Group 6: Non-infrastructure

- **The committee unanimously voted to remove Group 6 options from consideration.**

Group 4: Buy Water from or Collaborate with Another Entity

- **The committee unanimously voted to remove Group 4 options from consideration.**

Group 5: End user treatment

- Initially, two CAC members voted to keep this option on the table. After further consideration and discussion, the two CAC members changed their votes.
- **Ultimately, the committee unanimously voted to remove Group 5 options from consideration.**

Group 1: Stay the Course/Status Quo

- One CAC member said he didn't feel that the costs had been considered enough to consider whether to keep or not keep various options. Adrienne said that any options kept for consideration would be further evaluated with more detailed cost estimates.
- The CAC did not have agreement on whether to eliminate this group of options. **The options in Group 1 will be carried forward for in depth evaluation and considered further at the next CAC meeting.**

Group 2: Modify the Existing Well Source

- One CAC member said it didn't make sense for improvement options to rank lower than the status quo.
- The CAC did not have agreement on whether to eliminate this group of options. **The options in Group 2 will be carried forward for in depth evaluation and considered further at the next CAC meeting.**

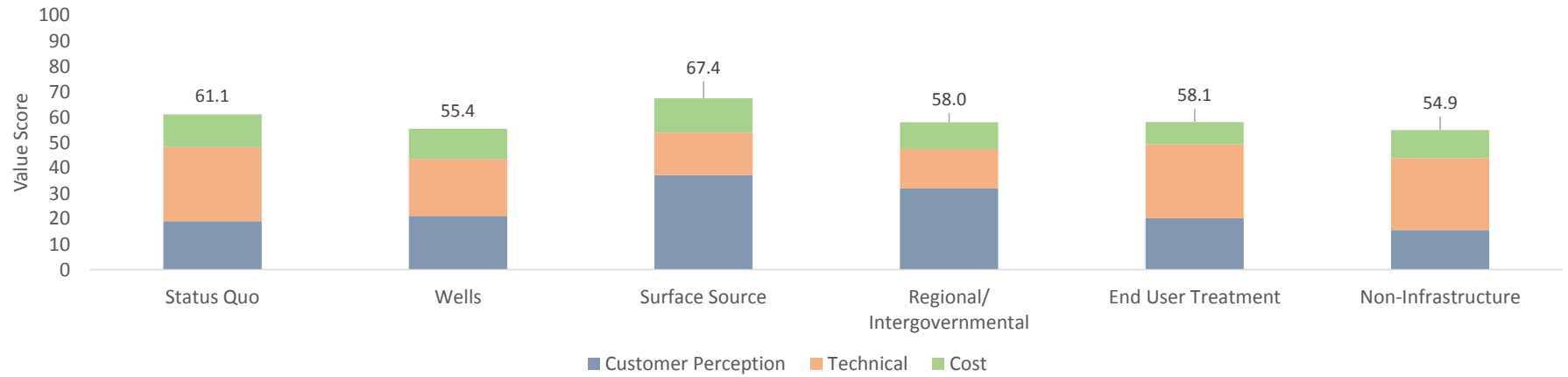
The group did not vote on eliminating Group 3: Build New Surface Water Source (which was rated the highest amongst the groups of options). **The options in Group 3 will be carried forward for in depth evaluation and considered further at the next CAC meeting.**

Meeting Wrap-up and Next Steps

Adrienne told the committee the project team would provide more detailed information about the individual options still on the table for consideration at the next meeting on June 9th. She said that the project schedule moving forward was still to be determined based on the progress they had made tonight. She thanked everyone for their commitment to stay late and adjourned the meeting at 9:10 p.m.

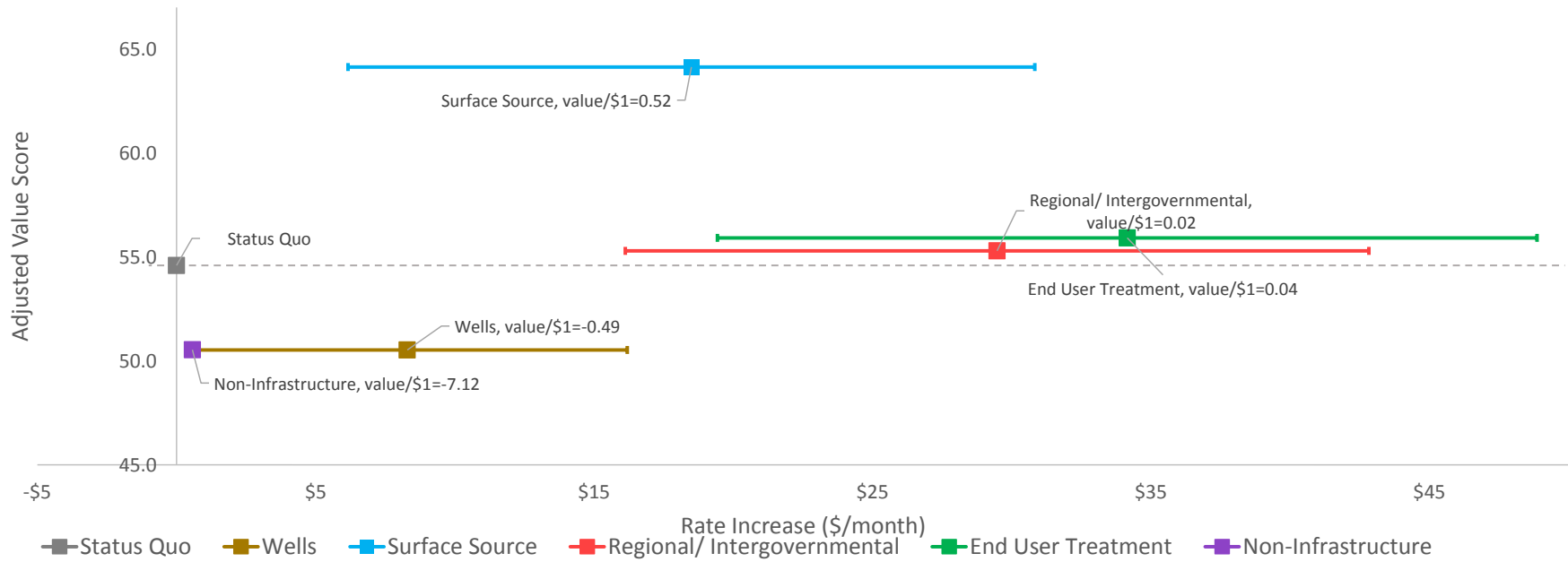
Results for Consensus Weighting

Consensus



Value to Cost Comparison for Consensus Weighting

Consensus ▼





Memorandum

February 3, 2011

TO: Longview City Council
Beacon Hill Water & Sewer District Commissioners
Bob Gregory, City Manager
David Campbell, Assistant City Manager
Kim Adamson, General Manager, Beacon Hill Water & Sewer District

FROM: Jeff D. Cameron, Public Works Director

**SUBJECT: Mint Farm Regional Water Supply Project
Concerns Expressed by Jim Fisher in Letter Dated January 7, 2011**

On January 10, 2011, Mr. Jim Fisher, a citizen of Longview and an environmental consultant, submitted a letter (dated January 7, 2011) to the Longview City Council, Beacon Hill Water & Sewer District, and various regulatory, health, and media organizations. Mr. Fisher's letter objected to the Mint Farm Regional Water Supply Project underway to develop a groundwater supply to serve the City's and Beacon Hill Water & Sewer District's customers. This new water supply will replace the existing Cowlitz River supply. Mr. Fisher suggests the new supply is not safe and would subject our customers to unnecessary risk.

During the early stages of this project, which began with the Pace Engineers Source Analysis dated October 27, 2006, a few individuals were ready to start construction immediately. However, many of us remained skeptical about the safety of a groundwater supply so close to long-term industrial sites with known or suspected environmental issues. We shared many of the same concerns expressed by Mr. Fisher in his recent and previous correspondence. For precisely that reason, the City retained a number of engineering and environmental firms to analyze the feasibility and safety of a groundwater supply at the Mint Farm Industrial Park before proceeding with design.

When the City retained Kennedy/Jenks Consultants, they too were concerned about verifying the safety of the proposed water source, and worked with the City to develop a comprehensive feasibility analysis including the Environmental Site Assessment, Hydrogeological Characterization, and Human Health Risk Assessment, among other work. To ensure no alternative was dismissed prematurely, the project team concluded it must have a level field of comparison between alternatives, and that it must be clear and unequivocal in reporting its findings. The final Preliminary Design Report and its supporting environmental documentation and other analyses are comprehensive and go beyond the standard of care and scientific methods within the environmental engineering practice.

The coverage of field analyses and research of the hydrogeology characterization and water quality investigation evaluated known or suspected areas or sources of potential contamination or hydrogeologic uncertainty. The project team solicited citizen input to address public concerns, and modified the analyses to include many of Mr. Fisher's recommendations on contaminants of concern almost item for item. Nothing was found that presents a risk to human health. The results of the evaluation are thorough, clear, and compelling.

