Idaho Public Utilities Commission
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Dean J. Miller
McDEVITT & MILLER LLP
420 West Bannock Street
P.O. Box 2564-83701
Boise, ID 83702
Tel: 208.343.7500
Fax: 208.336.6912
joe@mcdevitt-miller.com

Attorneys for Applicant

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF UNITED WATER IDAHO INC. FOR AUTHORITY TO INCREASE ITS RATES AND CHARGES FOR WATER SERVICE IN THE STATE OF IDAHO	**Case No. UWI-W-04-04**

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

DIRECT TESTIMONY OF SCOTT RHEAD

1 Q Please state your name.

2 A. Scott Rhead.

3 Q. By whom are you employed and in what capacity?

4 A. United Water Idaho ("United" the "Company") as Managing Engineer.

5 Q. What are your duties and responsibilities in your capacity as Managing Engineer?

6 A. I manage all activities of the Engineering group. These responsibilities
7 include strategic planning, capital budgeting, engineering design, information
8 technology, water quality and construction management for capital
9 improvements.

10 Q. Please describe your professional training and experience.

11 A. I received a Bachelor of Science Degree in Civil Engineering from Idaho
12 State University in 1972. I was employed by Forsgren Consulting
13 Engineering from 1975 to 1990 designing and managing a variety of water
14 and waste water municipal improvement projects. I joined United in 1990.
15 Since then I have had diversified responsibilities in both the Engineering and
16 Production departments. I am a registered professional engineer in Idaho,
17 Oregon, Washington, Utah and New Mexico. I am also a certified Idaho
18 Water Treatment Operator Level I.

19 Q. What is the purpose of your testimony?

20 A. The primary focus of my testimony is to discuss the Company's decision to
21 construct the Columbia Water Treatment Plant (CWTP) and operating
22 expense changes as result of CWTP. I will also discuss other significant

1 capital additions planned between August 1, 2004 and May 31, 2005. These
2 capital expenditure additions are indicated on Exhibit 8.
3 Q. Where is the Columbia Water Treatment Plant located?
4 A. CWTP is located at 6056 E. Columbia Road in an area known generally as
5 the Columbia Bench Service Level (CBSL).
6 Q. Are there unique water supply considerations in Southeast Boise where the
7 plant is located?
8 A. Yes. During 1994, the Idaho Department of Water Resources (IDWR)
9 designated a significant portion of Southeast Boise as a ground water
10 management area (Southeast Boise Groundwater Management Area –
11 SBGMA). As a result of the designation, additional groundwater
12 appropriations from within the Boise-Fan Aquifer, which underlays the
13 SBGMA, are essentially impossible to obtain. Parties interested in
14 developing additional groundwater supplies from within the SBGMA are
15 required to furnish sufficient technical data to show that water is available,
16 that existing users will not be injured and that depletion of the aquifer will
17 not be increased. Due to a history of declining water levels in the then
18 United wells (Oregon Trail and Gowen), and the establishment of a
19 groundwater management area, it is highly unlikely that future municipal
20 groundwater development in this area will be possible.
21 Q. Please describe the events leading up to the SBGMA designation.
22 A. In the early 1990's, the J. R. Simplot Company (Simplot) was developing
23 sub-divisions in the Columbia Bench area and had filed an application with

1 the Idaho Department of Water Resources for the drilling of new wells for the
2 purpose of irrigating a golf course. United filed a protest of this application
3 as United had observed declines in water pumping levels from its existing
4 Gowen and Oregon Trail wells. United believed that new water diversions
5 could not be added without injury to existing supplies. This action ultimately
6 led to Simplot's withdrawal of the application. These events also caused
7 United and others to more closely evaluate the availability of water for this
8 particular area of Southeast Boise. The other major water user in Southeast
9 Boise is Micron Technology, Inc. (Micron).
10 Q. What else was occurring at the time?
11 A. Coincidentally, water level recorders were placed on two observation wells
12 completed in the subject aquifer. The results of the measurements were
13 troubling. They showed sharp annual declines in water levels due to pumping
14 from the existing supplies, and called into question the possibility of adding
15 more wells in the future. As a result of these efforts, United filed an
16 application with the Idaho Department of Water Resources (IDWR) for the
17 establishment of a groundwater management area in Southeast Boise, in
18 October of 1993. In October of 1994 the application was approved. Because
19 of the groundwater management designation, IDWR will not permit
20 additional groundwater appropriations in the Southeast Boise service area.
21 Q. What efforts did the Company and other water users undertake in response?
22 A. The groundwater management declaration placed United, Simplot and
23 Micron in a position where future development or, in Micron's case, added

