
Summary of Brightwater Summer 2003 Technical Seminars

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INTRODUCTION

In response to increased growth in our region, King County is conducting a siting process for a proposed new regional wastewater treatment plant, called Brightwater. The adopted 1999 Regional Wastewater Services Plan found that our growing region needs added capacity from this new wastewater treatment system by 2010 to protect public health and the environment as well as to meet the wastewater needs for the growth projected in the service area and region.

As part on the on-going Brightwater siting process, three technical seminars were held in the Summer of 2003. Each seminar was based on a set of technical reports that presented additional analysis and scientific studies in areas of concern frequently noted in the comments received on the Brightwater Draft Environmental Impact Statement. Along with making these reports available to the public, the seminars offered people a chance to hear the new information before the final Environmental Impact Statement is issued

A month-long comment period accompanied the publication of each set of technical reports. Comments were accepted on this new information before, during and after each of the technical seminars. The technical seminars go beyond the legal requirements of the environmental impact statement process. The comments received will be considered by the Brightwater project team preparing the Final EIS. The comments are included in FEIS Volume 16.

This report summarizes the presentations and question and answers from the three seminars:

- Marine Outfall Update — June 7, 2003
- Treatment Plant and Conveyance Update — July 19, 2003
- Additional Scientific and Engineering Studies — August 16, 2003

The summaries of the seminars provided in this report are meant to capture the main points presented (with clarification as needed) and are not meant to be a verbatim record.

The seminars were advertised in the following ways:

- Paid advertisements in a number of area newspapers
- Mailing a flyer to approximately 60,000 addresses including people on the project mailing list and all addresses within 500 feet of any facility in any of the Brightwater system alternatives. (In many cases it went beyond the 500 feet minimum.)
- Press releases to the media.
- Some local jurisdictions and interest groups promoted the event.

SEMINAR FORMAT

The seminars were held on three Saturdays. Meeting attendees were asked to sign in, and were provided with a packet of information that included a blank comment form and curriculum vitae for the scheduled presenters. People were invited to make comments at the seminar using the court reporter or comment form or to submit them to King County any time within the comment periods.

Several rooms, including a display room, a presentation room, and a public comment area, were used. The display room contained informational boards and exhibits and provided a place for attendees to read information about the Brightwater project and speak with project staff on an informal, one-to-one basis. Participants watched presentations and asked questions in the presentation room. The public comment area had a court reporter ready to record comments. People were also invited to make formal comments in writing.

FIRST SEMINAR: MARINE OUTFALL UPDATE

King County staff and consultants conducted technical presentations on the marine outfall. The presentations covered geology, engineering, oceanography, dilution, biology and water quality. The presentations were organized into three sessions, with question and answer periods scheduled after each session. A 'Parking Lot' flipchart was available for capturing questions not related to the day's presentation. Parking lot issues would be provided to the staff and addressed in the upcoming seminars.

Jim Simmonds, King County project manager, provided a brief overview on the schedule and past work done on the outfall.

Marine Geology and Engineering

Kathy Thompson, of Pharos, Inc. reviewed the siting process for the Brightwater Treatment System. She reported that King County has accelerated identification of a recommended portal site for Portal 19, and is now considering the Chevron property at Point Wells.

John Newby, of CDM, addressed marine geology and engineering. His presentation began with a history of Puget Sound geology, including the glaciations that formed the region and the current sedimentation patterns. John reviewed the technologies used to study the seafloor, and laid out areas for future study.

Tom DeLaat, of Parametrix, spoke to the engineering elements of constructing the outfall. He reviewed outfall sites and technology used at other King County treatment plants, as well as regulator requirements for outfall construction and the established goals for the construction process. Tom then spoke to the challenges of placing outfall pipe in a deepwater location and listed ways in which pipe could be placed and different types of piping materials that could be used. Tom mentioned that construction methodologies are continually improving and continuing

to look at all possible construction methods and materials will ensure King County selects the best and most competitive construction technique.