As an environmental consultant, Mr. Fisher is well aware of the environmental review requirements for projects of this type, and that state and federal regulations mandate opportunities for public review and comment specifically to solicit input such as that provided by Mr. Fisher. In addition to the significant public outreach conducted for this project, Mr. Fisher had the opportunity to present this information during three separate public review and comment periods: the water rights application, the NEPA evaluation, and the SEPA review. The forum and late timing Mr. Fisher chose to submit these comments is disappointing.

The City's engineering and environmental consultants, and City engineering and operations staff, strongly disagree with Mr. Fisher's conclusions and have concluded the Mint Farm Regional Water Supply will be a safe and reliable water source for many years. Responses from the project team are attached, embedded into the appropriate sections of Mr. Fisher's letter for ease of reference. Although Mr. Fisher included previous correspondence as attachments to his letter, he restated most of the concerns raised in them in his newest letter, therefore I have not attached that previous correspondence.

cc: Craig Bozarth, City Engineer
Amy Blain, Project Manager
Tom Peters, Project Manager, Kennedy/Jenks Consultant
Washington Dept. of Health
Washington Dept. of Ecology
EPA Region 10
CDC
National Institute of Environmental Health Sciences
Longview Daily News
Jim Fisher
US Army Corps of Engineers

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January 7, 2011

To: Longview City Council, Longview, WA 98632
City Manager
Cowlitz PUD
Beacon Hill Water and Sewer District
Longview Daily News
Washington Department of Ecology
Washington Department of Health
Region X EPA
CDC
National Institute of Environmental Health Sciences

Re: Comments on City of Longview's Mint Farm Drinking Water Well Project

As a citizen of Longview, I respectfully provide the following opinion and comments on the City's project to construct and operate a well system in the Mint Farm Industrial Park to replace the present Cowlitz River-sourced municipal drinking water system. In fact, I have provided several other written sets of comments to the City on this proposed project over the past two years (copies attached), and have studied all available documents and data generated by the City, its consultants, and governmental agencies.

As a water quality scientist and consultant with over 35-years experience, I continue to conclude that: 1) there is an extreme potential unacceptable risk to human health to the citizens of Longview through transport of contamination from under the huge industrial area within the capture zone of the proposed Mint Farm Industrial Park wells, and 2) there is a viable alternative to maintain the present Cowlitz River source by installing pile dikes to increase optimum river velocity and reduce sedimentation at the intake.

Based on incomplete, preliminary and/or misleading information, the City Council voted to approve going forward with the Mint Farm Well project on January 28, 2010, despite the warnings of high risk from myself and many others. Now, within the past few weeks, (December 15, 2010, through January 7, 2011), the City has published a request for bids in the Longview Daily News for the construction of the new groundwater treatment plant and piping for the proposed Mint Farm Regional Water Supply project. The estimated cost of this phase will be approximately \$22 million.

In my view, the City needs to reconsider the merits and impacts the Mint Farm well water project will potentially have on the citizens of Longview before going forward with funding the next phase. The facts clearly suggest the City should place a moratorium on going any further with

the project due to the potential excessive, unknown health risks associated with the Mint Farm project.

Response: *During the extensive public outreach efforts for this project, Mr. Fisher approached the project team to offer his knowledge of environmental activities and issues in the industrial and agricultural areas near the proposed project site. The project team reviewed Mr. Fisher's correspondence, met with him, and modified our feasibility analysis efforts to incorporate and address many of his concerns.*

Contrary to Mr. Fisher's statement that "many others" have warned of the high risk from this project, the initial and continuing opposition to the project has been limited. During our public outreach, other citizens initially expressed opposition to the project and concern about potential contamination from nearby industrial activities and those comments were considered in the analysis. After the analysis was completed, the project team discussed our findings with citizens who continued to have concerns, and while some of them continue to oppose the project, most of them were satisfied that our evaluation was thorough and the project would provide safe drinking water.

The results of the testing and analysis confirm the proposed groundwater supply is a safe, reliable, and viable alternative to the Cowlitz River, and both the state Department of Health and Department of Ecology have approved this project. The project team's highest priority is ensuring the community's water supply will be safe and reliable for many years. If the project team had any concerns about the future safety of the new water supply, we would not have recommended proceeding with the project.

To follow is a list of the facts that further support my opinion:

1. Industrial Zone Chemical Contaminants. Over the past century or more, there have been a long list of toxic or hazardous chemicals and materials used or generated by the various industries that have operated on land between the Columbia River and the proposed City wells. Many of these chemicals have been spilled or otherwise released to the environment through typical industrial practices over this period, either to surface or stormwater, direct to soils, and/or to groundwater. There are several documented incidents, in fact, involving environmental agency actions relating to such contamination (eg, pentachlorophenol, mercury, cyanide, oil, solvents, etc.) at some of these industrial sites. Prior to the 1970's before environmental regulations were established, there were no rules to prevent discharge of spent chemicals, oils, sludges, wastewaters, and other process wastes directly to the soils, unlined pits/ponds/ditches, direct to the Columbia River, to the Industrial Way ditch system, or even to groundwater. The list of potential chemicals released within the industrial zone is huge, and includes known carcinogens, mutagens, teratogens, acute/chronic toxicants, and endocrine disruptors. Most or all of these pollutants are bioaccumulators, and are very persistent or remain in the environment for long periods. All of these chemicals can cause significant risk to human health if ingested, and most are listed by EPA and/or regulated under the federal Safe Drinking Water Act.

Response: *Based on information from Mr. Fisher, the feasibility analysis was modified to include testing for many of the chemicals potentially used by industry near the project site.*

The analysis included samples for drinking water regulated chemicals, as well as other regulated and unregulated chemicals, and included more than 300 individual analytes. For example, methyl mercury, chlorinated phenolics, resins, and fatty acids were included due to the nature of the predominant nearby industries. In addition to the monitoring wells and test production well installed by the City, samples were collected from deep wells at the Chinook Ventures site (former Reynolds Aluminum site) that had been pumped at high rates for decades, and from the Puget Sound Energy Power plant that has been pumping continuously for several years. Methyl mercury and oleic acid/linolenic acid were found in the shallow groundwater at levels well below the criteria for protection of human health. However, no compounds related to industrial or agricultural uses were detected in the deep groundwater.

2. Thousands of Pilings. All major structures (including docks, piers, buildings, bulk tanks, silo's, etc.) that historically or presently operate within the industrial zone surrounding the proposed City wells are constructed on wood pilings. In order to provide proper support, these pilings have been driven deep into the ground down to bedrock or gravel layers (from 100' to 200' or more in the industrial zone, including in the Mint Farm Industrial Park). Collectively, there may be several thousand such pilings driven over the past century, nearly all of which are still in place. In fact, many of these piling were pressure-treated with Creosote (a petroleum/coal-tar mixture), an extremely toxic compound designed to inhibit biological degradation of the piling and extend structural life in the ground. All or most of these piling have been driven down to the aquifer (approximately 200' down) that is intended to become the water source for the new City wells. These piling serve as pathways or conduits for industrial contaminants from the past to migrate down into the city's target aquifer. Additionally, the creosote piling may leach their toxic contaminants (such as PAH's) directly to the groundwater aquifer. As stated in my previous comments to the City Council, the piling issue represents a veritable "pin-cushion" of potential pathways for surface contaminants to enter the aquifer. The existence of the piling and their potential to be conduits for surface contaminant migration to the aquifer are a fact, and represent an extreme risk.

Response: *The pilings used in the Longview area are friction piles – not piles driven to bedrock or even necessarily to gravel layers. While we don't have specific information on the old wood piling, given the structural limitations of wood piling, it is unlikely any piles were driven more than about 100 feet deep or penetrate into the deep aquifer. Even for the Puget Sound Energy power plant, which has heavy, rotating equipment requiring more precise tolerances than any of the equipment at the timber or aluminum plants, their steel piles were driven only 120 feet deep.*

Friction piles are supported by the friction developed on their sides from the soil in contact with the length of the pile. By design, the fine-grained soils seal against the piling due to the considerable lithostatic load on them, and the vibrations from driving the pile enhance movement of fine-grained soils to seal against the pile. This sealing would significantly limit, if not completely eliminate, vertical migration of fluids along the sides of the piles. Therefore, there will be very little to no vertical migration of water expected along the piles.

In addition, groundwater in the Mint Farm area has an upward gradient with the groundwater hydrostatic levels in the deeper aquifer higher than the shallow groundwater

levels. The shallow groundwater levels are controlled by the pumping for drainage by the Consolidated Diking Improvement District, while the groundwater levels in the deeper aquifer are controlled by the Columbia River. These hydrogeological relationships were modeled and confirmed by multiple lines of evidence as described in the Basis of Design Hydrogeological Characterization Report, and significantly limit the potential for contamination to reach the deeper aquifer.

Even if the old piles were driven into the deep aquifer, wood pilings are noted for being durable if kept continually wet. Most wooden pilings in the Longview area would be driven below the normal fluctuation of the groundwater table, with only small portions of the upper ends of the piles and the pile caps potentially above the shallow groundwater table. Any piles penetrating into the deep aquifer would be continually wet and not prone to degradation. Because of the strong connection to the Columbia, pumping at the Mint Farm Wellfield will produce only minor drawdown in the deeper aquifer, and none in the shallow groundwater. The drawdown from the Mint Farm Wellfield, based on the groundwater model, is about 6 feet in the deep aquifer near the wellfield, and one foot or less further away. Therefore, neither the shallow or deeper groundwater in area of any old piles will experience dewatering that could compromise the integrity of existing wood piles.