1 manufacturing capacity, was in jeopardy. The initial step toward the
2 solution, developed jointly between United and Micron, was The Southeast
3 Boise Water Supply Project, initiated in 1995. United and Micron jointly
4 constructed seven miles of 24-inch pipeline, drilled two new wells, tied in a
5 third existing well and constructed a 3.0 million gallon water storage
6 reservoir. A fourth well was added a few years later. The well field is named
7 the Ten Mile Ridge Wells. The combined capacity of these four wells is
8 approximately 8.0 million gallons per day (mgd). The objective of this
9 project was to reduce groundwater production from within the groundwater
10 management area to sustainable levels. Both of United's major production
11 wells within the SBGMA (Gowen and Oregon Trail) were transferred to
12 Micron pursuant to the project. As part of the Southeast Boise Water Supply
13 Project, the Ten Mile Ridge wells were constructed as replacements to offset
14 the loss of production from the Oregon Trail and Gowen wells located within
15 the groundwater management area. Thus, by minimizing groundwater
16 production within the SBGMA, the aquifer underlying this area would have
17 the chance to recover and annual groundwater declines would be curtailed to
18 more sustainable levels.
19 Q. Is the Southeast Boise Supply Project a long-term solution to the problem?
20 A. No. The Southeast Boise Water Supply Project has provided an answer to
21 the supply problems in the area for the past ten years. However, growth
22 already occurring in the area has put a significant strain on this system. In
23 the summers of 2001, 2002 and 2003 it became difficult to maintain water

levels in the Gowen and Columbia reservoirs—the two major storage reservoirs feeding Southeast Boise. During peak water demands these reservoirs supply water to customers when demand is in excess of well supply capacities. The inability to maintain these reservoirs at normal operating levels is the result of insufficient ground water supply in this area of United's system. These reservoirs also provide critical fire protection supply for the industrial facilities at Micron and water customers in United's Gowen service area.

The Southeast Boise Water Supply Project stopped the depletion of a vital groundwater resource and deferred the need for new water supplies in Southeast Boise, but a more permanent solution to the need can no longer be deferred. Immediate source of supply additions are required in Southeast Boise to assure peak customer demands are met and system operating pressures are maintained. This is further discussed and explained in later testimony.

Q. In light of the limited capacity of the water supply project, what other options did the Company evaluate?

A. During 1997, United hired Montgomery Watson Americas, Inc. to complete a Water System Master Plan. One objective of this project was to assess future water supply requirements over a twenty year planning horizon. United engineers and operational staff worked together to evaluate water supply alternatives for Southeast Boise.

First, the master plan evaluated the possibility of an expansion of the Marden Water Treatment Plant. It was determined that expansion of Marden is not feasible to the extent necessary to provide adequate supply capability for Southeast Boise. Expansion to any great degree is limited by the hydraulic infrastructure of the plant and the site dimensions. Furthermore, any additional capacity that could be developed at Marden would be required to meet existing and future customer water demands within the Main Service Level. The Main Service Level supplies the downtown corridor and areas north and west of the Boise River which also is limited for future groundwater development. Thus, United determined that expansion of the Marden Plant is not a feasible solution.

Q. What other options were considered?

A. Also examined was the possibility of moving groundwater into the Groundwater Management Area from other well facilities developed as part of the Southeast Boise Water Supply Project, discussed above. However, future development in the region south of the airport will erode the capability for these wells to provide supply for Southeast Boise. Water levels in the Ten Mile Ridge well complex have declined but reached a stable equilibrium at current pumping rates. Development will most certainly occur in this area over time and the aquifer yield must be preserved to accommodate this future growth.

Q. Did the company evaluate the possibility of drilling additional wells?

1 A. Yes. United also considered the possibility of drilling more wells in the
2 Columbia Service Level. Observation from existing operations indicate the
3 existing well capacity is near the limit of the safe yield for this aquifer
4 system. In other words, additional wells would likely aggravate pumping
5 water levels. Thus, as new water demand occurs in the Ten Mile region,
6 progressively less water will be available for export to the Ground Water
7 Management Area. The aquifer system has sufficient safe yield for producing
8 the supply required to serve contiguous development with wells located on
9 approximately a one-mile grid. United's experience indicates the aquifer
10 system is not strong enough to supply both the immediate vicinity and
11 produce water for export to another area. This leads to the inescapable
12 conclusion that construction of a surface water treatment plant is the only
13 feasible solution.
14 The master plan also concluded that the development of a surface water
15 supply was the best alternative in meeting the source of water supply
16 requirements of Southeast Boise. The master planning document concluded
17 that United should proceed with the development of a surface water treatment
18 plant in the Columbia Bench Area.
19 Q. Based on this analysis did United begin taking steps toward the eventual
20 construction of a surface water treatment plant in southeast Boise?
21 A. Yes. As the Commission is aware, United constructed the Boise River
22 Intake Project, consisting of 2900 feet of 30 inch discharge main through the

Surprise Valley Canyon wall cut for Highway 21 and a river diversion structure.

