APPENDIX B.
PUBLIC OUTREACH – MEETING SUMMARIES

September 2008

SUMMARY
Stakeholder Workshop on Collection System Alternatives
(Stakeholder Workshop #1)

March 16, 2006, 10 AM – 12 PM
1820 Jefferson Street
Port Townsend, WA 98368-0920

In response to the 1990 Growth Management Act (GMA), Jefferson County pursued the designation of an Urban Growth Area (UGA) in the Irondale/Port Hadlock area. As part of the requirements for establishing a UGA, Jefferson County is conducting a study of alternatives for developing a sewer system. There are currently no sewer facilities in the area, and existing residences and businesses are served by on-site treatment and disposal (septic) systems.

The sewer study will enable the County to identify 1) the final preferred alternative or method of collection, treatment, and disposal of wastewater, 2) the service area, 3) the phasing of implementation of sewers throughout the service area, 4) the cost for individual connections to sewer, and 5) revenue sources. The goal of the study is to produce a comprehensive sewer plan that will help the County plan for growth in the area over the next 20 years; that will satisfy RCW 36.94 concerning County's sewerage, water, and drainage system responsibilities; and that will be approved by the Department of Ecology.

Workshop Summary

A stakeholder workshop was held at the Jefferson County Courthouse on Thursday, March 16 from 10:00 am to 12:00 pm. The workshop was open to the public.

The purpose of the workshop was to:
- Present collection system alternatives
- Review advantages and drawbacks of each alternative
- Take questions and comments
- Identify preferences for a collection system

Jefferson County Commissioners, County staff, local agency staff, and several key members of the public were invited to the workshop. The County had identified local agencies whose facilities might be sewered and/or whose activities might be affected by the installation or operation of a sewer. The County also identified representatives of business and community organizations and citizens who had been active previously in the process to establish a UGA. These parties were contacted by telephone. A notice of the workshop was available on the County's website and in the Port Townsend Leader.

County Commissioner David Sullivan (District 2) and County Commissioner Pat Rodgers (District 3) attended the workshop. The consultants to the County were represented by Kevin

Dour and Jim Santroch of TetraTech/KCM and Bob Wheeler and Ellen Blair of Triangle Associates. A complete list of workshop participants is attached to this summary.

Introductions & Workshop Overview

Mr. Wheeler, workshop facilitator, opened the meeting at 10:10 am. He led introductions and explained the purpose of the workshop. He noted that the sewer study had just begun and that it was typical to start by identifying a collection system, because the collection system would help determine the appropriate treatment approach. He explained that sewer planning is a step-wise process, stressing that the project team understands that the cost component, which will be developed over the next few months, will be crucial to the community. He noted that the presentation on collection system alternatives would show general cost figures, but that detailed costs for each Equivalent Residential Unit (ERU) had not yet been developed.

Mr. Wheeler reviewed the agenda and requested that the County Commissioner have the first opportunity to ask questions or comment during the discussion portion of the workshop. He reviewed the steps that will lead to the selection of a complete sewer system, including public involvement opportunities, technical work, and the development of costs and funding options.

Mr. Wheeler explained that the project team had recently interviewed several local citizens and representatives of local agencies and community organizations to better understand what kind of public involvement was needed and what kind of information people wanted. He noted that a key theme that had been repeated in the interviews was that people did not want to participate in a lot of public process until new, substantive information, especially cost information, was available. People were interested in getting involved once the technical and financial information started to come together and they could tell how they might be impacted personally.

Mr. Wheeler said that this message led the project team to plan to hold public open houses later in the sewer study process, but he noted that the stakeholder workshops were intended as a way to get early input from the community to ensure that the resulting sewer plan would meet the community's needs.

Collection System Alternatives

Mr. Dour, consultant team project manager, presented the collection system alternatives, reviewed the advantages and drawbacks of each alternative, and identified the short-list of alternatives still under consideration. His PowerPoint presentation is attached to this summary. Key points of the presentation are summarized below.

Mr. Dour began by reviewing the purpose of sewer planning for the Irondale and Port Hadlock area. The two main reasons are 1) to plan for expected growth in the area, and 2) to support economic vitality in the area. Mr. Dour explained that the County is preparing a sewer Facility Plan, as opposed to any other type of plan, for the following reasons:

- It is required by WAC 173-240 for constructing or modifying wastewater facilities,

- It is a prescribed, methodical approach for planning sewer facilities,
- It meets federal funding requirements, and
- It involves the Department of Ecology, which must approve the plan, early in the process.