3. Industries in the Well Capture Zone. The City's consultant determined that the target aquifer for their new well will be recharged from the Columbia River, slightly downstream from the Chinook Ventures site (former Reynolds Aluminum)(see Kennedy/Jenks Draft Preliminary Design Report, March 2010, as posted on the City's website). This means that essentially all water drawn to the City's wells will travel from the Columbia River and under the entire industrial zone, before it arrives at the wellhead. Any pools or pockets of chemical contaminants now lying at the bottom of all the thousands of piling under the industrial zone will potentially begin to move over time toward the City's wells. The same consultant report also includes modeling and predictions of the time-of-travel for the water in the aquifer to reach the City's wells from various distances or radii out from the wells. According to the report, groundwater in the aquifer under the industrial zone will begin to reach the City wells within six-months to a year, once the planned pumping rate (approximately 15 million gallons per day) is started.

Response: *As shown in the Report, the capture zone for the Mint Farm Wellfield has a strong 3D component. The capture zone does extend underneath the locations of industries, but the deeper aquifer is overlain by 150 to 200 feet of fine-grained sediments that form a confining layer. The captured water travels at least 150 to 200 feet below the industrial areas, is separated from the industry surface activities by the confining layer, and is sourced by the Columbia River, not the shallow groundwater. A contamination source would need to reach the deeper aquifer to enter the drinking water supply, a highly unlikely scenario.*

The deeper aquifer is a very highly transmissive unit consisting of sand and gravel. Mr. Fisher is quite right about the transfer of contaminants in that, if "any pools or pockets of chemical contaminants now lying at the bottom" were present in the deep aquifer, they would be able to migrate toward the Wellfield. However, any "pools or pockets of chemical contaminants" would already be generating a plume and moving under non-Wellfield pumping conditions. The background hydraulic gradient in the deeper aquifer (without the

Mint Farm Wellfield pumping) is from the Columbia River, underneath the Weyerhaeuser and Chinook Ventures sites, across the Mint Farm area and to the northeast. This is based on groundwater level and isotope data and explained by the conceptual model presented in the Basis of Design Hydrological Characterization Report.

Most of the suspect activities at the nearby industries occurred prior to the implementation of environmental regulations beginning in the late 1970s. That means contamination from those sources has been present for 30 years or more, and any existing potential contaminant sources underneath the Weyerhaeuser and Chinook Ventures sites would have an existing plume extending under the Mint Farm. Sampling of the monitoring wells, Chinook Ventures well, and the Puget Sound Energy well would have detected the presence of an existing contamination source. It didn't.

A groundwater model analysis evaluated groundwater pumping conditions for the Wellfield at full buildout conditions (50-year demand), and also under two scenarios with assumed contamination: (1) contamination of the entire Mint Farm Industrial Park properties; or (2) contamination of the entire Chinook Ventures and Weyerhaeuser properties. In addition to the Mint Farm Wellfield pumping, the model included natural groundwater movement and other pumping activities in the same aquifer (for example Puget Sound Energy), to account for all groundwater movement in the deep aquifer, not just that caused by the Mint Farm Wellfield. Based on these analyses, the model did not identify any potential pathways for contaminants from the industrialized areas to the deeper aquifer. Because of the limited drawdown in the deep aquifer and no drawdown in the shallow groundwater anticipated for the Mint Farm Wellfield, additional pumping from the Mint Farm would not develop conditions that would be able to activate a contamination source that was not already in the deeper aquifer. The Dept. of Ecology and their technical consultant, Pacific Groundwater Group, reviewed the groundwater model and the results of its analyses, and concurred with the project team's conclusions.

4. No Uniform Confining Layer. According to the March 2010 Kennedy/Jenks report (as cited above) and also the Geotechnical Report by Landau Associates of June 2010 (as posted on the City's website), there is no uniform "confining layer" in the geologic soil profile in the Mint Farm Industrial area surrounding the City's wells. The City Council was lead to believe from statements by the K/J consultant that there was a uniform confining layer that would protect the future wells from any downward migration of surface contaminants. This is simply untrue. The above reports show clearly from all the well logs and soil borings that there is no uniform confining layer, only scattered lenses or soil layers that maybe slightly less permeable than others. Therefore, there is no real protection of the aquifer from future surface contamination migration. In reality, however, the significant near-term risk to well water contamination will come from pollutants already in the deep groundwater from the piling influences under the industrial zone.

Response: *The characterization of the confining layer as "only scattered lenses or soil layers that maybe slightly less permeable than others" is not supported by the hydrogeologic data from the Longview area. These data show that there is a thick sequence of fine-grained sediments and clay from 150 to 200 feet thick underlying most of the Mint Farm,*

Weyerhaeuser and Chinook Ventures sites. The areas where the confining layer is absent are north of the Mint Farm Wellfield site and west of Chinook Ventures. The distribution of the confining layer discussed in the Hydrological Characterization Report is based on multiple lines of evidence including geologic logs and groundwater data.

Based on our research of the contaminated sites in the Longview area and their regulatory reports, there are no existing plumes in the deep aquifer. Existing regulated sites consist of contamination which is confined to the shallow soils. Characterization of the existing regulated sites in the area does not support the notion that there is a migration pathway to the deeper aquifer, and our hydraulic modeling confirms that characterization. Pacific Groundwater Group followed up with the regulatory agencies regarding these sites and the current site regulators agree with this assessment.

5. Groundwater Age. According to the March 2010 K/J report, the basic quality of the groundwater in the target aquifer is very old compared to surface water (as measured in the bicarbonate concentration differences). This suggests that the groundwater under the industrial zone has been there a very long time, and has not moved or been flushed out, but remains fairly static. Further, this suggests that any contaminants that have migrated down the many pilings into the target aquifer over the past century may still be there, thus providing a significant risk of beginning to migrate toward the City's wells once pumping begins.

Response: *The discussion in the Hydrogeological Characterization Report regarding the bicarbonate data was to demonstrate that the Columbia River water had adequate residence time in the deeper aquifer. The Report notes that the shallow groundwater is consistent with water derived from precipitation that has not been exposed to other influences. In contrast, the deeper aquifer shows that the water has sufficient residence time for the water to equilibrate with the sediments. This discussion does not infer the water in the deeper aquifer is old, and in near stagnant conditions. In fact, the hydraulic modeling determined the water has continually moved from the Columbia River through the aquifer under natural conditions, regardless of any pumping scenarios. The existing groundwater data presented in the Report and discussed above refute the statement that "any contaminants that have migrated down the many pilings into the target aquifer over the past century may still be there." In addition to the highly unlikely scenario that contaminants have travelled down a piling into the deep aquifer, continual movement of groundwater in the aquifer precludes the formation of "pools" of contamination that might not have been detected in the groundwater samples taken as part of our analysis.*

6. Incomplete Risk Assessment. The January 4, 2010, Human Health Risk Assessment Report by K/J, as posted on the City's website, is based solely on one round of groundwater samples (less than twenty total) collected in October/November 2009 from some shallow and deep wells drilled in the Mint Farm Industrial Park area. Only a couple of samples were actually collected from the deep well in the vicinity of the City's proposed drinking water well. This well (labeled PW1) was test-pumped at a rate up to 5 mgd (approximately ¼ of the intended final pumping capacity), and the pumping continued for only 36 days. The analytical data from the before and after 36-day pumping showed no contaminants were present (except for arsenic and other minerals). However, as described above, potential contaminants from under the industrial zone

would not be expected to show up in the well samples until at least 6-months of pumping at or near the 15 mgd rate. Therefore, all that the screening-level sampling data demonstrates is there is no significant contamination in the test wells presently. Taking a very conservative (and incomplete) approach, the K/J report relates all their risk assessment conclusions on the one round of screening samples. They did not include a discussion of the huge potential risks that exist in the century-long contamination of groundwater under the industrial zone, especially in relation to the existence of the piling influences on potential vertical migration of surface pollutants downward to the target aquifer. In fact, the K/J Risk Assessment report deferred any discussion of the industrial zone effects to the K/J Environmental Site Assessment (ESA) Report, March 8, 2010, also posted on the City's website. However, the ESA Report (and ASTM Method 1527) is not designed to be a Human Health Risk Assessment document. The ESA Report merely lists the known contamination on a site based on agency files, and should also list the potential threat of past and/or present contamination or releases at a site. The K/J ESA Report only briefly lists the previous agency files dealing with a couple known pollutant releases in the industrial zone, and makes no mention of the century-long use of contaminant chemicals and the potential groundwater pollution from the thousands of piling on the site. Nor did the report reference the historical information on potential releases that I and other professionals provided to the city in a meeting on February 9, 2009. Granted, there is no way to clearly quantify the risk, but the report protocols for conducting such a Human Health Risk Assessment require that such non-quantifiable risks be included and discussed. The report should have at least stated what is known; ie, the industrial area is within the modeled capture zone of the wells, and any contaminants now residing in the target aquifer could show up in the well water within 6-months to a year after pumping starts. In my view, the human health risk assessment report is therefore significantly inadequate and was extremely misleading to the City Council.