Question and Answer Session

- Participants discussed their expectations for the kind of information they expected to get at the seminar and for opportunities to ask questions and discuss issues with experts.
- The group discussed how the outfall would be monitored once built.
- Participants clarified their understanding of the term “nearshore” environment.
- The outfall team clarified that one reason for identifying the Chevron property as the preferred portal site is that construction staging could occur west of the rail tracks and avoid impacts to them
- The group discussed how the diffuser would be built, and how it would avoid being covered in sediments over time. It is important to weigh down HDPE pipe as it can “float” up. This problem is avoided with steel pipe.

Oceanography and Dilution

Glenn Cannon, of the University of Washington, gave an overview of the oceanography concerns. Glenn provided information on the currents within Puget Sound and close to the outfall sites, as determined in a King County survey. Glenn listed the tools and methods used in the survey, noted locations and depths of both inflow and outflow currents, and demonstrated that both sites would be good locations for an outfall.

Bruce Nairn, of King County, then addressed how dilution of effluent occurs. Bruce reviewed the mixing process that occurs in a coastal outfall, and provided information on the timeframe and the expected dilution that King County expects to meet for the chronic and acute mixing zones around the outfall. Bruce also addressed expected effluent flow rates, current speeds and direction, seasonal influences, stratification, and other elements, and concluded that the outfall would meet or exceed all regulations designed to protect public health so there is no human health or safety risk from operation of the outfall.

Question and Answer Session

- The group discussed seasonal changes in Puget Sound and how mixing would occur in different times of the year. A deep placement for the diffuser provides the best mixing, and keeps the Sound healthy over the long term.
- The group discussed the average depth of the plume (60-140 meters deep) and the unlikely probability of it rising to the surface. One participant suggested it would be useful to have a probability curve showing the odds of a plume breaching the surface. If the plume were to

reach the surface, it would be very dilute -- 100 to 1 or higher instantaneous dilution, which easily meets water quality standards.

- Participants discussed how wastewater treatment is handled at landlocked sites elsewhere in the country and the world. Large treatment plants discharge to a body of water such as a river or ocean. Puget Sound provides an excellent place for mixing and dilution of effluents, and discharging to a river does not provide such a good level of mixing.
- The group learned that no large temperature swings are expected from the effluent. Effluent temperature is expected to be within 10 degrees of the Sound's temperature, and after dilution there will be almost no temperature shift at all.
- The group asked about the current and tidal monitoring equipment.
- The group discussed the fact that tidal effects could reintroduce previously released and mixed effluent back into the dilution zone and that this was accounted for in the modeling.
- The group clarified long-term dilution ratios including the average across all of Puget Sound and at specific locations.
- The group discussed regulatory standards for diffusion, including Department of Ecology standards and Department of Health standards. Based on the data presented, King County is confident of doing better than required standards.
- Asking about the odds of a system failure, participants learned it would require peak flows in a low stratification period and a failure of the plant's dechlorination system to occur simultaneously. This is not likely to happen, and makes the odds of a failure very low. The Department of Health regulations take this into account, and recognize that a failure is very unlikely, but they take a conservative approach in order to protect public health.
- The group clarified that the diffuser could have a longer design if future analysis showed it was necessary.
- The group considered whether some salmonids could swim through the plume and what effect that could have. King County has partnered with federal agencies looking at this issue.
- The group discussed the standards set by the Department of Ecology and the Department of Health. King County expects to easily meet those standards. One participant asked for clarification of potential health risks identified in a study published as part of the Brightwater draft EIS. The project team agreed to research this question.
- Participants asked about other outfalls in Puget Sound and learned they had been considered in the modeling done for Brightwater.

Water Quality and Biology

Kim Stark, of King County, reviewed biology survey results for the project area. The survey effort began with a review of existing literature and resources to see if enough data were available for a decision. Six studies by the project team were then conducted to fill in the gaps. Kim commented on the methods used, the species studied, and the survey results. Additional reports and more detailed information are available on request from King County. Kim closed by noting that the results of most of the surveys were satisfactory, but that once a final system is selected, the project would be following up with a more in-depth study of eelgrass density and an intertidal biota survey of the final selected site.