Mr. Dour used maps in the PowerPoint presentation (and posted on the wall) to show the 6-year and 20-year sewer planning boundaries that were established according to the Growth Management Act (GMA). He explained that the sewer would be constructed in phases during the 6-year and 20-year planning periods, beginning with the business core. He said that, since it seemed unreasonable to assume that the outlying areas would get built out all at once, the 20-year planning boundary had been divided into sub-planning areas for planning purposes. He noted that new developments would need to connect to the sewer.

Mr. Dour described the wastewater collection technologies that had been considered and noted the advantages and drawbacks of each one. He said the technologies had been analyzed and narrowed to a short-list. The short-list included:

1. Conventional gravity sewers
2. Pressure sewers
    a. Septic tank effluent pumping (STEP) method in which solids settle out into an on-site septic tank and liquid is conveyed using a high-pressure pump for treatment (please note: existing septic tanks, which are not designed for use under these conditions, would most likely be replaced since they often cannot be retrofitted).
    b. Grinder pump method in which solids in the raw wastewater are ground within a small pump chamber by a grinder pump so that the liquids and solids can be conveyed under pressure to a wastewater treatment plant.
3. A third collection system alternative was also proposed, a combined gravity/pressurized system, with gravity in the central, core portion of the system and pressure (STEP or grinder) in the outer reaches of the system.

Advantages and Drawbacks of Short-Listed Technologies

Advantages	**Drawbacks**
Conventional Gravity	

• Proven reliability	• Requires constant downward slope
	  ○ Deep sewers for flat terrain
	  ○ Intermediate pump stations for hilly areas

• Lowest operations & maintenance (O&M) costs	• Highest initial cost (deeper sewers)
• No need for septic tanks or pumps for individual connections	

Pressure – STEP	
• Low initial cost	• Septic tank O&M (ownership agreements
• Smaller sewers that can follow terrain	• Pump requirements (electrical connection)
Pressure - Grinder	
• Used when terrain doesn't allow gravity sewers and septic tanks aren't desired	• Pump requirements (electrical connection, O&M)

	• Pump must pass solids
	  o More difficult than passing liquid only
	  o Additional maintenance required

Mr. Dour presented qualitative comparisons of the short-listed collection system technologies.

Qualitative Comparisons of Collection System Technologies

Conventional Gravity	**Pressure (STEP or Grinder)**
Well-suited for high density housing (> 3 houses per acre)	Well-suited for low density housing (≤ 3 houses per acre)
Higher up-front cost	Lower up-front cost
Lower O&M cost and lower cost for future connections	Higher O&M cost and higher cost for future connections
More convenient: No tank or pump on private property	Less convenient: Septic tank and pump on private property • Requires dedicated space • O&M, access for pumping
Greater flexibility: if install gravity in commercial core, later can install either gravity or pressure sewer in outer areas	Less flexibility: if install pressure sewer in commercial core, later must install pressure sewer in outer areas
Higher total cost over 20-year planning period	Lower total cost over 20-year planning period
System tends to last longer, up to 50 years	Systems tend to last for less time; some major system components would likely be replaced after 20 years
Higher percentage of total cost would be eligible for grant funding. Gravity has higher up-front capital costs, which are often eligible for grants.	Lower percentage of total cost would be eligible for grant funding. Pressure involves costs for septic tanks and pumps on private property, which are generally not eligible for grants.

Mr. Dour concluded by presenting planning level estimates for the implementation costs, both by total cost and by cost per ERU, for a gravity sewer collection system, a pressure sewer collection system, and a combined sewer system. The costs were broken down by sub-planning area.

Questions & Comments

Workshop participants commented and asked questions during the presentation and during the discussion period at the end of the workshop. Their comments and questions, as well as the project team's responses, are grouped by topic.

Conventional Gravity Sewer Details

Question: What is the actual slope for a gravity sewer?
Response (Dour): The slope depends on the diameter of pipe, but a typical minimum slope for an 8 inch sewer is 0.004 feet per foot. When larger pipes are used, the slope can be a little less, but there is a substantial drop if the pipeline is very long. Of course, it is rare to have a natural downward slope for the whole course of the sewer.

Question: Generally, what is the topography of the service area?
Response (Dour): Coming south through Irondale, it goes from a high point to a low point with a change of about 30 or 40 feet. But way at the north end there are low points, although we probably wouldn't develop a sewer right by Chimacum Creek, where there is a 100 foot drop.

Pressure Sewer Details

Question: I assume at high densities, where it looks like a gravity sewer makes more sense than a pressure sewer, in part because of the number of septic tanks or grinder pumps that would be required, that you would explore catching the wastewater for multiple homes in one tank or pump.
Response (Dour): Yes, perhaps.