Q. Why was the Boise River Intake Project constructed in advance of the water treatment plant?

A. The decision to construct was explained to the Commission in Case No. UWI-W-97-6 and was summarized by the Commission as follows:

> The Company's decision to go forward with the river intake project at this time, it states, was based on a number of factors: (1) opportunity to utilize an existing diversion, (2) avoidance of perceived legal challenges to a new diversion, (3) opportunity to join and share construction costs with Micron Technology, J.R. Simplot Company and Surprise Valley L'td Partnership, who independently were working on a proposal to upgrade the existing river diversion, (4) timing of construction dictated by forces over which United Water did not have control—Micron/Surprise Valley needed water by spring of '98; mandate of Idaho Department of Transportation and (5) its obligation to serve. Order No. 27617.

Q. Did the Commission allow the Boise River Intake Project in rate base at that time?

A. No. As I understand Order No. 27617, the Commission believed it was constrained by Idaho Code 61-502A, which prevents a return on plant not currently used and useful, except in cases of extreme emergency.

Q. Did the Commission find that construction of the Boise River Intake Project was imprudent?

A. No. To the contrary, it found that construction of the project was a good business decision:

> We find, however, that the Company's decision to install facilities

> now may be of future benefit to its customers. We do not wish to discourage the Company from making decisions that make good business sense. Certainly, in this instance, the opportunity to share construction costs and utilize an existing diversion with others was an incentive to action. Order No. 27617.

Based on this finding, the Commission allowed amortization of the project through depreciation so that United would receive a return of, but not a return on, its investment. The Commission, it appears to United, has endorsed the concept of constructing a surface water treatment plant in southeast Boise.

Q. Please provide a summary of overall customer growth in the last 20 years.

A. The United system has experienced a very steady and strong expansion. Year-end customers (exclusive of private fire) have increased from 40,432 in 1985 to 73,332 in 2003. This is an average annual increase of approximately 3.5%.

Q. Please list United's overall peak day demand in the past five years.

A. Customer demand, or consumption, is the sum of production plus the net effect of gains or losses in water storage levels. The figures listed below, in mgd, reflect peak day customer demands for 2000-2004:

2000	2001	2002	2003	2004
93.14	93.673	94.553	94.061	85.972

Q. What is United's delivery capacity in accordance with Idaho's Department of Environmental Quality for Public Drinking Water Systems and the 2003 Edition of Recommendeds Standard for Water Works (ie. Ten State Standards)?

1 A. Paragraph 3.2.1.1 in the Recommended Standards for Water Works indicates
2 the source of supply capacity shall meet the design maximum day demand
3 with the largest groundwater source out of service. Due to the size and
4 number of wells in our system it is reasonable to predict that the two largest
5 sources, one in the west and one in the east (Bethel well-3.5 mgd and
6 Pleasant Valley well-2.7 mgd respectively) could be out of service during a
7 peak period. The contiguous system nominal delivery capacity of 95.09 mgd
8 less 6.2 mgd as discussed, results in 88.89 mgd as the reliable capacity. As
9 mentioned above, the design standard under source development paragraph
10 3.2.1.1 *Source Capacity* specifically discusses this approach in approving
11 proper design.
12 Q. Is additional source of supply needed?
13 A. Yes. We have been very fortunate during the last three summers to avoid
14 source of supply breakdowns during peak periods. Peaking demands have
15 been met by draining the reservoirs dangerously low with significant
16 difficulty in refilling during off peak hours. In late July 2003 Micron allowed
17 United to pump their well (Gowen) into the system. Exhibit 9 shows how
18 low the three major reservoirs would have been without this emergency
19 backup. Thus, when compared to the system reliable capacity of 88.89 mgd
20 we are currently deficient in the range of 6.2 mgd. The Columbia Bench
21 portion of our system is especially vulnerable because water can not be
22 imported due to the high elevation. There simply are no other choices for
23 reliable base load source in this high growth part of the system.