Jim Simmonds, of King County, then addressed water quality issues. Jim described wastewater treatment methods, and then described the new membrane bioreactor method that will be used at Brightwater. This is a newer method for treating wastewater, although it has been used in the drinking water industry. King County has tested the new method at other wastewater treatment plants. This method treats wastewater to a higher standard than conventional treatment methods.

Jim then provided modeling results for adding treated effluent to Puget Sound, looking at metals, bacteria, and organic chemicals. He noted that within Puget Sound, almost all chemicals were unchanged on any measurable scale, the exceptions being nitrogen and dissolved oxygen. Jim listed the possible effects of these exceptions, and concluded that the project still expected potential impacts to be well within state standards. Jim listed the ways in which King County plans to monitor water quality once construction is complete.

Question and Answer Session

- Participants clarified some of the numbers used to show the effectiveness of the membrane bioreactor. Some numbers were based on available literature, some of it dated. The membrane bioreactor at Brightwater would be even more effective than the older numbers.
- Participants asked about the equipment used to measure conductivity, temperature, and depth.
- They learned that the project team has recently started to look at hormones, and is participating in a national study on this issue.
- They learned that the Puget Sound environment is nitrogen-limited, so changes in phosphorus will have no effect on phytoplankton growth. They discussed the potential nitrogen increase and dissolved oxygen.
- Participants discussed the siting process and learned that water quality and biological information have been considered throughout. For the sites currently under consideration, there are no visible differences in water quality or biology. In identifying an outfall site, the team is taking into consideration the length of the crossing through the nearshore area, since this is an area with sensitive habitat. The Point Wells area has a much shorter nearshore area, which is one of the key reasons leading to its selection as the preferred alternative. The group

discussed the issues that cause the Chevron site specifically to stand out over the Richmond Beach pump station site in the Point Wells area, including eelgrass in the nearshore area and rail crossing issues.

- Participants discussed monitoring schedules. Offshore water column measurements are taken monthly. The intertidal measurements must be taken on a monthly basis to insure safe swimming. While regulations state that sedimentation should be measured every five years, King County generally measures it every other year.
- The group discussed why an intertidal biological survey is not scheduled until 2004, after the site is selected. The intertidal biological survey is only warranted for the preferred site. It will act as a baseline for the chosen site and affect mitigation, rather than acting as an element for site selection.
- Participants wondered whether some of the monitoring program that is currently voluntary could be made mandatory.
- Participants asked how biological and water quality impacts would be considered in developing mitigation for the engineering and construction work elements for the outfall. This will be an iterative process over the next several years.
- Participants asked that the Final EIS have a list of the species affected by outfall construction techniques for the recommended alternative.
- The group discussed state laws regarding Geoduck harvesting in the footprint of the outfall trench and tunnel before construction starts.

SECOND SEMINAR: TREATMENT PLANT AND CONVEYANCE UPDATE

King County staff and consultants conducted technical presentations about the history and policies that support the Brightwater facility, technology innovations, odor control, the conveyance system, tunnel construction, and plant layout and design for both the Unocal and the Route 9 sites. The presentations were organized into six sessions, with question and answer periods scheduled after each session. This report summarizes the answers given to questions during each discussion period.

Regional Wastewater Services Plan Policy Overview

Christie True (King County) began the day with an overview of the existing wastewater system and the drivers for building a new treatment facility. Key drivers include the need to provide wastewater capacity for population growth and economic development, meeting state and federal regulations, and meeting the terms of contracts and agreements. Christie also presented an overview of the Regional Wastewater Services Plan (RWSP).

Question and Answer Session

- Regarding reclaimed water production, initially Brightwater will produce up to 5 mgd of reclaimed water for on-site processes and irrigation. As demand increases, more reclaimed water could be produced for off-site customers.
- It was noted that population growth is a key driver for Brightwater. Last year there were 13,000 new residential hook-ups, which was much higher than the anticipated 7-8,000 new hook-ups.
- Regarding costs and cost containment, under the RWSP financing system, in large part, growth pays for growth. New customers throughout King County's wastewater service area will pay a capacity charge to pay for new facilities needed to serve growth.
- People on septic systems who live outside the Urban Growth Area (UGA) will not be required to hook up to the regional wastewater treatment system. Within the UGA, the decision of where and when to build or extend service lines rests with the local wastewater districts and agencies, not King County, though the county does have an obligation to provide service to these districts.
- Participants asked if alternative technologies and systems have been considered. In developing the RWSP, a number of alternatives were looked at, including alternative technologies and the building of smaller plants. It was determined that building a third regional plant was the best option. A membrane bioreactor (MBR) system—an innovative technology for treating wastewater—has been selected for Brightwater.