Question: Maximizing the use of available land is an important part of expanding. Compared to current septic systems, could more land be used with a pressure system that has a septic tank or a grinder pump? What would be the impact on a commercial parking lot?
Response (Dour): If there is a septic tank in place now, the new septic tank or the grinder pump could be placed in the same space. The drainage field would no longer need to be protected, so that land could be used. Also, a parking lot could go over top of an extra strong septic tank (designed for vehicle loading) or grinder pump system (if installed in a vault).

Pressure Sewer, Grinder Details

Question: Would each home have to have its own grinder pump system? Is the grinder pump a new technology?
Response (Dour): Grinder systems are not particularly new. There would be no solids in a tank on the property, but, yes, each home would have a grinder pump and electrical connection.

Question: Would existing septic tanks have to be replaced with a grinder pump?
Response (Dour): Yes, existing septic tanks would be replaced.

Question: What happens if the power goes out?
Response (Dour): Usually you would get a high level alarm, which underscores the differing levels of convenience among the sewer technologies. You would have to call the responsible agency to come and fix the problem, and you'd have to minimize your water usage in the interim. And nine times out of ten, it seems these problems happen late at night.
Response (Santroch): There is some storage capacity in the grinder and STEP systems. More storage capacity could be built in, but that would be more expensive.

Pressure Sewer, STEP Details

Question: Could existing septic tanks be used with a STEP system? Most of them already have pumps.
Response (Dour): The presumption is that existing septic tanks would need to be replaced. STEP systems involve the use of specialized tanks with integral pump vaults and electrical connections. It would cost more to retrofit an existing septic tank to make it work according to electrical codes and design requirements than it would to replace it. Another problem with existing tanks is that most of them are not watertight. They experience groundwater infiltration, which is a problem in a pressure system. In our evaluation of collection system alternatives, we assumed that all septic tanks would need to be replaced for a pressure sewer.

Question: You use concrete tanks don't you?
Response (Dour): The tanks are concrete, but they have a specialized chamber for the pump.

Question: Assuming you have a working septic tank, could the effluent go into the sewer?
Response (Dour): Theoretically, yes. It's something that would have to be decided during final design and negotiated with the sewer agency. Experience shows that only ten percent of current septic tanks are usable. STEP tanks are higher quality tanks that are created with a monolithic pour; they are designed to be watertight so the treatment system doesn't end up treating groundwater inflow.

Question: Can multiple buildings be connected to one septic tank?
Response (Dour): For a standard, single family lot, it is normal to plan for each home to have its own tank and pump. For houses that are relatively far apart, it doesn't work to connect to the same tank. For denser development, such as apartments and multi-family housing, one large tank may be able to serve multiple residences. The main issue is to not overload the tank.

If a STEP pressure sewer were implemented, we would look in detail at how buildings would be connected. Looking at existing STEP pressure sewers, for example in Yelm and Montesano, the rule of thumb is that single family homes have their own tank.

Sewer System Costs & Funding

Comment: From a property owner standpoint, once the sewer system is in, the value of your home goes up significantly when you're ready to sell.

Question: Are your cost projections just for collection or do they include treatment also? Would there be a cost savings for treatment when using a STEP system?
Response (Dour): The cost projections are for collection only. Whether or not there is a cost savings for treatment when using a STEP system depends on the situation. STEP involves less solids handling at the treatment plant, but there is decentralized solids handling. I can't say what the answer is in a general sense. An answer to this question will be discovered further into the study once we have developed an integrated collection, treatment, and disposal system.

Comment: Let people be aware that with a pressure system, property owners have to pay for the electricity for the pump.

Comment: As a homeowner, I think that whatever system is put in, if people find out that it will cost them several thousand dollars, they will fear that that the money has to be paid all up front. I assume the costs will actually be amortized over time.
Response (Wheeler): Correct, and we will analyze what rates would actually be over time.

Question: I assume there may be some grant money available to build a sewer system. Are there different funding levels based on the different sewer system alternatives?
Response (Wheeler): There are a number of grant sources that we'll investigate. The member of our team who will research funding options is on the Washington State Public Works Board, which is a source of low-interest loans. Each different grant source, such as the Centennial Clean Water Fund, has different criteria. However, usually grants can be applied to public portions of the sewer, but not for components on private property, such as septic tanks or grinder pumps. So in that regard, there may be some preference for a gravity sewer, which has more of its costs tied up in public portions of the sewer. However, we still have to do more investigation.

Question: Are the costs of responding to maintenance calls borne by the whole system or by the individual?
Response (Dour): The Department of Ecology says that it's all part of the system, so those costs go into the rates.