Response: The Human Health Risk Assessment was based on two rounds of sampling (June/August and November 2009) of the deep monitoring wells. The Human Health Risk Assessment also included data collected from the Production Well before and after the pump test, as well as data collected from the Chinook Ventures and Puget Sound Energy groundwater wells, both of which have been pumping over multiple years.

Since the completion of the Human Health Risk Assessment, two additional rounds of groundwater monitoring have been conducted. Volatile and semi-volatile organic compounds were not detected in either testing event. Inorganic compounds, which may be naturally occurring, have been detected at concentrations less than screening levels. Current testing protocols can detect these contaminants down to levels of parts per billion. Even if there were pockets of contaminants "out there", and we have previously explained why that is highly unlikely, as Mr. Fisher points out, transport mechanisms would almost certainly have brought those contaminants in parts per billion concentrations into one or more of the many sampling locations. And as indicated in responses to earlier concerns, the confining layer, the lack of transport mechanisms to carry surface contaminants into the deeper aquifer, and the continual movement of groundwater in the aquifer, predicate that any existing contamination would have been detected at least at very low levels by our sampling program.

While the ESA Report is not a risk assessment, the report included the results of the Phase II investigation, and the soil and groundwater reconnaissance analytical data were compared to

values that are protective of human health (i.e., Washington State Department of Ecology cleanup levels and state and federal maximum contaminant levels for drinking water). All of this data supports the conclusion there is very low risk of contamination with use of the Mint Farm Wellfield.

7. NEPA FONSI Incomplete. Region X EPA issued a Finding of No-Significant Impact (FONSI) following their environmental review of the city's well project, August 13, 2010, as cited on the city's website. After review of this document, it appears EPA relied solely on the information provided in the May 2010 K/J Report and other reports listed on the city's website. The potential impacts to human health were not addressed directly, and there was no mention of the very real risks associated with locating the wells in close proximity to a complex, century-old heavy industrial zone. In my view, EPA needs to revisit the NEPA process for this project, critically read all the reports, and ask the obvious hard questions that directly relate to the human health risks associated with pumping groundwater from under a known industrial zone.

Response: *The National Environmental Policy Act (NEPA) review and issuing of the Finding of No Significant Impact (FONSI) is complete and in compliance with federal regulations guiding the Environmental Assessment (EA) for NEPA. The FONSI was issued in accordance with Environmental Protection Act procedures for complying with the National Environmental Policy Act 40 CFR Part 6. The key elements of the NEPA documentation have not only been reviewed by the EPA, but also were reviewed by the Washington State Department of Health, Office of Drinking Water, as required for projects funded by the State Revolving Fund Loan Program. The NEPA EA document complied with the Council on Environmental Quality (CEQ) regulations specific to NEPA including:*

Sec. 1508.9 Environmental assessment.

"Environmental assessment":

(a) Means a concise public document for which a Federal agency is responsible that serves to:

- 1. Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.*
- 2. Aid an agency's compliance with the Act when no environmental impact statement is necessary.*
- 3. Facilitate preparation of a statement when one is necessary.*

(b) Shall include brief discussions of the need for the proposal, of alternatives as required by section 102(2)(E), of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.

As stated above in Section 1508.9 the EA is to be concise and brief. Information in the Basis of Design, Hydrological Characterization Report was reviewed to prepare the EA. This review determined the risk to human health from drawing groundwater from the deep aquifer would

not constitute a negative impact. The Basis of Design report further discussed the potential for deep groundwater aquifer contamination. The Report examined the scenario of upper shallow soils (above the fine-grained confining layer) being contaminated. The outcome of the scenario demonstrated that contaminants will not cross the confining layer to the deep aquifer, and the deep aquifer remains a safe source for drinking water even if a hypothetical pocket of contaminants were to mobilize in the upper soils. Additionally, since the project facilities will meet or exceed all federal, state, and local drinking water regulations, the EA correctly concludes there is no impact to the risk to human health from the project.

The FONSI was issued in compliance with:

Sec. 1508.13 Finding of no significant impact.

"Finding of no significant impact" means a document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (Sec. 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it (Sec. 1501.7(a)(5)). If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference.

All applicable laws and rules of the United States of America and of the State of Washington were followed in the issuance of the FONSI by EPA.

8. The Real Project Costs. The City Council made their decision to go forward with the Mint Farm Well Project based predominantly on the perceived lesser cost compared to rejuvenating the existing Cowlitz River water plant, approximately \$20 million difference (although the Cowlitz River plant costs were only generally estimated). The real construction, operation and maintenance costs of going forward with the well project, however, may far exceed the \$20 million perceived savings. Not counted in the original estimates was all of the expense to continually sample and analyze all of the sentry wells and the production wells in attempts to detect the arrival of the contamination from the industrial zone. To be conservative, these wells will have to be sampled very frequently, and analyzed by a certified laboratory for a very long list of potential contaminants, both those listed on the federal/state drinking water lists, and those other unlisted suspected pollutants known to have been generated within the industrial zone in the past. The analytical costs alone could easily exceed the \$20 million in the first few years, and the city's rate-payers would be facing ever-increasing water bills far into the future. Of even greater importance is the potential cost associated with shutting the wells down once some contamination is detected. There would be huge costs involved in trying to find or develop adequate treatment technologies or equipment to remove the contaminants, and hopefully restore water service to the community in a reasonable amount of time. Experience in many other cities that have faced this problem indicate that finding such solutions takes many months to many years, and in some instances the wells must be abandoned all together. The problem here is the city has no back-up water system to put online if the wells fail. And, although there will be four wells in the city's planned system, all of the wells are clustered together, as close as the regulations allow, so contamination in one well will include all wells. The obvious other costs

associated with the failure scenario includes health-impact lawsuits, service disruption impacts on households and businesses, healthcare systems, and the list goes on and on. Additionally, the eventual Well-head Protection Plan that will be required by law for the Mint Farm well project will likely have the effect of preventing businesses from moving into the Mint Farm Industrial Park due to severe operating restrictions. The bottom line is the financial risk to the city from the potential contamination of the proposed wells is astronomical.

Response: Contrary to Mr. Fisher’s statements, the cost to rehabilitate the existing plant was evaluated in more detail than his term “generally estimated” implies. That cost was first generally estimated in the Pace Engineering Source Analysis report, and then later estimated in more detail by Kennedy/Jenks in their Longview Regional Water Treatment Plant Constructability Study. What is generally estimated is the cost to replace the intake facility and deal with the sedimentation problem, since no viable alternatives have been identified with any level of confidence. Thus, estimating the cost of replacing the intake structure and solving the sedimentation problem remains uncertain and a challenge.

With respect to the perceived future cost of staying on the look-out for contaminants entering the deep aquifer, the recommended frequency of sampling as part of a long term wellhead protection program is twice yearly – a prudent and diligent frequency. Two such testing events have already been conducted by the City at a cost of approximately \$30,000, and the results continue to indicate no contaminants of concern are present.

The chemical contaminants listed by Mr. Fisher in his correspondence to the City are not a massive list, and except for those already identified for cleanup by the regulatory agencies, none have been found at levels of concern anywhere in the tested areas within and around the Mint Farm Industrial Area, either in shallow groundwater, soils, or the deep aquifer. While all of the soils and shallow groundwater in the area have not been tested, the hydrogeological analyses confirm there is no transport mechanism for such potential contamination to reach the deep aquifer. The City should not spend the ratepayers’ money searching and testing for an extensive list of potential contaminants, many of which are unregulated, which have not been found by anyone, Mr. Fisher included. Had there been any evidence of such contaminants, the project team would have developed different recommendations, up to and including continuing to use the Cowlitz River. Mr. Fisher also fails to acknowledge the risk of potential contamination in the Cowlitz River from various sources. If we truly want to expand our sampling program beyond drinking water regulations to search for a wide variety of potential regulated and unregulated contaminants, we would need to implement the same philosophy on the Cowlitz River.

The Preliminary Design Report and its recommendations are the result of prudent engineering and environmental analysis as practiced by many modern American communities with health concerns similar to our community. Such efforts are not exercises in conjectural response without corroborating evidence. For the foreseeable future, no exotic treatment technologies to remove heretofore undiscovered contaminants will be needed. The source water for the new Mint Farm Regional Water Treatment Plant is the Columbia River – filtered through thousands of feet of sand and gravel. The probability of contamination from events in the river itself or from nearby industry is remote.

With respect to the wellhead protection program, it will be developed in accordance with the DOH rules and regulations, and implemented in a manner similar to the programs of other Washington state utilities using groundwater. We know of no utilities that have severely restricted business activities in their community by implementation of the law. In addition, industries and businesses must already meet strict requirements set forth to monitor for and prevent chemical spills, regardless of the location. The only foreseeable constraint to the Mint Farm Industrial Park area for future development is the likely prohibition of puncturing the confining layer – an easily managed restriction dealt with by using alternative foundation designs.