Wastewater Treatment Technology

Steve Krugel (of Brown and Caldwell) gave a presentation on the technology innovations planned for the Brightwater treatment plant. He spoke about treatment criteria and flows, process flow, liquid treatment technologies, effluent reuse, solids treatment technologies, digester gas use/energy recovery and beneficial uses of biosolids. He also discussed membrane bioreactors (MBR), the wastewater treatment technology that has been selected for Brightwater.

ballasted flocculation

Question and Answer Session

- It was noted that King County is confident in the MBR technology, however, because it is a relatively new technology it is prudent to reserve space should it be necessary to convert to a conventional secondary treatment process.
- The group learned that an advanced primary treatment known as ballasted sedimentation will be used to treat peak flows in the system. The advanced primary effluent will be combined with the high quality MBR effluent to meet discharge standards for secondary treatment.

- The area served by Brightwater is a separated system; there will be no combined flows (wastewater and stormwater) treated at Brightwater.
- The group discussed the disinfection process proposed for the Route 9 site. Sodium hypochlorite, which is a stronger form of household bleach, would be used for disinfection.
- A participant asked about the possibility of the influent pump station being at Portal 41. The current proposal is to have the influent pump station at the plant. If it were to be built at Portal 41, it will be designed to handle pressure in the system.
- The group discussed the emerging issue of residual estrogen in the wastewater. There is little research available at this time on this issue, and King County is participating with other agencies to study it.

Plant Layout and Design – Two Concurrent Sessions

Two concurrent sessions were held on the plant layout and design for both the Route 9 and the Unocal Site.

Route 9 Plant Layout and Design

Mary Margaret Jones (of Hargreaves Associates) presented design guidelines and the conceptual plans for the Route 9 site. She talked about site characteristics including environmentally sensitive areas. She discussed how the topography at the site, in addition to water features and vegetation, would be used as much as possible to screen the plant and minimize impacts on views in the area. Mary Margaret also asked seminar participants to fill out a questionnaire designed to gather information about priorities for design and features at the site.

Question and Answer Session

- One participant encouraged the Brightwater team to maintain a dialogue with the Audubon Society about birds on-site at Route 9.
- The Route 9 site plans already take WSDOT plans to expand Route 9 into account, including the vegetative buffers, wetlands and stormwater treatment facilities as shown in the current design.
- The north portion of the site will include trails, benches, and other public uses. Areas on the northern portion of the site will be used for regulatory mitigation such as wetland creation. Any future expansion of the plant facilities will occur at the south end of the site, not at the north end.
- Regarding plant security, a security system will be built into the plant. Topographic and water features are being used along with standard security features so security will not be obvious or unattractive. After selection of a plant site the county will work with local

emergency response agencies to meet their requirements, both during construction and operation.

- King County will work with the City of Woodinville and other local jurisdictions to ensure that design plans are coordinated with their planning guidelines and long-range plans.
- In response to questions about grading on the Route 9 site, cut and fill will be minimized as much as possible during the construction, with the goal of using as much of the material on site as possible.
- Landscaping and topography will be used to screen the plant. A variety of trees will be planted. Some of them will be fast-growing in order to provide screening early on. Reclaimed water will be used for irrigation.

Unocal Plant Layout and Design

Sian Roberts, Miller Hull Architects, and Jim Goetz, CH2M Hill, presented the proposed design and layout for the Unocal site. Jim's presentation focused on site characteristics, plant impacts to the local environment, site grading and construction phasing, landscaping plans, visual impacts, and the construction of retaining walls on the site. Sian Roberts discussed three design options, based on the different treatment capacities at the plant. The Unocal presentation also included an overview of the lid design that would have to be built if the site were to be used as an multi-modal transportation hub. Sian also asked participants to fill out a questionnaire designed to gather information about priorities for design features at the site.