Question: You broke implementation costs down by ERU. For those of us who are businesses or agencies that use high volumes of water, are there other ways to do the breakdown so we can get a general idea of our potential costs?

Response (Dour & Santroch): It is hard to do because you would have to break down the whole design system. However, one way to look at it is to consider that an ERU is equivalent to X gallons per day of sewer, which works out to around 85-100 gallons per person per day. If you estimate how many people you're dealing with, you can estimate your costs based on the ERU costs.
Question: Can you estimate your usage by your water usage and find out if you're a big user or a little user?
Response (Dour): Yes, absolutely. You can look at your water records, based on your business meter usage, to see your current water usage and forecast future usage.
Response (Santroch): You would need to look at your winter water usage, because people use potable water in the summer for irrigation.

Sewer Study Methodology

Question: Are the six sub-planning areas that you defined for the sewer study topographical or political?
Response (Dour): There is nothing political about the sub-planning areas. At the onset of the study, we knew we needed to work within a 20-year and a 6-year boundary. Because the service area is so large, we did not want to assume that the whole area would get built out at once. That's why we made step-wise chunks broken out by how we thought the progression of development might occur. We looked at which areas within the 20-year boundary would be closest to sewers completed in the 6-year boundary. The sub-planning areas were estimated based upon where we thought areas would connect independently to the 6-year sewers. These were planning assumptions and they are not set it stone.

Question: One of your major assumptions in planning is that everybody hooks up to the sewer. Did you know that six weeks ago the County adopted new development regulations that referred to optional sewer areas in the 20-year boundary?
Response (Dour): I had not heard that, but for planning purposes and comparing alternatives, the main thing is to use the same assumptions for all alternatives, so it would not affect our analysis.

Comment: The sewer system is being studied in stages, first the collection system, then treatment and disposal. But if you studied the system as a whole sooner, you might find some opportunities. For example, you might find that for disposal you're going to pipe reuse water back in the same ditch the collection system is in.
Response (Dour): Once the collection, treatment, and disposal components are determined, we think we may identify efficiencies in the system.
Response (Santroch): Regarding your example, code requirements prohibit putting sewer pipe in the same ditch as treated water. They have to be 10 to 12 feet apart.
Question: Isn't that requirement changing?
Response (Santroch): It actually just changed to the numbers I mentioned.

Cost Methodology

Comment: If you find the total cost, and then use the discount rate to come up with a discounted number, you'll have the absolute present value.
Response (Dour): Yes, that's what we did.

Comment: Earlier you identified that the gravity sewer system is a lot longer-lived than a pressure system. In comparing the implementation costs of the three alternatives, it appears you are assuming the same overall service life of each of the three alternatives. It bothers me in a way, that it will mislead people into thinking that these systems will last only 20 years.
Response (Dour): That is a good point. Gravity could probably last 50 years. This analysis looks at a 20 year time span for comparison purposes, because of the 20-year planning boundary and because septics and pumps have to be replaced after about 20 years.

Pressure sewers can be viewed as a "starter kit" for a sewer system: after 20 years when the area is more densely populated and there are more people to pay, the system can be replaced with a gravity sewer. It is good to be aware that gravity lasts longer, but pressure may be all that a community can afford today. Pressure will work, but people must be aware that it's a pay-as-you-go system and it is less convenient because of ongoing maintenance.

Question: If you did a 30- or 40-year timeline, would the STEP lines (implementation costs) be a lot taller?
Response (Dour): Basically yes. It still comes down to an ability to launch or not.

Environmental Considerations

Comment: I'd like to remind everyone that much effort has gone into caring for Chimacum Creek over the years. There is a lot of groundwater recharge from septic systems that seems to be somewhat indicative of a high return flow to the creek. If we are looking at a sewer system that will, in effect, take groundwater recharge away, there will be consequences for the creek.

In this vicinity, there seem to be at least two stacked aquifers. The PUD's belief from testing over time and working two wells is that very little, if any, of the recharge from septic reaches the lower aquifer, but it's highly likely, although I'm not a hydrogeologist, that some of the recharge gets to the upper aquifer. I'm not saying we should use one system over another, but it tells you that there is an ecological advantage to having septic systems here.

Response (Dour): We do have a geologist on the consultant team, and we are looking at how to dispose of treated wastewater. Disposal will probably not be an outfall into the bay, and it may be some kind of distribution system, so the sewer system may not necessarily remove the recharge to groundwater. However, our analysis of disposal options is very preliminary and our options may change.