Q. Will CWTP enable the company to meet other regulatory requirements?

A. Yes. Idaho DEQ and EPA have adapted new regulation related to the allowable arsenic limit in drinking water. The old limit was 50 parts per billion (ppb) and the new limit is 10 ppb. Systems of United's size must be in compliance by January 2006. United has elevated arsenic in five wells primarily on the east side of the system. We are faced with either abandoning or treating in some fashion. Abandoning any source in East Boise is a poor option and simply compounds the supply problem even further. DEQ has adopted a program that will allow compliance by source management and concentration averaging. In effect we can avoid additional arsenic treatment by limiting the use of these wells for a portion of the year and allow CWTP to supply the demand.

Q. Will CWTP provide benefits in addition to meeting immediate demand for water supply and arsenic treatment?

A. Yes. There are certainly benefits. There are three areas where the benefit is most obvious:

1st <u>Drought Protection</u>: Allowing the aquifer to rest and be preserved is critical. It makes sense to use the more renewable surface water when available and take advantage of upstream storage opportunities that already exist (eg. Lucky Peak and Anderson Ranch Reservoir).

2nd <u>Postpone surface water expansion used for peaking</u>: As the aquifer recovers or stabilizes it will become possible to use groundwater more for

summer peak load only and meet base load using existing surface water treatment.

3rd Potential for Aquifer Storage and Recovery (ASR): Water right conflicts will most certainly require use of ASR to meet a portion of future demand. Because water is pumped twice this option is operationally more expensive but has a seasonal benefit. The Treasure Valley and the Boise River are positioned on the west side of the state. Normal snow pack runoff exceeds the storage capacity and simply runs through the valley during March through May. From a water right perspective this "free" water could be treated and injected into the aquifer for withdrawal later in the summer. Membrane treatment is ideally suited to accomplish ASR due to its positive barrier and concern over aquifer contamination using conventional treatment methods.

Q. Please describe the initial planning phases for the CWTP.

A. In late 2000 United contracted the services of Montgomery/Carollo Engineering. The purpose of the work was to prepare a Basis of Design report for the proposed CWTP. The consulting team and United personnel met and evaluated several elements in the Basis of Design Report dated January 8, 2002. Elements considered were:

- Raw Water Quality
- Finished Water Goals
- Treatment Technology
- Alternative Screening
- Cost Analysis

➢ Process Recommendation

The final report recommended treatment process was membrane filtration with dissolved air flotation pretreatment and ultraviolet disinfection.

Q. Please describe membrane treatment technology and why it was selected over conventional treatment with granular media filtration.

A. Membrane treatment was selected after a rigorous review and discussion. Operation costs were essentially the same. Twenty-four separate decision criteria were identified. The five with the greatest weight are presented below.

1) Reliability

Membrane filtration is generally considered to be more reliable than conventional treatment, most notably in the following three areas.

Water Quality: Finished water quality for membranes is rated higher for its low turbidity and removal of micro-biological contaminants because membranes rely on a physical barrier.

Regulatory Performance: Membrane filtration has a higher reliability in meeting future water quality regulations than granular media filtration. The filtered water turbidity standard has been adjusted by EPA three times in the last decade, and at each step it becomes more difficult for granular media filters to meet the new standard. Membrane filtration is a more reliable process for meeting future water quality regulations governing turbidity and particulate removal because it acts as a physical barrier and will not permit the minute particles to pass through to the finished water.

Reliability During Unmanned Operation: One of the objectives for CWTP is unmanned operation using remote surveillance. Membrane filtration is more reliable, in terms of water quality, for remote or unmanned operation because finished water quality is independent of pretreatment or process optimization. Granular media filtration quality is dependent upon factors such as proper operation of chemical feed systems, flash mix, and flocculation, all optimized for specific water quality conditions. If the raw water quality changes or chemical feed is interrupted, the granular media finished water quality can be adversely affected. With membrane filtration these raw water quality changes do not materially affect the membrane operation while accomplishing consistent finished water quality.

2) Capital Costs

Planning level accuracy costs were developed for both the granular media and membrane filtration options. The estimated costs were prepared using the proposed design criteria and unit cost assumptions from similar projects. The estimated construction cost of the membrane filtration option ($15,740,000) was approximately 10% higher than the estimated cost of the granular option ($14,340,000). At a planning level accuracy these options were considered equivalent.

3) Operation and Maintenance Costs

Operation and maintenance (O & M) cost were estimated at an operating capacity of 6 mgd. Annual O & M for the membrane option was $663,000

compared to $666,000 for granular. Again the options were equivalent, however membranes allow for more unattended operation.