Question and Answer Session

- In response to a question on view impacts, the plant at Unocal has been designed to minimize impacts on views.
- It was noted that the 72 mgd sub-alternative would only be built if the cities of Lynnwood and Edmonds choose to have their wastewater treated at the Brightwater facility. Currently both cities operate their own wastewater treatment plants.
- The group discussed potential impacts to Willow Creek. If secondary clarifiers are needed, they would be located close to Willow Creek. In the 72 mgd sub-alternative, there is the potential that a portion of the creek would be relocated; however, the county would work to maintain or improve its function.
- A question was asked regarding a small wetland shown on the site plan. This is a small area of groundwater discharge on the site. A buffer, or wetland, area would be designed around it. Wetland mitigation would be required if this area were displaced.
- What is the cost for the structural lid? The current estimated cost for a structural lid at the Unocal site (as described in the Draft EIS) is \$239 million. New construction and mitigation estimates will be published along with the FEIS.

- What would happen to the proposed condominium project at the Unocal site if it is selected for Brightwater? King County is aware that permitting is underway for a condominium development at the south end of the Unocal property. This development would not be built in this location if the Unocal site is selected for Brightwater. Therefore the combined impacts of Brightwater and this condo development have not been evaluated.
- It was noted that stormwater from the structural lid would be channeled off, collected and treated through the stormwater system at the plant site.
- The group learned that the preferred landscaping trees would be either natives or species that are known to grow well in our area.
- The group discussed the possibility of an educational or interpretive building at the Unocal site. If it were built, it is more likely that it would be off-site because the plant site is so constrained.
- There were questions about the challenges of building Brightwater at the Unocal site, including the design and function of the dewatering system during construction, what would be necessary to make certain that water levels in the nearby marsh are not significantly affected, and the pilings that would be needed because of liquefaction in the area.

Air Quality and Odor Control at the Plant Sites

Jay Witherspoon (of CH2MHill) presented information on odor control and air quality at the two proposed Brightwater sites. Jay discussed King County's commitment that Brightwater will have no odors at the property line 24 hours per day, 365 days per year. Jay talked about the compounds that create odors, and the process for scrubbing them from the air. He also discussed the tools that will be used to measure air quality emissions and prevention.

Question and Answer Session

- There were a number of questions about controlling odors during power outages and during maintenance. The treatment plant will have multiple power sources and about 20% of the electricity for the plant will be generated on-site, so odor control facilities may still be operating during power outages. There will be multiple odor control units to handle these situations. All operations will be enclosed to prevent odors from escaping.
- Regarding biosolids handling, the trucks are fully enclosed in buildings during loading. Doors are only opened after the trucks are loaded and covered so no odors escape. If an accident were to occur King County would respond according to a well-established contingency plan and clean up the area quickly.
- Regarding handling of chemicals used at the plant, there will be a site safety plan in place and the county will meet all safety measures required by local permits.

- There were questions related to development of the odor control system. The county's odor control modeling has been based on "worst case" conditions that include times of highest odor generation combined with times of little air movement. The Brightwater odor control system will be designed so that it is not depending on winds to disperse odors. The modeling also takes into account a range of processes and odor compounds that could be emitted.
- In response to questions about a possible odor control reserve fund, King County is evaluating the cost of establishing additional odor controls. The county will set up an advisory committee that could make recommendations for action if established odor control goals are not met.
- The participants learned that digester gas will be used to generate power at the plant. Enclosed flares with high burn efficiencies will be used for any gas not otherwise used at the plant.
- The group discussed King County's newly adopted odor control policy for all new wastewater facilities which states that new facilities can not release odor more than fifty times per year. For Brightwater, the county is proposing to go beyond this, preventing odors from leaving the property 365 days per year.

Conveyance System Update

Edith Hadler (of HDR Engineering) presented an update of the Brightwater conveyance system. Edith began the presentation with an overview of the project refinements put in place since the Draft EIS, including extended tunnel drive lengths, fewer portals and maximizing the use of the public right-of-way. She then discussed the permanent conveyance facilities, including their size and appearance, the locations of portals and tunnels, odor control, and long-term maintenance. Edith concluded with a discussion of the potential impacts and mitigation associated with the conveyance system.