Water Reuse

Question: Have you thought about separating gray water and wastewater? The state PUD association is working on that.
Response (Dour): It's a big topic at the Washington Association of Water and Sewer Districts. This is not something we have considered at this point in the analysis. We will take a preliminary look at this option to see if there is any viability.

Question: Does either pressure or gravity have an advantage in separating gray water and wastewater?
Response (Dour): You would have to replumb the house to separate black and gray water. For pressure, black water would go into the septic tank or grinder, so a pump vault and control panel would still be necessary. It might mean a smaller septic tank on the property, but in the grand scheme, with all of the components involved, I don't see a major cost shift.

For gravity, it could change the ability to convey solids, so it may affect the level of infrastructure needed. If you were just doing gray water recharge, and there were no cost considerations, a pressure system would be better.

Question: Is it easier to separate black water from gray water in new construction?
Response (Dour): Yes.

Comment: We need to consider that at this stage, we have the chance to do things from scratch. In 50 years, plain water will be a precious thing. If we don't plan to reuse water now, our descendants will wonder why we didn't do it right the first time, when the ecological cost of doing things over is high.

Comment: I don't think gray water is that clean to begin with: we can't guarantee what's going down the gray water system. If we're doing treatment, we might as well treat gray water, too, and then let it infiltrate.

Comment: I agree, but reclamation has to be part of the plan from the beginning.
Response (Santroch): To be honest, disposal via an outfall seems unlikely, so we will be looking at alternative methods of disposing of treated water, such as infiltration.

Implementation of Sewer Plan

Question: I have a 25-year old septic system, and many other people are similar. What is its life expectancy?
Response (Dour): It is probably in its golden years.

Question: If you live in an outlying area and your septic fails next year, what should you do?
Response (Dour): You would need to replace the septic system. But this is getting ahead of where we are, down to how a sewer system would be implemented. There are policies that would need to be in place. For example, maybe if the sewer line is adjacent to your home, you

don't need to hook up until your septic system fails. That is a possibility. Sometimes a developer pays to put in a sewer line, but you don't pay until you connect to it. There are many options.
Response (Wheeler): We are certainly taking into account the fact that some people in the area have recently put in new septics or will be doing so soon.

Comment: People should be aware that they will have to pay for pump maintenance on their property. The PUD is not going to do plumbing.
Response (Dour): We assume that the sewer agency will maintain pumps.
Comment: But a property owner could put a "no trespassing" sign up and the agency couldn't enter. Besides if a property owner isn't responsible for, say, grinder maintenance, they will be less careful about letting things like spoons go down the drain.
Response (Dour): In order for a sewer agency to do pump maintenance, it would be necessary to negotiate a maintenance agreement with property owners. In terms of being careful about letting objects down the drain, property owners are inconvenienced when the pump or grinder needs repair. But all things being equal, you're right on that point.
Response (Wheeler): Central authorities elsewhere are doing the maintenance work for pressure sewers, and the Department of Ecology would probably push for central authority here, too.
Response (Dour): That is definitely a possibility, but at this point it's not certain how maintenance would be done here.
Comment: The point is that it is doesn't operate as smoothly as advertised.

Question: If you look at your experience with what actually gets built, isn't it always a combined system?
Response (Dour): Yelm, Montesano, and perhaps others are STEP only. Olympia is a combined system, which is an interesting example. The less dense outlying area went to STEP, but the density increased faster than expected, so they put a moratorium on STEP in that area. They are at the point where they are considering how to implement a conversion of the STEP system to gravity because of the increased density.

Preferences for Collection System

Comment: As we start talking about a possible preferred collection system alternative, I know you have to create a plan, and a 20-year planning horizon makes sense at this stage. But think about a 50-year timeline: gravity would be a big upfront cost, but it could conceivably be mitigated by outside funding, and it might be more politically feasible because the costs of individual hook-ups are lower. Gravity seems like a good way to go.

Comment: I think a combined system of gravity and pressure is preferable.

Response (Wheeler): Let me mention again that if you start with a gravity sewer in the core of the service area, you can decide later whether to do pressure or gravity in the outer areas. It gives you some options.

Comment: The Olympia example demonstrates that gravity provides more flexibility than STEP. STEP is affecting Olympia's ability to grow.

Comment: I, Mike Regan, representing Irondale Community Action Neighbors, would like to say that the gravity system seems preferable by far, even without seeing the 50-year cost projection. This discussion seems to say for many reasons that gravity has more advantages. One important thing is that with gravity the cost to the individual of putting in tanks, pumps, etc. is smaller, especially since those are costs that grants won't cover.