4) Modularity for Expansion

The membrane filtration option allows expansion in smaller increments than the granular media option. As an example, the Marden WTP was originally constructed with four granular media filters, each with a 2 mgd capacity. In theory, the plant could have been expanded in 2 mgd increments; however, in practice the cost of mobilizing a contractor and performing the necessary excavation and construction of a 2 mgd filter is prohibitive. Therefore, the Marden WTP was expanded by an 8 mgd capacity increment to allow economies of scale in the expansion.

By contrast, the membrane unit of production is a frame-mounted skid, which can be economically added to existing facilities to increase the production capacity in smaller increments. The proposed low-head pressurized membrane systems used for CWTP will not require excavation or significant structural concrete construction for capacity additions of 1 to 2 mgd up to 10 mgd.

5) Production Flexibility

The membrane filtration option has more flexibility in production capacity than the granular media filtration option. This is because granular media filtration capacity is limited by water quality considerations; whereas, with membrane filtration the finished water quality is independent of production capacity. Membrane filtration allows the opportunity to increase production

by increasing production costs. For example, production capacity can be increased by increasing the frequency of chemical cleaning of the membrane without adversely affecting finished water quality. Granular media filtration does not provide the same flexibility for increasing production capacity without jeopardizing finished water quality.

Q. Please describe the site selection alternatives considered by the company for the CWTP and the site finally selected.

A. The site selection process began fall of 2000 and was concluded in December of 2001. Three sites were identified and evaluated for size, location, and suitability. Sites were across Highway 21 from Surprise Valley, Highway 21 and Grand Forest, and Columbia Road. The chosen site was Columbia Road due to elevation, operational considerations, access and ability to obtain zoning.

Q. Why did United decide to use a "Design-Build" ("D-B") procurement process?

A. The primary driver behind this decision was contractor experience in this type of construction. One disadvantage we face in Idaho is that surface water treatment plant construction on a large scale is not typical. It has unique process elements.

We faced this same situation during Marden Plant construction. There are good sub contractor skills for specific trades but overall project management and leadership are lacking. This "Design-Build" method puts the experience of the contractor working directly with the design group early enough to

1 assure an adequate but not "over" designed facility. Other benefits to United
2 are:

3 - Early budget information and control
4 - Sub contractor competition and price reduction
5 - Alternative methods for the work
6 - One contract to manage
7 - Open book cost of work review
8 - Ability to use United work force for critical elements

9 Q. How was the design-build contractor selected?
10 A. Four teams were pre-qualified and asked to submit proposals as stipulated in
11 the Request for Proposal (RFP) dated April 22, 2002. The four teams were
12 Camp Dresser McKee, Black and Veach, Montgomery Watson Harza and
13 Carollo Engineering. The RFP provided background along with the Basis of
14 Design Report previously discussed. Teams were required to provide
15 proposals which included:

16 - Qualifications
17 - Project Team
18 - Project Approach
19 - Price (Both fee and overall target cost)

20 All teams were responsive and submitted good quality information with
21 valuable ideas for improvement. Proposals were evaluated by United
22 considering both non-price and price criteria. Ultimately the team Camp
23 Dresser McKee (CDM) was chosen July 31, 2002 to begin negotiations for

1 execution of the contract. CDM is a large worldwide company with over
2 $600 million in annual billings and 3700 professionals working 110 offices.
3 CDM is ranked among the nation's 20 largest design teams and 400th largest
4 general contractor according to Engineering News Record, 2002. Several
5 items were resolved over the next two weeks including fee, overheads, sub
6 contractor administration, risk sharing, value engineering ideas, and
7 schedule. A final CDM proposal was received June 18, 2002.
8 The contract was executed September 20, 2002 after all legal language and
9 performance bonds were in place.
10 Q. What were the initial steps in the design-build process?
11 A. The initial step to the D-B process was to initiate the design and incorporate
12 all of the good ideas that had developed throughout the RFP process. These
13 included using a steel clearwell, single building layout, reduction of raw
14 water pumping requirements at the treatment site, waste handling basin, and
15 future pre-treatment configuration. We also completed the conditional use
16 approval process through Ada County.
17 Q. What happened between the time the contract was signed and the guaranteed
18 maximum price (GMP) was provided?
19 A. As stated above, the contract was signed September 20, 2002 and the final
20 GMP was presented January 14, 2004. This was a very important period to
21 insure that the membrane filtration process was compatible with the raw
22 water characteristics. Keep in mind that membrane technology is very
23 dynamic and better design ideas or layouts are routinely coming from

vendors. These include footprint, backwash efficiencies, material types that are resistant to chlorine, loading rates, and sensitivity to metals and temperature. We also needed to be sure the design could accommodate future processes like pre-treatment and ultraviolet disinfection.