Question and Answer Session

- More details about the Route 9 conveyance system odor control were provided. Sodium hypochlorite, a strong version of household bleach, would be added in the influent line (before untreated wastewater reaches the plant) to prevent odors. This is the same compound that would be used at the plant for disinfection.
- There were a number of questions about property appraisal, acquisition and relocation for properties needed for the project. King County must follow federal laws covering property acquisition and relocation. In some cases assistance can be provided for relocating residences, businesses or tenants. Detailed information on this acquisition process is available from the county.

- In response to questions about the tunnel alignment and structures at Portal 19, the county is currently refining the conveyance alignment for the preferred alternative; it appears that the tunnel will come into the southern tip of the Chevron facility and will not run through the City of Woodway. There are two underground facilities proposed for this portal: a sampling facility and transition structure.
- There were questions concerning the impact of the pipeline when it has to cross streams and if the drilling will occur under parks and schools. The conveyance system will cross under several creeks, but the tunnel will be deep enough that it will not affect water quality in those creeks. Wherever, possible, the conveyance system will follow public rights-of-way (streets) and avoid private property. The county has extensive data on the geology and groundwater throughout the study area and is designing the tunnel depths to avoid any significant impacts to groundwater resources.
- There were questions about conveyance system odor control. King County is committing to the same odor control standards in the conveyance system as at the plant site. The county will use the best possible technology to achieve this.
- There were questions about stormwater entering the conveyance system and what storage would be needed to handle this. In general, stormwater will not be conveyed in the Brightwater system. However, some stormwater and groundwater can enter the system through leaks found mainly in local sewer systems. This can cause high flows during storms. The influent tunnel is designed to provide storage capacity for high flows. The effluent line discharges to Puget Sound and is not designed to provide storage.
- Regarding earthquakes, the Brightwater conveyance system does not cross any known earthquake faults.
- In response to a question about the Richmond Beach treatment plant, it has been turned into a pump station. The wastewater that used to flow there now goes to the Edmonds plant.

Building the Brightwater Tunnels

Dan Adams (of Jacobs Associates) presented information on the construction of portals and tunnels for the Brightwater project. Dan began the presentation with a brief overview of tunnel segments and a definition of terms. He then discussed use of the tunnel boring machine (TBM) and the three stages of portal construction – initial support/ground improvement, excavation/depressurization, and placement of invert slab and lining. He also discussed the major steps of tunnel construction including excavation, initial lining, soils removal, and annulus grouting. He also discussed when secondary lining was appropriate. Throughout the presentation he commented on the groundwater control technology that will be applied both in portal and tunnel construction.

Question and Answer Session

- A tunnel boring machine (TBM) will move approximately 250 feet per week.
- Approximately 6 trucks per day will be needed to remove spoils during slurry wall excavation. Up to 20 trucks per day will remove spoils during the portal excavation.
- Details were provided about how the TBM slurry mix is kept from entering surrounding groundwater at the face of the boring machine. When the TBM goes through clay or impervious soil hydrostatic pressure keeps the slurry in place. In more pervious areas (sand and gravel), the slurry goes through mild compression, fills the voids in the surrounding earth and becomes self-sealing.
- Regarding repairs to the TBM, digging equipment bolted to the front of the machine can be accessed from behind the front of the machine. In stable ground conditions, the cutter head can be retracted slightly so it can be accessed for repairs. In pervious material, compressed air is used to stabilize the earth at the front of the machine so it can be accessed for repairs.
- There were questions about the portal site, including size and working in storm conditions. Working portals are about two acres and receiving portals are a bit less than one acre. The actual footprint of the portals will typically be about 50 feet in diameter for working portals and 25 feet in diameter for receiving portals. Regarding working in heavy rains, stormwater runoff has been calculated for typical portal sites and working conditions.
- How do you guide the TBM? A laser is set up at the launch site. As the TBM advances, a laser beam and computer keep the TBM on track. The laser is moved and reset as the machine advance. The position is also checked manually.
- The group discussed secondary portals. These have been identified, but are not expected to be used for construction of the conveyance system. However, if future analysis shows that one is needed, activity at a secondary portal would be much less than at a primary portal. It is unlikely there would be any permanent structures except for manholes.
- After construction, when and how will tunnel inspections be done? It is expected that inspections will be done in 10 or 30 year intervals, most likely using remote operated vehicles. If necessary, the tunnel could be de-watered for manual inspection.