Comment: I would like to courteously disagree that a combined system is best. It is a case of pay me now for gravity, or pay me twice for pressure, and the next time comes soon. I would also reinforce the comments about reuse or gray water reuse. I would hope a good part of the consultants' analysis is on reuse. There seems to be a growing consensus for ecology and health that we need reuse. There is a big, untapped Saudi Arabia of water in once-used water. Now may not be the best time, because the consensus may not be strong enough yet, but the consultants need to keep alert to that movement.

Comment: Since the PUD may very well operate the sewer system, we need to try to think hard about the total out-of-pocket cost each month, including power costs, considering our public. The locality doesn't have control over outside power coming in.

Action Item

Several workshop participants urged the consultant to prepare a 50-year cost estimate for the three collection system alternatives, noting that it would show that gravity was a better value in the long term. The consultant agreed to do so.

ACTION ITEM: The consultant will prepare a 50-year cost projection to compare the three collection system alternatives.

Next Steps and Wrap Up

Mr. Wheeler encouraged all of the workshop participants to sign the sign-in sheet and to indicate whether they wanted to receive periodic project updates. He noted that another stakeholder workshop would be held in about two months. In response to a request, Mr. Dour agreed to send the PowerPoint presentation to Frank Gifford, the Jefferson County Director of Public Works, who would distribute it to interested parties. Commissioner David Sullivan thanked the participants for attending, noting that their perspectives were helpful.

Mr. Wheeler adjourned the workshop at 12:10 pm.

Workshop Attendance

The stakeholder workshop was attended by County Commissioner David Sullivan (District 2) and County Commissioner Pat Rodgers (District 3). Additional attendees are listed below.

Name	Affiliation
Kyle Alm	Citizen
Mike Blair	Chimacum School District
Evan Cael	Peninsula Daily News
Larry Crockett	Port of Port Townsend
Nancy Dorgan	Appellant in *Irondale Community Action Neighbors and Nancy Dorgan v. Jefferson County*, Western Washington Growth Management Hearings Board
Craig Durgan	Citizen
John Fischbach	Jefferson County, County Administrator
Frank Gifford	Jefferson County, Public Works
Sandy Hershelman	Jefferson County Home Builders Association
Tim Hockett	Olycap
Wayne King	Jefferson County PUD #1
Mike Regan	Irondale Community Action Neighbors; Appellant in *Irondale Community Action Neighbors and Nancy Dorgan v. Jefferson County*, Western Washington Growth Management Hearings Board
Dana Roberts	Jefferson County PUD #1
Allen Sartin	Jefferson County, Central Services
Al Scalf	Jefferson County, Department of Community Development
Ray Serebrin	Jefferson County Library
Duke Shold	Shold Excavating
Jim Strong	Hadlock Building Supply
Troy Summerill	Inn at Port Hadlock
Pete Wright	Citizen

Consultant Team Staff in Attendance

TetraTech/KCM
Kevin Dour, Project Manager; Jim Santroch, Senior Project Engineer – Treatment

Triangle Associates, Inc.
Bob Wheeler, Facilitator; Ellen Blair, Public Involvement Support

SUMMARY
Stakeholder Workshop on Treatment and Discharge
(Stakeholder Workshop #2)

May 25, 2006, 1 PM – 3 PM
1820 Jefferson Street
Port Townsend, WA 98368-0920

In response to the 1990 Growth Management Act (GMA), Jefferson County pursued the designation of an Urban Growth Area (UGA) in the Irondale/Port Hadlock area. As part of the requirements for establishing a UGA, Jefferson County is conducting a study of alternatives for developing a sewer system. There are currently no sewer facilities in the area, and existing residences and businesses are served by on-site treatment and disposal (septic) systems.

The sewer study will enable the County to identify 1) the final preferred alternative or method of collection, treatment, and disposal of wastewater, 2) the service area, 3) the phasing of implementation of sewers throughout the service area, 4) the cost for individual connections to sewer, and 5) revenue sources. The goal of the study is to produce a comprehensive sewer plan that will help the County plan for growth in the area over the next 20 years; that will satisfy RCW 36.94 concerning County's sewerage, water, and drainage system responsibilities; and that will be approved by the Department of Ecology.

Workshop Summary

A stakeholder workshop was held at the Jefferson County Courthouse on Thursday, May 25 from 1:00 pm to 3:00 pm. The workshop was open to the public.