9. Fixing the Cowlitz River Plant. The Cowlitz River water plant has operated for over 30-years since the May 18, 1980, eruption of Mt. St. Helens, albeit not without some difficulty in dealing with sediments carried downstream by the river. Aside from the sediments hindering the river intake at times, the actual quality of the Cowlitz River water is excellent, and continues to provide a risk-free source of drinking water to the community, without worry of industrial contamination. In fact, the U.S. Army Corps of Engineers (ACOE) has been working on the sediment retention issue over the past several years. In the ACOE's June 2010 report, "*Mt. St. Helens Long-Term Sediment Management Plan Progress Report*", the author lists the use of jetties throughout the lower Cowlitz River as a method to enhance routing/flushing of sediment through the river system. The report includes charts and graphics to show the extensive use of pile jetties at strategic meanders in the lower river to speed-up the water velocity and keep the sediment moving, instead of forming river-clogging sand bars. I have had discussions with the river modeling engineers in the ACOE Portland District Office, Coastal and River Engineering Section, and they agree that the installation of some pile jetties on the opposite bank across from the present Cowlitz River intake could easily correct the problem of sand accumulation at the intake. The low-head pile jetties function by slightly constricting the channel width and increasing the river velocity under flow regimes that typically result from major storms and carry sediment bed-load downstream. The ACOE engineers said they have no directive or funding to perform the required modeling and design work for a site-specific project such as the Cowlitz intake, but they offered to provide all necessary river profile data they have collected for the river reach near the Cowlitz intake if another firm will undertake the task. In fact, during the summer of 2010, ACOE constructed a series of pile jetties and other structures in the upper Toutle River valley as a sediment-retention system. The city needs to fully evaluate the pile jetty concept as a viable method to solve the intake sedimentation problem through a specific modeling and design engineering project. The ACOE's June 2010 report, in fact, discusses actual jetty costs at approximately \$1,200 per lineal foot, which includes land acquisition costs. The city may be able to realize costs substantially less than that. For example, a series of three jetties, 200' or so in length, might cost \$700k. The point here is the concept is viable, and could be very cost-effective. Additionally, ACOE indicated they may be able to assist with new fish-screen design for the intake.

Response: *Reviewers of the rehabilitation strategy for the existing Cowlitz River plant cannot simply predict the engineering requirements and cost of river training structures without lengthy and costly modeling, as was reported in the constructability report. Managing river sediment in conjunction with complying with fish screening regulations is one of many*

significant challenging issues associated with rehabilitating the existing treatment plant and continuing to use the Cowlitz River as our water source.

As most know in the practice of engineering, advice from those who do not have to sign and stamp documents and take liability for the work product, can be remarkably diverse, friendly, supportive, innovative, and conjectural - devoid of any cost and risk responsibility. Conjecture and brainstorming is an integral part of the engineering process, but it should not be relied upon to make critical decisions at critical times without exercising due diligence. Corps of Engineers' staff would likely be the first to testify to the validity of that process. The City has done its homework, is not in a conjectural phase, and has adequate documentation to ascertain that the risks, final costs, and time delay to rehabilitate the existing plant and attempt to solve the sediment problem are relatively much greater than those for the new Mint Farm plant.

The City and project team are aware of various techniques to direct river flow and have consulted with various experts in river behavior, including Corps of Engineers staff, and there is disagreement amongst the experts regarding the potential success of various proposed techniques. In 2005, the City constructed two rock dikes in front of the intake structure, as designed by a river expert, and those dikes failed within one year. The Corps of Engineers has had limited success in managing sediment in the Cowlitz and Toutle Rivers; in fact, according to news reports, the dikes and diversion structures constructed recently on the upper Toutle River have failed and the Corps is taking remedial action to save them.

Permitting alone for replacing the intake structure would take a year or more. Permitting for a series of river-intrusive pile jetties could take two years or more since the process would require a full Environmental Impact Statement and an extensive Biological Assessment, including impacts on threatened and endangered anadromous fish species. Such a project is likely to receive objections from parties such as state and federal fish and wildlife agencies, local tribes, and others, and receipt of permits to construct dikes and other river training structures is not assured.

Finally, as noted in a previous response, Mr. Fisher not only fails to acknowledge potential contamination risks in the Cowlitz River, he claims the Cowlitz River is a "risk-free" source of water, free from potential industrial contamination. While there are no riverfront industries with the history of those near the Mint Farm site, many activities occurring in the Cowlitz River watershed upstream of the existing treatment plant could introduce chemical contaminants into the river. Our sampling program indicated the Cowlitz River, Columbia River, and the deep Mint Farm aquifer were all similarly free from contaminants. We must strongly disagree that the Cowlitz River is a "risk-free" source of water. In addition to potential chemical contamination of the river, dealing with the sediment in the river is certainly not a "risk-free" endeavor.

Conclusions and Recommendations:

The Longview City Council may have relied on misinformation, or misinterpreted information available to it in reaching their decision on January 28, 2010, to move forward with the Mint

Farm Industrial Park well system as the best alternative to the Cowlitz River plant sediment issue.

Based on the facts presented here, I strongly recommend that the City Council call a moratorium and stop the Mint Farm well project from further development, especially in light of the upcoming planned expenditure of approximately \$22 million for the treatment plant construction phase. The well project clearly represents an unacceptable potential risk to human health from the anticipated contamination from drawing groundwater under the nearby industrial zone.

Also, I highly recommend the City Council approve a project to model and design the application of pile jetties to modify the Cowlitz River velocity regime near the present intake as a permanent solution to the sedimentation problem, and continue to use the Cowlitz River as the city's drinking water source.

Response: Mr. Fisher has not provided facts to demonstrate use of the deep aquifer groundwater as a drinking water source would result in unacceptable risks to human health. In contrast, the data collection, analysis, risk assessment, and groundwater modeling that were evaluated by a number of engineering and environmental consultants, demonstrate that the use of the deep aquifer as a drinking water source would NOT result in unacceptable risks. There have been no data collected during the sampling and analysis that indicate the potential for unacceptable risks to human health.

In the interim, until the City Council can vote to stop the well project, the city needs to revise/edit the answers to some of the "frequently asked questions" section listed on its website: www.mylongview.com/publicworks/water-project-faq.html. Specifically, Question 3, "How do I know the groundwater won't become contaminated?" The answer has several misleading or untrue statements. In paragraph 1, there is a need to state that less than 20 water samples were taken to screen for contaminants to clarify any misunderstanding by the public that "14,500 tests" were done.

Response: No one can absolutely guarantee the groundwater won't become contaminated, just as no one can absolutely guarantee the Cowlitz River won't become contaminated. It is true that 17 individual deep and shallow groundwater sites were screened in the human health risk assessment, however, more than 20 samples were screened for contaminants. That screening included 2 samples collected from the Puget Sound Energy Well and the Chinook Ventures well, both of which have been actively pumping over multiple years, or decades for the Chinook Ventures well. In addition, samples were collected from the monitoring wells and the test production well both before and after the extended run (36-day) pump test. The Environmental Risk Assessment used the results of both the human health risk assessment as well as the groundwater model developed specifically for the Mint Farm aquifer, to evaluate both current and potential future risks associated with the use of the deep aquifer as a drinking water source. The evaluation indicates the potential for contamination of the deep aquifer is highly unlikely. It seems that only decades of pumping and sampling will convince Mr. Fisher there is little risk of contamination in the deep aquifer.

Several months ago, as part of the City's ongoing testing program, additional samples were collected from the deep groundwater aquifer and tested for the same analytes evaluated during

the environmental assessment. The results of these recent tests were very similar to the earlier results, indicating no change in the water chemistry and no chemicals detected at levels which would impact human health.

In Paragraph 2, the answer states that “sentry wells” will “allow the City several years advance notice to install additional treatment...” if contamination is detected. This is simply not true. The K/J March 2010 Report, Figure 3-1, Delineation of Source Area, shows that ALL sentry wells are located within the 6-month travel time zone. Therefore, the earliest detection from the most distant sentry well will only provide the city 6-months or less time to act once contamination is detected. The truth is contamination can easily flow between the sentry wells and go direct to the city production wells without ANY advance notice. In Paragraph 3, the answer states that “...a confining layer exists...that protects the deep aquifer from potential contamination at the surface. In addition, the deep aquifer is under pressure, which prevents potential shallow contamination from migrating into the deep aquifer.” These two statements are very misleading. First, as documented in the March 2010 K/J Report, and the Landau Report, there is no uniform confining layer. So there is no protection from surface contaminant migration.

Response: The statement regarding the confining layer is not consistent with the available hydrogeologic data from the Longview area. The presence of the confining layer has been long noted in the area, and the distribution of the confining layer was well documented in the Preliminary Design Report. While not absolutely impervious, the layer is highly resistant to the movement of fluids.