THIRD SEMINAR: SCIENTIFIC AND ENGINEERING STUDIES

King County staff and consultants conducted technical presentations on the Scientific and Engineering studies that have been conducted for the Brightwater facility, including geologic and hydrologic studies, construction techniques and options, groundwater and stream flow monitoring studies, soil analyses, and site design/layout studies, for both proposed plant locations and the sites and facilities along the conveyance corridor. The presentations were organized into five sessions, with question and answer periods scheduled after each session. The

questions and answers provided in this report are meant to capture the main points presented (with clarification as needed) and are not meant to be a verbatim record.

Overview of what it will take to design and build Brightwater

Don Davis (of URS) provided a summary of the project process and schedule for the next eight years. He covered the design and construction phases and explained the project delivery process including design services, procurement, construction, testing and operation. He reviewed the project design, including engineering and architectural services, design and safety standards, codes, ordinances and permitting, and value engineering. Don explained the contractor procurement method of General Contractor/Construction Manager (GCCM), and covered construction elements, alternatives, and impacts at the two proposed sites, along the conveyance corridor, and at the outfall location.

Question and Answer Session

- The group learned more details of the bidding and contracting processes the county is considering and about cost estimates for different conveyance alternatives.
- There was discussion about the selection and use of membrane bioreactor (MBR) technology.
- There were questions about the influent pump station options for Route 9. The county clarified that an influent pump station at the treatment plant site is being considered in the FEIS, but the county is also looking at an alternative for a pump station at Portal 41.
- More details about the permitting timeline were provided. The county is working with permitting agencies and jurisdictions to facilitate the permitting process.
- Details were provided about how Brightwater and the regional system would operate during a power outage.

Geology and Groundwater Analysis

Doug Hillman (of Aspect Consulting) provided an overview of regional groundwater and geology conditions, and the work that has been completed to address comments made on the DEIS. He reviewed conveyance explorations, soil boring results, and the upcoming work for the geo-technical design phase of the conveyance corridor facilities. Doug also reviewed the history of regional geology and clarified the terminology used in the scientific studies. He provided an overview of the area's hydrogeologic conditions, mapped water supply districts, aquifer protection areas, and groundwater balances.

Joan Stoupa (of CH2M Hill) followed up with an overview of the proposed treatment plant layouts based on groundwater research that has been conducted since the Draft EIS. She

highlighted where facilities will be located for both least impact and the best surface and groundwater management. She reviewed soil removal needs, excavation depth, and structural elevations. Joan also provided the results of on-site borings.

Question and Answer Session

- Regarding the geotechnical information that is being collected, an additional 109 geotechnical test borings have been completed since the DEIS was issued, providing geotechnical information for the Final EIS. Analysis will continue through design and construction.
- There was discussion about well head and water supply protection. The county noted that it has been working with water districts to protect wells and aquifers. It is carefully studying groundwater and aquifers throughout the region in the FEIS. More specific work analyzing shallower wells along Little Bear Creek will continue.
- The county clarified that it will be building only one treatment plant, which will serve the region through 2040. Only one of the two sites now being looked at will be used.

Groundwater Control and Protection

Larry West (of SLR) talked about groundwater issues at Unocal and Route 9 sites, and explained the dewatering needs and mechanisms that would be required at each site during construction. He outlined potential impacts to aquifers, under-drains required once the plant is in operation, anticipated dewatering flows, and potential draw-down impacts to surrounding wells. He also explained aquifer protection during construction and operation.

John Newby (of CDM) presented the dewatering needs for the conveyance system. He discussed the options to minimize impacts, system needs, inflows at portals and tunnels, and expected dewatering impacts to groundwater quality and levels as well as to stream flows.