The purpose of the workshop was to:
- Present discharge and treatment alternatives
- Review advantages and drawbacks of each alternative
- Take questions and comments
- Identify preferences for a discharge system and a treatment system

Jefferson County Commissioners, County staff, local agency staff, and several community leaders were invited to the workshop. The County had identified local agencies whose facilities might be sewered and/or whose activities might be affected by the installation or operation of a sewer. The County also identified representatives of business and community organizations and citizens who had been active previously in the process to establish a UGA. These parties were contacted by mail. A notice of the workshop was available on the project website (www.porthadlocksewer.org), the County's website, and in the Port Townsend Leader.

County Commissioner David Sullivan (District 2) attended the workshop. The consultants to the County were represented by Kevin Dour, P.E. and Jim Santroch, P.E. of TetraTech/KCM and

Bob Wheeler and Ellen Blair of Triangle Associates. A complete list of workshop participants is attached to this summary.

Introductions & Workshop Overview

Mr. Wheeler, workshop facilitator, opened the meeting at 1:00 pm. He led introductions and explained the purpose of the workshop. He reviewed the workshop agenda and the steps that would lead to the selection of a complete sewer system, including public involvement opportunities, technical work, and the development of cost estimates and funding options.

Mr. Wheeler emphasized the complexity of planning a new sewer system, noting the number of components involved, such as the collection system, interceptor lines, treatment system, disposal system, and treatment and disposal of biosolids. He noted that cost was also a major factor to consider. He explained that each component affected the others, such that sewer planning was a stepwise process of matching up components that worked together.

Mr. Wheeler explained that this workshop presentation would address discharge alternatives before treatment alternatives because the method of discharge determines the level of treatment that is required. He said that, during the workshop, the project team hoped to narrow the discharge and treatment alternatives under consideration with the stakeholders help.

Mr. Wheeler reported that a project website had been created where information and announcements could be found and comments could be submitted: www.porthadlocksewer.org.

Review of Stakeholder Workshop on Collection System Alternatives

Mr. Dour, consultant team project manager, provided a brief review of the first Stakeholder Workshop on Collection System Alternatives, which took place March 16, 2006. His PowerPoint presentation is attached to this summary. Mr. Dour said that the first workshop had focused on three collection system alternatives: a gravity collection system, a pressurized STEP or grinder collection system, and a combination of the gravity and pressurized systems. He noted that the workshop participants had discussed their preferences for a collection system, but system selection was pending.

Mr. Dour provided an update on action items from the collection system workshop. Attendees had requested a calculation of the life cycle costs of the collection system alternatives over a 50-year period. Mr. Dour explained that the 50-year life cycle cost analysis had shown the following:

- Gravity has higher start-up costs
- Pressure is about 15% ($8.3 million) more expensive than gravity over 50 years
- Pressure and a combined pressure and gravity system cost about the same
- Operations and maintenance are more expensive for STEP than for gravity

Attendees had asked about the feasibility of separating gray water out before it entered the sewer system. Mr. Dour reported that key points on gray water separation included:

- Less water in the sewer system impacts system design parameters. For example, most gravity collection systems are designed for a certain amount of water to wash solids down the pipes. Removing gray water might generate a need to build steeper gravity collection pipes in order to keep solids moving, which would need to be constructed deeper and thus cost more.
- Plumbing retrofits would be required in existing homes in order to separate gray water from black water systems (water from toilets).
- Sending gray water to a wastewater treatment plant for treatment could help prevent gray water from possibly degrading groundwater supplies.
- A septic tank and drainfield would need to be maintained for gray water separation.
- Gray water separation as a means to recharge groundwater may be redundant if land-based disposal is selected for the treated plant effluent.

Discharge Alternatives

Mr. Dour presented the discharge alternatives for the Port Hadlock UGA sewer system, reviewed the advantages and drawbacks of each alternative, and identified the short-list of alternatives that were still under consideration. Key points of the presentation are summarized below.

Mr. Dour explained that there were two basic types of discharge: marine outfall and land-based application. He reiterated that the discharge method would determine the level of wastewater treatment required. He said that for a marine outfall, secondary wastewater treatment was sometimes acceptable, although regulators could require advanced (tertiary) treatment depending on the circumstances. He said advanced treatment was almost always required for land-based disposal.