The D-B process was also very new to approving agencies including DEQ and County Building Departments. The concept behind D-B is to complete the design in increments, obtain approvals and construct while other design elements are being perfected. This separated approval process proved to be a new experience for these agencies and many workshops and submittals were required to bring along their confidence that all codes were in compliance. As previously mentioned, water treatment using membranes is new to Idaho at this scale. These factors all needed to be resolved in order to reduce risk and contingencies that are a part of any complex project. During this period CDM did an excellent job getting competitive sub contract packages out to major trades including structural, mechanical, electrical, instrumentation and civil. Sub contractors knew that CDM could self perform the work with their own forces and if they wanted to work on this project their bids must be economical. This is especially important in a small market where sub contractors certainly communicate with each other. When United received the GMP there was excellent documentation of which sub contractors where chosen, where CDM had administration and overhead planned, what the contingencies were and the fee (which was unchanged from the original proposal in May 2002).

1 Q. Did CDM provide a guaranteed maximum price for the CWTP, and what was
2 it?
3 A. Yes, the GMP was $16,844,498.
4 Q. When did physical construction of the plant commence?
5 A. Initial site grading, temporary utilities, and gravel construction staging areas
6 began in October 2002. In anticipation of spring rain and mud condition,
7 CDM was issued incremental work authorizations for specific tasks once the
8 cost and scope of each was identified. Rock excavation for the 24 inch
9 transmission main in Columbia Road was also commenced. The balance of
10 this main was completed through the winter and spring 2003.
11 Q. Have portions of the initial construction helped United meet its supply
12 requirements during the construction phase?
13 A. Yes. In 2003 the final phases of Columbia Village and Surprise Valley
14 subdivisions were nearing completion. This phase of Columbia Village, at
15 the east end of the service area, is also at the highest elevation in the
16 development. Water was previously supplied from one feed at Grand Forest
17 and traveled across the entire development. During peak periods friction and
18 elevation losses resulted in pressure falling below DEQ requirements at these
19 homes. One of the reasons the CWTP was sited at this location is because of
20 its elevation and ability to provide pressure stabilization by gravity at the east
21 end of Columbia Village. We were able to obtain permits and approvals to
22 advance the schedule of the clearwell and associated 16-inch distribution
23 main, adding a second feed into this area. This work was completed in May

1 2004 before peak season. Customers experienced adequate pressure, better
2 service, and United received no complaints. Exhibit 10 demonstrates the
3 pressure stabilization result of this tank and associated 2nd feed.
4 Q. Is CWTP currently in service at the time this testimony is being prepared?
5 A. No. The construction is approximately 85% complete and is expected to be
6 partially operational in March, 2005. Full operation is expected no later than
7 June 1, 2005.
8 Q. What was the final cost of the project and how does that compare to the
9 Guaranteed Maximum Price?
10 A. The final cost of the CDM portion of the project is not yet concluded. A full
11 and detailed accounting will be accomplished at time of completion. The
12 GMP appears to be adequate due to many favorable factors related to sub
13 contractor performance, early pump procurement before steel price increases
14 this Spring, early completion etc.
15 Q. What is the construction cost of the treatment complex portion of the project
16 as expressed in dollars per million gallon assuming the GMP is the final
17 price?
18 A. $2.15/gal.
19 Q. Do you believe the design-build process and other efforts undertaken by
20 United have produced the lowest realistic price for the project?
21 A. Yes. CDM has done an excellent job of project management and cost
22 control. Sub contractors have been competitively bid. CDM has used their
23 buying power influence to get favorable prices on steel and electrical