Question and Answer Session

- There were a number of questions related to dewatering and potable water supply. King County does not anticipate any significant impacts on groundwater, water supply, or future drinking water wells. King County will provide potable water if necessary. No one will be without water as a result of this project.
- More details were provided regarding tunnel construction and reliability. The tunnel liners are designed and constructed to withstand earthquake impacts. The design life of the tunnels and liner is 100 years. Seepage into the pipes is expected to be insignificant.
- Presenters described the seals that would be built to keep large quantities of groundwater from entering the construction areas.

- There were questions about the affects of dewatering and draw-downs at the Route 9 site on wetlands and Little Bear Creek. Any groundwater pumped at the Route 9 site would be put back into Little Bear Creek and could also be used to augment wetlands. As a result no adverse impacts to creek flow from dewatering are expected.
- It was clarified that groundwater encountered during construction will be continually monitored and treated.
- It was clarified that the Intercity aquifer is mentioned in the technical reports. It's referred to as a QVA Aquifer which denotes the geologic makeup of the aquifer.

Streams and Wetlands

Pete Sturtevant (of CH2M Hill) reviewed impacts to streams, wetlands and surface water from the proposed treatment plant sites. He talked about potential impacts from construction and stormwater runoff, stream relocation, and approaches to reduce, mitigate, and treat stormwater. He explained water quality and source control, and best management practices including water diversion, erosion and sedimentation plans, and discharge monitoring. He also explained efforts to reduce turbidity and contamination, and he reviewed dewatering options.

Edith Hadler (HDR) presented information about stormwater management along the conveyance corridor and at the portal sites. Edith also covered groundwater control for the tunnels and other conveyance facilities, potential discharge options, impacts to surface water, and mitigation options for these potential impacts.

Question and Answer Session

- There was discussion about how the project could affect stormwater and groundwater flows to Little Bear Creek. The presenters noted that hydrologic modeling has shown that the proposed stream diversions around the project site would have minimal flow impact. The additional stormwater detention and treatment provided by the project would reduce peak stormwater flows to the creek.
- Details were provided on how runoff will be handled during construction. Stream diversions will be installed to address direct surface runoff. Erosion control systems will be in place before any construction activities begin. Runoff will be handled by erosion control fences, sediment ponds and other practices.
- There were a number of questions concerning potential impacts of tunnel construction on groundwater and surface water flows. The portals and tunnels will be constructed so there is intimate contact with the soil, so that there is no water running down the sides or laterally along the tunnel.

Traffic Impacts and Mitigation

Tim Bevan (of CH2M Hill) reviewed traffic impacts at the proposed plant sites, explaining the methodologies used and new analyses completed since the DEIS. He provided additional traffic data, including traffic impacts during plant construction and operation. Tim outlined proposed mitigation measures for intersection locations, alternative parking and truck holding facilities, and development and implementation of traffic management plans in coordination with local jurisdictions. Finally, he talked about coordination between WSDOT and King County regarding the phasing of construction of Brightwater and the proposed SR 9 widening project.

Question and Answer Session

- In response to questions about Unocal truck haul routes, it was noted that trucks will follow SR 104 heading east, avoiding Admiral Way. The county will include summer and weekend ferry traffic when analyzing the three truck holding area options.
- Details of the SR 9 widening project were discussed. The project is funded and scheduled to be completed by the end of 2006. The county is meeting with the state to reduce overlap in construction schedules. Snohomish County has asked that King County not assume the completion of the Route 9 project when doing traffic analyses. Therefore, traffic calculations are based on current conditions.
- There were questions and discussion about traffic impacts and analyses for the Route 9 alternative. Regional growth figures provided by the Puget Sound Regional Council traffic forecast model have been used in the analyses. Transportation improvements proposed by Kenmore and Bothell have been included. For the Route 9 alternative, biosolids trucks would take SR 522 to I-405 south, then I-90 to eastern Washington.
- In response to using rail and barges for construction, it was noted that both of these options have their own environmental impacts and may require more storage area on-site. The county analyzed these options and determined that it is better to use truck hauling for construction.