The groundwater elevation maps developed from the hydrogeological analysis show that sentry wells are located down gradient of the industrialized areas. Therefore, the sentry wells are properly located to detect potential contaminant plumes from the industrialized area. Groundwater contaminant plumes do not travel in a narrow path. Mr. Fisher’s own argument about contaminant transport supports the project team’s findings that if such contamination were in the aquifer, it would certainly have mobilized by now and be found throughout most of the aquifer and it would have been detected at low concentrations of parts per billion used in the testing program.

Second, groundwater pressure has little to do with migration of contaminants vertically in the water table. This is governed solely by specific gravity (density) difference between the pollutant compound and the groundwater. Contaminants more dense than water (specific gravity >1.0) will migrate down regardless of the pressure, whereas, less dense pollutants (like light oils) would float on the top of the water table.

Response: The statement above is incorrect. The primary factor that controls the vertical migration of contaminants is the character of the local geology. The presence of low-permeability zones, even if very thin, provides a strong resistance to vertical migration. In addition to the local geology, the vertical migration of contaminants is controlled by multiple factors including the hydraulic properties of the soil, degree of soil saturation, chemical reactivity, microbial activity, and the relative difference in groundwater pressure, or hydraulic gradient.

The presence of higher groundwater elevations, or pressures, in the deeper aquifer than in the shallower aquifer is an important hydraulic condition. This condition provides a mechanism that will tend to keep any contaminant plumes in the shallow groundwater.

Specific gravity is a factor primarily for a free-phase chemical release. A free-phase is a chemical that has not been dissolved in water, as opposed to a dissolved phase. A free-phase chemical release will migrate downward only if it is denser than water and only until it encounters low-permeability soil where the vertical migration would halt. Such a free-phase contaminant would encounter the thick confining layer beneath the industrial areas almost immediately, and its migration would be halted. Once in the dissolved phase, the other factors mentioned above are more significant than the specific gravity in controlling plume migration.

Question 4, “What is in the groundwater?” The answer makes no mention of the potential contaminants that may have been generated over the past century within the industrial zone. The public is being lead to believe that the only concern is with arsenic and some minerals.

Response: Over 300 analytes were included in the sampling and analysis of the deep groundwater. This is far more than what is required for a drinking water source. The list of analytes was determined based on the past industrial uses of the Mint Farm, including specific input from Mr. Fisher. No contaminants associated with past industrial uses were detected in the deep groundwater, and few were detected even at very low levels in the shallow groundwater.

Over the past 2-3 years, the city’s expressed concern during the entire process of considering the well project has been “we need to get this right”. Taking the slightest risk with the health of the citizens of this community because of perceived less cost is totally unacceptable. It’s time to accept the reality that there are known and unknown human health risks associated with the well project, even though those risks cannot be quantified at this point. No amount of additional sampling will provide adequate assurance that there is no risk; we simply won’t know until it shows up in our water. “We need to get this right” by focusing on the Cowlitz River as the city’s most viable, risk-free water resource option, and move forward accordingly.

Response: The Environmental Risk Assessment concluded that the current and future use of the deep groundwater aquifer as a drinking water source is unlikely to result in unacceptable risks. It is impossible to say that anything is “risk-free”, but through the use of sentinel well monitoring and a wellhead protection program, future risks associated with the use of the deep groundwater as a drinking water source can be mitigated.

Contrary to Mr. Fisher’s statements, the Cowlitz River is hardly “risk-free”. The most prevalent contamination of drinking water sources comes from biological sources such as bacteria and viruses, and surface water sources are highly susceptible to such biological contamination. Groundwater sources are generally very resistant to bacteria and virus contamination. For surface water sources such as the Cowlitz River, the EPA has increased testing requirements for viruses and is considering mandating a higher level of treatment. In fact, in our sampling for this project, the only detection of fecal coliform, which can be an

indication of fecal contamination, was in the Cowlitz River sample. Furthermore, the Cowlitz River is vulnerable to discharges and spills, including continuous discharges from wastewater treatment plants upstream, and significant volumes of hazardous chemicals being transported on the highways and railroads.

Over the past 2-3 years, the city's expressed concern during the entire process of considering the well project has been "we need to get this right". Taking the slightest risk with the health of the citizens of this community because of perceived less cost is totally unacceptable. It's time to accept the reality that there are known and unknown human health risks associated with the well project, even though those risks cannot be quantified at this point. No amount of additional sampling will provide adequate assurance that there is no risk; we simply won't know until it shows up in our water. "We need to get this right" by focusing on the Cowlitz River as the city's most viable, risk-free water resource option, and move forward accordingly.

Response: The project team and the City have gotten it right with the recommendation to construct the new Mint Farm Water Supply. Besides being the lowest cost option, the new Mint Farm Water Supply is also the lowest risk option.

Again, these opinions are my own, as a citizen and water quality scientist, and in no way reflect my position on the Longview Planning Commission.

Thank you for this opportunity to provide comment on this issue.

Respectfully,

Jim Fisher

Jim Fisher, CPEA, CHMM
President
Fisher & Associates, LLC

Enclosures:

Fisher, Jim. January 25, 2010. Comments Letter to City Council on City Drinking Water System Evaluation Project.

Fisher, Jim. February 4, 2009. Discussion document for meeting with City Public Works staff and consultants on proposed Mint Farm Well Project.

By reference: Various reports listed under the "Mint Farm Groundwater Project" on the City of Longview website at: <http://www.ci.longview.wa.us/publicworks/WaterProject.html>



Memorandum

February 19, 2014

TO: Longview City Council
Beacon Hill Water & Sewer District Commissioners
Bob Gregory, City Manager
David Campbell, Assistant City Manager
Dell Hillger, General Manager, Beacon Hill Water & Sewer District

FROM: Jeff D. Cameron, Public Works Director

**SUBJECT: Mint Farm Regional Water Supply Project
Response to Jim Fisher Letter Dated December 11, 2013**

On February 13, 2014, staff received a copy of a letter Mr. Jim Fisher submitted to the Longview City Council and Andre Stepankowsky at The Daily News on December 11, 2013. In his letter, Mr. Fisher objects to the Mint Farm groundwater supply and urges Council to return to the Cowlitz River, alleging the groundwater is not safe and was not adequately evaluated.

Mr. Fisher is a Longview resident and experienced environmental consultant with years of experience working with local industry. His concerns about potential contamination from nearby industrial activities were shared by everyone involved when the Mint Farm groundwater supply concept was first created and are precisely why city staff and various technical and environmental consultants spent four years vetting this project to ensure sustainability and, above all else, protection of human health. Throughout every phase of the project, project staff has gone beyond the standard practice of care to evaluate the City's options regarding continuing to use the Cowlitz River as a source or obtaining a different source of supply, as well as analyzing the distribution system water quality issues our customers are experiencing during the re-equilibration period after start-up of the Mint Farm water treatment plant.

During the feasibility analysis, project staff met with and welcomed input from Mr. Fisher concerning the industrial and agricultural activities that have occurred in the area and the types of pollutants that should be included in the analysis. Project staff collaborated with Mr. Fisher to develop an extensive analyte list for groundwater sampling, including a number of unregulated contaminants specific to local industry and previous agricultural activities. Project staff also included a number of unregulated contaminants not related to the local activities, to ensure the feasibility analysis adequately compared the water quality and risks related to using the Cowlitz River, Columbia River, or Mint Farm groundwater as the source of supply.

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Most of the concerns and conclusions Mr. Fisher stated in his December 11 letter have already been addressed in prior correspondence, which is attached for ease of reference in lieu of repeating the previous responses. Current responses have been inserted into appropriate sections of Mr. Fisher's letter, attached below.

We appreciate Mr. Fisher's concerns and his assistance to the project team during the feasibility study and pre-design report. However, it's apparent that Mr. Fisher and his experts disagree with and are unwilling to accept the conclusions of the City's various experts involved in analyzing and reviewing the feasibility of using the Mint Farm groundwater, and that he/they dismiss the validity of the study and evidence presented to determine the groundwater water supply is sustainable and safe. We disagree with his/their conclusions and continue to support the water supply recommendations and decisions. The Mint Farm groundwater supply was the subject of rigorous testing and analysis, peer review by other technical experts, review by the state Department of Ecology and their technical experts, and review by the state Department of Health, and it is safe to use as the source of the City's water supply.

cc: Craig Bozarth, City Engineer
Amy Blain, Project Manager
Andre Stepankowsky, The Daily News
Jim Fisher, CPEA, CHMM

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February 19, 2014

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Fisher & Associates, LLC

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www.fisherandassociates.net

December 11, 2013

To: Open Letter to the Longview City Council

Subject: Comments on Community Drinking Water Issues

As a concerned citizen of Longview, I would like to provide some facts related to the city's new drinking water well system, and also the Cowlitz River intake issue.

As several of you may recall, I provided a significant amount of scientific and technical information to the Council in meetings with staff, via e-mail, and testimony at Council Meetings from 2009 to 2011 pointing out the very high risks of abandoning the Cowlitz River and drilling the Mint Farm wells, as a new source of community drinking water (attached is information provided for the public record from my testimony at the Council Meeting on February 4, 2011, my letter to the City Council of January 25, 2010, and comments to City staff at a meeting February 4, 2009).