1 hardware. The construction schedule has been enhanced and they have only
2 had one full time Superintendent on-site to keep overhead costs down. All
3 these elements have lead to the lowest realistic price for the project.
4 Q. Have you also compared the cost of CWTP in $/gallon with other similar
5 membrane plants?
6 A. Yes. I have reviewed the comparable cost data provided by CDM from
7 available information at other locations. I assisted them in developing
8 comparisons to make the information as relevant as possible. No two
9 projects are ever the same. Please refer to Exhibit 11. Costs per gallon range
10 from $.73/gal to $2.23/gal adjusted to 2005.
11 Q. Do you believe the cost of the Marden Water Treatment Plant, expressed in
12 dollars per gallon provides an appropriate benchmark for cost comparison
13 purposes?
14 A. Not necessarily. Marden WTP is an excellent conventional plant and
15 produces high quality water. The initial construction costs for Marden were
16 very economical. The concern is that the Marden costs are artificially low.
17 The General Contractor for Marden (Alder Const.) was significantly below
18 the other bidders. They, however, decided to go forward with the
19 construction rather than forfeit their bid bond. As a result, they were required
20 to self perform and in effect lived on-site in order to complete the project and
21 minimize their costs. This is not a typical situation under normal
22 construction. I was told by their president at the end of the job that it was a
23 financial disaster for them and well below their cost margins. The better

1 question is to compare what conventional plants cost today. I have provided
2 Exhibit 12 showing other conventional plants constructed since 1999 adjusted
3 to 2005 costs for comparison. This data was provided by CDM from
4 available information at other locations. I assisted them in developing these
5 comparisons. Costs range from $1.44/gal to $3.47/gal. Marden indexed to
6 2005 is $2.03/gal.
7 Q. In addition to the capital cost of the CWTP, have you identified additional
8 operational costs?
9 A. Yes. The primary additional operation costs associated with the CWTP are
10 identified below in four major categories:

➢	Purchased Raw Water	$ 78,000
➢	Power	$284,400
➢	Chemicals	$ 57,145
➢	Miscellaneous	$ 45,580
	Total	$465,125

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17 Q. Is United requesting that these additional operational costs be recognized in
18 this rate decision?
19 A. Yes. Mr. Healy has provided *pro forma* adjustments to capture these
20 additional operational costs.
21 Q. In its recent decision in the Idaho Power rate case, the Commission indicated
22 that utilities should attempt to identify expense decreasing effects of major
23 plant additions. Have you attempted to do so and what is the result of your
24 analysis?

A. Yes. Nine wells will be affected as a result of operating CWTP. Wells will either be idled or curtailed in two primary categories. One category is redundancy or backup capacity related. The other category is for water quality compliance required for upcoming arsenic regulation. The estimated power and chemical annual expense decrease is $139,580.

Q. Are there other project elements included in conjunction with the CWTP project?

A. Yes. The proforma additions included with the CWTP project are Project C04B002 – Raw Water Pump Station and Project C04B004 – 30" Raw Water Pipe Line. These two projects will go in-service at the same time as the CWTP. The Raw Water Pump Station will pump the Boise River water to the treatment plant. The 30" Raw Water Line is needed to carry the water from the pump station to the plant.

Q. Please now describe in general the other categories and purposes of the capital expenditure program planned to be placed in service between August 1, 2004 and May 31, 2005.

A. The following discussion provides information regarding projects included in the plant additions.

Project C02A008 – New Maple Hill Well #2. This project is proposed for the drilling and equipping of a new well in the First Bench Service Level with a projected capacity of 0.72 mgd. This additional capacity is needed to meet increases in peak season demands resulting from new customer growth and prevent deterioration in customer service pressures and fire protection

capacities in that area of the system. Over 2,000 new customers have been added in this service area in the past five years. This well will be located on the site of the existing Maple Hill Well #1.

Project C04A102 – Water Rights: This project is intended for the purchase of water rights, including natural flow rights, shares in canal companies and storage water. Also included are the efforts necessary to preserve and perfect existing water rights.

Project C03B003 – Maple Hill Well #1 Treatment. This project is for the design and construction of a treatment facility at the Maple Hill Well. This well has the capacity to produce 1800 gpm. However, due to water quality problems it typically runs at approximately 800 gpm. This proposed treatment facility would allow us to take advantage of the additional 1,000 gpm which is needed to meet peak season demands resulting from new customer growth and to prevent deterioration in customer service pressures and fire protection capacities.

This well has high levels of ammonia and requires large doses of chlorine to neutralize it. However, the chlorine causes the precipitation of iron and manganese, which results in customer complaints due to discolored water and staining. A pilot study has shown that break point chlorination along with a manganese greensand filter can be used to neutralize the ammonia and remove the iron and manganese.

Project C05B001 – Marden WTP Chorine Generator. This project is for the removal of the existing gas chlorination system and scrubber at the

Marden WTP, and installation of one 300 pounds per day chlorine generation unit.

Replacing hazardous chlorine gas with non-hazardous 0.8% sodium hypochlorite reduces the handling risks for employees and risks to the public in the event of a leak. This project will also eliminate the need to "harden" the chlorine room walls, doors and windows at Marden to meet the recommendations of United's EPA vulnerability assessment.

During the EPA vulnerability assessment, United's consultant encouraged the transition from the use of gaseous chlorine in ton cylinders to the use of a chlorine generator, as proposed in this project. The generator significantly reduces the potential exposure of United to the public in the event a determined and knowledgeable adversary attacks the facility.

Ten States Standards indicate a water system should maintain a minimum of 30 days of chemical supplies on site. We are not currently operating the plant in this manner in order to avoid the more stringent regulations associated with chlorine quantities greater than 1,500 lbs. A chlorine generator will enable us to achieve the 30-day supply without additional regulatory requirements.

Project C04C002 – Auxiliary Power at Pleasant Valley Well. This project is for the relocation of a 500 KW auxiliary power generator originally sited at the Marden WTP to supply the 500 HP pump at the Pleasant Valley well in the event of a power outage. Included in this project are the construction of a

suitable structure to house it, the purchase and installation of an automatic transfer switch and other electrical panels, and conduits and wiring.

The vulnerability assessment completed in March 2003 recommends that United increase its standby power generating capacity. This project will help to achieve that goal by taking advantage of the existing generator that was removed from Marden when a new 1,000 KW generator was installed in 2002.

The Pleasant Valley well is located in the Columbia Bench Service Level, at the high end of the system. Water from this facility can support much of the easterly side of the water system by gravity feed through the various pipeline interties during a major power outage.

Project C04D004 –First Bench Service Level Split – Main Improvements. This project will implement the critical distribution system improvements needed to resolve the low pressure problems experienced on the east end of the First Bench Service Level during peak summer demand periods. These improvements create a hydraulic boundary, splitting the First Bench into two pressure zones along Roosevelt Street.

The First Bench is a continuous nine-mile long pressure zone from Federal Way to Cloverdale Road. There is an approximate 150-foot drop in ground elevation from east to west, which equates to about a 65 psi water pressure difference. As pressures are increased to improve service to customers at the east end, the water, in essence, runs down-hill and overloads the service pressures to customers on the west end. Splitting this system into two

pressure zones will enable increased pressures for the east end without adversely affecting the customers in the west. It will also improve fire protection capabilities throughout the east end with the higher operating pressures.

Project C04D607 – Main Replacement on Woodlawn, Pleasanton, Ross and 29th Streets. This project is for the installation of 3,375 feet of new 8-inch and 6-inch mains in the Woodlawn and 29th Streets vicinity. The project will replace 2,970 feet of 2-inch galvanized iron pipe and 550 feet of 6-inch cast iron pipe installed between 1920 and 1950. This is part of our annual commitment to the City of Boise for improvements in fire protection capabilities as a part of our franchise agreement. It also is in conformance with our main replacement goals of focusing on the replacement of small galvanized iron pipe and aged cast iron pipe.

Project C04D108 – New Floating Feather 16-inch Main. This project is for the installation of approximately 8600 feet of 16-inch main in Floating Feather Road. United currently has an agreement with the City of Eagle to use a 12-inch city owned main to move water from the Floating Feather booster station to the West Main service level where it is needed to serve the existing customers and growth in that area. The volume of water that can be moved to the West Main service level is limited by the capacity of the 12-inch main. This project will install 16-inch main that will allow transmission of an additional 500 gpm to the West Main service level and end reliance on the city's water main.

1 **Project C04J901 – PeopleSoft 8.4 Upgrade.** This project is intended to
2 upgrade the existing financial system to the current PeopleSoft 8.4 version.
3 The current software is eight years old and is no longer supported by
4 PeopleSoft. All financial systems of United are managed through this
5 software including general ledger, asset management, construction
6 accounting and payroll.
7 **Project C04K304 – United Water Idaho Master Plan Update.** This
8 project is intended to update the existing master plan and develop a hydraulic
9 model for the distribution system. The existing plan is over 5 years old and
10 needs to be updated in order to plan, prepare and implement system
11 improvements needed to meet customer demand. Also as a part of the project
12 a computer model will be developed to enable engineering analysis and
13 decision making related to current system operation and future system
14 changes. The hydraulic model will interface with the existing GIS system in
15 order to be continually updated as completed mainline projects are digitized
16 and electronically downloaded into the database. The master plan update will
17 look at areas of growth, supply, storage etc. and outline options to be
18 considered for the next 20 year planning horizon.
19 Q. Does this conclude your testimony?
20 A. Yes it does.