You may also recall that the February 4, 2011, Council meeting was when a vote was taken to proceed with funding the installation of the Mint Farm well system. Regardless of the large amount of information provided on the high risks and potential negative impacts on water quality and future health of the community from this well water, the Council voted to approve construction. Those who approved were: Mayor Anagnostou, Weber, Botero, Melink, McKinster, and Wallace. Don Jensen, now Mayor, was the only one who voted No, and stated he felt putting city drinking water wells in such a heavily industrialized area was not a good idea. As it turns out, he was right.

In the information provided to the City and the Council by me and several other scientists, engineers and local physicians, it was made clear that the potential high risks were based on an array of known facts, not speculation. Below is a summary of those facts, repeated here especially for the new Council members:

1. Well water hardness. The test well and other existing industrial wells in the Mint Farm showed hardness levels at least three to four times higher than the Cowlitz River. I warned City staff that distributing this new water throughout the community would cause fouling problems and staining of people's sinks, showers, faucets, windows, dishes, cars, etc, and cause odor and

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Response to Jim Fisher Letter Dated December 11, 2013

color problems throughout the system. As predicted, this has happened and produced a huge impact already on users of the new city water.

Response:

Mr. Fisher previously expressed concern about taste, odor and color issues based primarily on the use of untreated groundwater at the Reynolds Aluminum facility. Those issues are not related to hardness, but are related to iron and manganese in untreated groundwater. The Mint Farm treatment plant was designed to remove iron and manganese to meet state Department of Health secondary maximum contaminant levels established to address those issues. Mr. Fisher did not predict or acknowledge the need for a period of re-equilibration whenever a source of supply is changed, and is attributing water quality impacts contributed by the distribution system to the source water. Other than the white spotting, the predominant water quality impacts we are experiencing are indicative of the condition of the distribution system and a greater than expected re-equilibration period and impact. Mr. Fisher also states he predicted fouling problems due to the hardness of the well water. The project team has determined the staining experienced by customers is caused by iron and manganese being released from accumulated distribution scales, and white spotting is primarily from naturally-occurring silica, not from hardness. The Mint Farm water is moderately hard, and hardness is a minor contributor to white spotting.

2. Well water contamination sources. A historical summary of the many potential contaminants and pollutants known to have been used, spilled, leaked, drained, buried or otherwise existed on and along the entire industrial zone along Industrial Way over the past century was provided to the Council and City staff. Some of the more serious areas and types of these pollutants that could influence well water drinking quality in the future were overlooked and/or not even considered in the Risk Assessment report prepared by the City's consultant, Kennedy/Jenks (report is posted on the City's website). The report did not assess the potential impacts from the tens of thousands of piling that still exist along the entire industrial zone, which were drilled from the ground surface down into the gravel aquifer to support every major industrial building or structure from the early 1900's to the present. That is the aquifer from which the new wells draw their water. Those piling, many of which were treated with Creosote (a very toxic chemical preservative), essentially provide conduits or pathways for any pollutants or contaminants on the surface down to the aquifer. The Creosote piling provide a direct source for leaching toxic contaminants into the well water aquifer. This fact was totally ignored by the consultant, who stated the aquifer was protected by the layer of fine silts and sediments above, and therefore no surface contaminants could migrate down into the aquifer. In fact, the industrial zone is a veritable "pin-cushion" full of existing and old pilings that have been punched through and permeated the surface sediment layers creating a huge potential to contaminate our new water source.

Response:

Piling does not penetrate into the source water gravel aquifer and is not a conduit for contamination to enter the aquifer. See prior City of Longview memorandum dated February 3, 2011, item 2, page 3 of 16.

Mr. Fisher is ignoring key evidence of the quality of the confining layer which protects the aquifer and the hydrogeological characteristic of upward flow of groundwater in the shallow aquifer in the industrial area. In addition to the City's testing, Anchor QEA is under contract to ALCOA to identify the extent of contamination and recommend cleanup plans for contaminants at the Millennium Bulk Terminals site. Anchor QEA's testing has confirmed the City's determination that groundwater in the shallow aquifer flows upward rather than downward. In addition, both the City's and Anchor QEA's testing found no evidence of contamination in the deep aquifer groundwater wells located at the ALCOA property, despite decades of high rate pumping from those wells when Reynolds Aluminum was in operation.

3. Groundwater flow direction. The consultant's groundwater modeling study report shows that the Mint Farm drinking water wells draw water from its recharge source area, which was identified as coming from the Columbia River. The detailed map in the report shows the recharge area originates in a deep water area in the river near the old Reynolds Aluminum dock upstream from Barlow's Point. The drinking water wells pump and draw water into the aquifer via the bottom of the river, and it flows slowly underground in the gravel layer toward the wells. A broad "fan-shaped" flow pattern is created as the water travels from the river, under the former Reynolds plant, the Weyerhaeuser Plant, and even along the abandoned Radakovich landfill, as it heads toward the wells. And, it flows through all of the old pilings that exist in the aquifer between the river and the wells along the way. The report showed that it would take between 1 to 2 years for groundwater under the industrial zone to reach the new wells. It has been approximately eleven months since the wells were turned on (January 2013).

Additionally, another potential contamination fact was overlooked. There are two very large industrial wastewater discharges into the Columbia River upstream of the drinking water well recharge zone near the old Reynolds site. One is from the Weyerhaeuser site and the other from the Keystone paper mill. Each discharges around 30 to 40 million gallons per day of treated pulp mill effluent under their respective NPDES permits. The Columbia River is influenced by tidal effects in this area, with an average of two incoming and two outgoing tides per day. This means that during two 6-hour incoming tidal events each day, the mill effluent discharges will pool-up or circulate in the deep river area where the Mint Farm wells get their recharge water for the aquifer. There is significant potential for pulp mill effluent mixed in river water to be drawn into the deep aquifer that supplies the city's drinking water. Twice per day; every day. And, these mill effluents are not required to be treated to drinking water standards.

Response:

Again, the groundwater does not “flow through all of the old pilings” because the pilings do not penetrate into the gravel aquifer.

Mr. Fisher incorrectly states the influence of the tides. The tides raise the level of the river because it has to overcome the higher water level in the ocean; but the river never stops flowing toward the ocean and does not “pool up” within the recharge area.

The Preliminary Design Report (PDR) did not specifically address outfalls on the Columbia River but they were not overlooked as suggested. Kapstone, Weyerhaeuser, Millennium Bulk and the TRWWA all have outfalls on the Columbia River upstream of the aquifer recharge area delineated by Kennedy/Jenks Consultants. Effluent streams behave similarly to potential contaminant spills - the vastly greater volume of flow in the river dilutes the discharge and carries it downstream past the recharge area. These discharges do not contain sufficient quantities of heavy, high specific gravity pollutants to settle to the bottom of the river bed. The potential for pulp mill effluent to be drawn into the aquifer is insignificant given the dilution and mixing that occurs in the river, and the vastly greater volume of river flow to carry the diluted effluent downriver past the recharge area. And the argument that the effluent is not treated to drinking water standards is a false argument – the Columbia River and the Cowlitz River themselves do not meet drinking water standards.

Mr. Fishers’s concern about effluent streams is a perfect example of the inherent protection afforded by a groundwater source as compared to a surface water source. The City’s surface water intake structure on Fishers Lane is located downstream of nine often overlooked wastewater treatment plant discharges on the Cowlitz River, which is also tidally influenced. These flows do not pool around the Cowlitz River intake during incoming tides, but do make the water supply increasingly more vulnerable to cryptosporidium, giardia, pharmaceuticals and “emerging contaminants” associated with wastewater discharges and surface water sources.

4. Groundwater “Sentry-Well” Monitoring. In order to give some type of early warning of contamination being drawn from the industrial zone toward the Mint Farm wells, the City installed a series of deep and shallow monitoring wells at various locations between the industrial zone and the drinking water wells. This in itself is a signal that the City knew there may be potential risks of contamination in the aquifer from the industrial zone history, even though the consultant stated there was little or no risk in their report. These monitoring wells are ONLY sampled once every six months, with the first sampling (since the drinking water wells went into operation) occurring in July 2013. The second sampling should occur in January 2014. A review of the July data set showed the Arsenic in Deep Well #8 has increased to 11.9 parts per billion (ppb) (EPA standards limit Arsenic to 10 ppb). Also, Deep Well #6 showed detectable levels of Diquat (1.1 ppb) and Paraquat (1.5 ppb), both very toxic herbicides (weed killers). This may be an indication that the groundwater in the aquifer is being drawn toward the drinking

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water wells as predicted, and the detection of these contaminants (and possibly others) are already moving toward the drinking water wells. Sampling at 6-month intervals is not sufficient to give the City enough warning to take action to install emergency treatment in time for whatever contaminants show up, before having to legally shut down the wells. And, the City has no backup system to provide adequate drinking water if the wells become contaminated.

Response:

The monitoring wells were not installed solely as an early warning system; their primary purpose was to provide data to determine the feasibility of locating the groundwater supply in the Mint Farm area because the project team initially had prudent concerns about aquifer productivity and the risk of contamination of the aquifer. The project team concluded there is little risk of contamination only after testing water from these wells on numerous occasions. Further, the project team did not state "no risk". No water supply - groundwater or surface water - is risk free; even sources in undeveloped rural or forest areas have some risk. The fact that the initial test wells have been turned into sentry wells and incorporated into the City's Wellhead Protection Program indicates that staff is proactively managing its aquifer resource.

The monitoring wells are sampled at 6-month intervals because there is no physical evidence to support the need for more frequent sampling. Each sampling event takes staff 2-3 days to collect, laboratory analysis costs approximately \$15,000 and takes a month or more to obtain results (radionuclides test results can take 2-3 months). More frequent sampling is not practical or justified; the additional cost would not result in reducing the already low risk level.

The July 2013 sampling event identified total arsenic at a concentration of 11.9 micrograms per liter (ug/l) at monitoring well DW-8, which is just above the Maximum Contaminant Level (MCL) of 10 ug/l. This is slightly higher than the 9.17 ug/l result in June 2009 and the 11.3 ug/l result measured later in November 2013. All results are within normal variations based on water variability, sampling method, temperature, hold time, test method, etc. Monitoring well DW-8 is on the northern boundary of the groundwater flow path serving the Mint Farm wellfield and does not represent the majority of water pumped from the wellfield. Further, the fact the Arsenic level in the test well water exceeds the MCL is irrelevant; the MCL applies to treated drinking water and the treatment plant consistently removes Arsenic to a level of 2 ug/l in the finished drinking water.

Low level detections of diquat and/or paraquat are sporadically observed in monitoring wells along the CDID ditches at concentrations less than 1.5 ug/l. This is an order of magnitude below the MCL of 20 ug/L for diquat; no MCL exists for paraquat. Re-testing does not show a repeatable positive result; one of the control blanks also tested positive for diquat; and the occasional detections are attributed to herbicide use for vegetation control along the ditches and the potential for human error when collecting the sample.

5. Fortifying Drinking Water with Phosphates. This is a bad idea and essentially only a “band-aid” attempt at stabilizing scale in old distribution piping. Addition of another “hardness”-related chemical will only exacerbate the problems of water hardness addressed above; staining, water-spots, valve/faucet failure, scale formation in household fixtures, etc. Additionally, adding phosphates to the water may increase human health issues related to osteoporosis, electrolyte interference, malabsorption of Magnesium/Calcium/Potassium, etc., and have another adverse health effect similar to drinking many carbonated sodas (such as colas, etc.) every day. The citizens of Longview should not have their water fortified with Phosphates as a way to address a really bad drinking water source decision and problem in the first place.

Response:

Phosphates were evaluated as a way to address a distribution system problem, not a source water problem. However, the project team is not recommending phosphates be implemented at this time.

Use of phosphate for corrosion control is common practice and many water purveyors have successfully implemented it, including the City of Kelso at one time. Many different types of ortho and poly phosphates are NSF International certified for use in drinking water. The project team was evaluating doses of 3-4 mg/l of a blended phosphate - well below any NSF standard. Additionally, the Food and Drug Administration considers phosphates to be generally recognized as safe as a food additive. The typical phosphate levels found in a drinking water are many times lower than the levels found in the average American diet. For example, a person would have to drink ten to fifteen liters of water to equal the amount of phosphates in just one can of soda.

Phosphates are primarily used to inhibit corrosion in water system piping and to prevent oxidation and precipitation of certain water constituents. They are not considered a “hardness-related chemical” and there is no evidence phosphates would exacerbate water hardness.

6. Cowlitz River Intake. The only problem with the Cowlitz River as a continuing source of drinking water for the community was the occasional sand accumulation near the intake, which required some spot-dredging to keep water flowing into the intake. I provided the City with a workable solution to the sediment accumulation problem, and personally discussed the potential efficacy with Army Corps of Engineers (ACOE) in Portland. Simply stated, the idea was to install two low-head piling jetties opposite the Cowlitz River intake on the Kelso side of the river. The jetties would extend from the bank to approximately mid-river, and would function to slightly constrict and speed up river velocity along the bank near the intake. This very slight increase in velocity would effectively keep sand from settling in front of the intake. Problem solved. ACOE staff said such a system would likely solve the problem, and even offered to help with the modeling and engineering. City staff ignored the idea. In fact, ACOE published a report (June 2010) on how to address the long-term sediment accumulation issue in the lower Cowlitz River, and the use of multiple low-head jetties throughout the lower Cowlitz was offered

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as a viable solution. The report even includes maps of potential jetty placement locations to “route” the sediments through the lower river by increasing river velocity, and effectively “scouring” the sediments out of the system. Recently, I read that the City wants to retain the Cowlitz River intake and reconstruct pumps and piping to use Cowlitz River water to refresh water in Lake Sacajawea. Why not go a step further and restore the intake, pumps and piping to resume pumping drinking water from the Cowlitz. Given the right approach and consultations with WDOE, ACOE and NOAA/NMFS, I’m sure approvals can be gained to restore the city’s drinking water system from the Cowlitz, contrary to speculation by City staff that it is not possible (as recently reported in the TDN). This would essentially solve both problems; restore our drinking water and alleviate most of the distribution piping problems related to groundwater chemistry (and prevent future toxic contamination), and allow resuming the pumping of Cowlitz River water to Lake Sacajawea.

Response:

See prior City of Longview memorandum dated February 3, 2011, item 9, page 11 of 16.

Additionally, the March 2010 listing of eulachon (smelt) as a threatened species under the Endangered Species Act significantly increases the challenge of modifying the intake and continuing to withdraw water from the Cowlitz River. Further, the ACOE has not experienced much success controlling sediment on the Cowlitz River. In addition to the attempts noted in the February 2011 memorandum, the ACOE dredged a significant volume of material from the mouth of the Cowlitz River to remove sediment accumulation that was acting as a weir and raising water levels upstream in the river, and they dredged a large sump at the mouth of the river. The intent of the sump was to increase the velocity of flow in the river just upstream to scour sediment and deposit it into the sump. That theory failed to work. Controlling sediment in the Cowlitz River has not yet been successful, and assuming that it will be in the future is risky.

Conclusions and Recommendations:

The City’s decision to install the Mint Farm well field was an extremely bad idea, and avoided adequate warning and cautionary information provided in several meetings, letters and testimony in 2009 and 2010 from many concerned scientists, engineers and health professionals.

The City’s consultant ignored or overlooked information on significant potential contamination risks from the existence of thousands of pilings driven into the aquifer, and completely overstated any potential protection of the aquifer from overlying silts/sediments, thus misleading the City to conclude there was minimal risk.

The groundwater modeling by the consultant shows the drinking water originates in the Columbia River and recharges the aquifer near the old Reynolds dock area. Any contaminants that have leached into the aquifer from the industrial zone, either via old piling holes, from Creosote pilings directly, or other pathways, will enter the aquifer and reach the new wells in the

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future (perhaps within the coming year according to the modeling report's time of travel estimates). Semi-annual sampling of the Sentry wells is inadequate to provide early-warning signs, and show contamination may be "on the way" already. Monthly sampling would be a minimum in my view.

The Cowlitz River intake and drinking water plant should be restored to provide the city's primary source of drinking water, and to keep Lake Sacajawea refreshed, as before. A full engineering study (by a competent, new, non-local firm) should be commissioned as soon as possible to determine the cost and path forward to making that happen. This should include the installation of two or three piling jetties in the Cowlitz to assist in keeping sediments from accumulating. Fear of potential agency approvals and permitting should not be an excuse for launching the restoration effort. Nor, should the potential cost of the restoration be a deterrent, since the cost of LITIGATION of a class-action law suit for health impacts to the citizens by the present (and future) well water quality problems may be orders of magnitude higher. In fact, many citizens have already begun to suffer skin rashes and other health effects from exposure to the new drinking water, and many other complaints as reported in recent TDN articles and social media websites.

The risks of significant negative impacts to the community from the Mint Farm well system are the same as I and many other professionals presented before the City installed the wells. Except, now the citizens are already suffering from the first prediction: high hardness effects, with no end in sight or affordable remedy available to the city. The basic water chemistry of the well water will not change over time and will have the same impacts forever! The larger, more significant impacts from toxic contaminants in the well water may already be flowing toward the wellheads within the coming year or so. What then? There is no backup! We'd have been better off to drill wells in the garbage dump on Tennant Way, or haul our drinking water from wells at Hanford! It's time for a new direction and decisive action. The Right Direction is to return to the Cowlitz River!

Response:

Mr. Fisher overstates the risk to the groundwater supply, alleges the project team ignored information, and simplifies and understates the challenges associated with continued use of the Cowlitz River. The project team thoroughly evaluated water supply options and the risks to the groundwater supply from existing and potential future contamination, and rejects Mr. Fisher's contention that the evaluation and recommendations were flawed.

Thank you for this opportunity to provide comments on this issue.

Sincerely,

Jim Fisher, CPEA, CHMM

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February 19, 2014

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Response to Jim Fisher Letter Dated December 11, 2013

Attachments:

- .Testimony at City Council Meeting Public Hearing, February 10, 2011.
- .Letter of Comment to City Council and City Staff, January 25, 2010.
- .Discussion materials for City Staff comment meeting, February 4, 2009.