Mr. Dour described the discharge alternatives that had been considered and noted the advantages and drawbacks of each one. He said the alternatives had been reviewed and narrowed to an initial short-list for further evaluation. He noted that a key consideration for land-based disposal options was the rate at which effluent could be applied, and therefore the amount of land required. He also explained that each option may require a certain amount of wastewater storage capacity as a precaution for wet weather storage, depending upon the acceptance rate of the soil. The short-list of alternatives included:

1. Marine outfall
2. Irrigation at agronomic rates
    a. Irrigation at agronomic rates entails applying a level of effluent such that the plant cover can use all of the water and metabolize all of the nutrients.
3. Groundwater recharge: slow-rate infiltration
    a. Not an agronomic rate – the ground is used as a means of disposal
    b. Effluent is applied at a rate that allows it to percolate through the soil lens before entering groundwater

   c. Effluent can be applied at the surface or subsurface. Subsurface application may be considered due to site considerations such as ponding potential, thereby minimizing potential for human contact. If effluent is applied subsurface, for example six inches underground, a higher level of treatment is required.
4. Groundwater recharge: rapid-rate infiltration
   a. Effluent disposal in leaky bottom ponds similar to stormwater ponds.
   b. Effluent is applied at a rate that allows it to percolate through the soil lens before entering groundwater
5. Constructed wetlands
   a. Plants use nitrogen as effluent moves through wetland
   b. Water used for habitat
   c. Outflow can go into rapid infiltration ponds or straight into a stream or other water body
   d. This method often used for polishing rather than treatment

Advantages and Drawbacks of Short-Listed Discharge Alternatives

Advantages	Drawbacks
Marine Outfall	
• Less storage required • Reliability during wet season • Less land required	• Creates shellfish closure zone/might impact use of public beaches • Habitat impacts to marine environment • Additional studies would be required • Regulatory requirements may become stricter over time/getting permit is uncertain • Public acceptance
Irrigation at Agronomic Rates	
• Fewest regulatory issues • Range of uses (forests, grasses, crops) • Can be implemented in or near sewer planning area	• Largest land area required • Effluent must be stored during wet months • Largest storage area required • Potential for human contact with effluent
Slow-Rate Infiltration	
• Minimizes potential for human contact with effluent • Provides groundwater recharge	• Relatively large land area required • Regulatory considerations (sub-surface spreading vs. surface spreading, aquifer protection)
Rapid Infiltration	
• Least land area required for land-based	• Regulatory considerations (aquifer

Advantages	Drawbacks
disposal • Least expensive approach • Provides groundwater recharge	protection)
Constructed Wetlands	
• Wildlife habitat/public benefit • Works in association with recharge • Provides additional treatment of treatment plant effluent	• Moderate amount of land required • Creates mosquito habitat • Regulatory considerations (wetlands, aquifer protection)

Mr. Dour reviewed a table of estimated hydraulic application rates in gallons per day per square foot (gpd/sf), land required in acres, and storage required in millions of gallons (mgal) for each land application alternative. He explained that irrigation at agronomic rates was probably not feasible in the project area because it required an estimated 230 acres for discharge and 210 mgal of storage. Mr. Dour showed the potential land-based disposal sites on a map. He observed that irrigating HJ Carroll Park would use only a fraction (about one quarter) of the expected volume of effluent, which illustrated that the irrigation alternative would have to be used in conjunction with another method of disposal.

Mr. Dour then reviewed a chart of estimated, planning level costs for each disposal alternative. The estimated costs were broken down to show cumulative cost at each phase.

Mr. Dour summed up the following technical perspectives about the discharge options:

- Marine outfall: The estimated cost of a marine outfall is relatively low, but technical and shellfish issues could make it difficult to get approved
- Irrigation: The high cost of the irrigation alternative is driven by the need for a lot of land
- Slow-rate infiltration: Cost-effective and approvable with appropriate level of treatment
- Rapid-rate infiltration: Lowest cost and most likely approvable
- Constructed wetlands: High initial costs and expensive ongoing maintenance over time

Mr. Dour explained that, from a technical perspective, the engineering team viewed slow-rate infiltration and rapid-rate infiltration as the two best discharge options to continue to explore. He noted that rapid-rate infiltration was currently the most popular discharge method in Western Washington.

Treatment Alternatives

Referring to a diagram in the PowerPoint presentation, Mr. Santroch provided a brief overview of the wastewater treatment process, including secondary and advanced treatment and classes of disinfection (Classes A, B, and C). His PowerPoint presentation is attached to this summary. He

noted that advanced treatment did not produce effluent of drinking water quality. He said that where water shortages existed, such as in California and Arizona, treatment plant effluent from advanced processes was stored for a year and then applied to groundwater before it was pulled out for consumption. He said that advanced effluent with Class A disinfection was, however, designated as public contact water and could be used on golf courses and in swimming lakes.

Mr. Santroch reiterated the point that the discharge method selected would determine the level of treatment required. He reviewed a table that correlated the discharge options that had been presented with the level of treatment that each required, either secondary or advanced. Advanced treatment was required for both of the discharge alternatives that the engineering team thought were viable, slow-rate infiltration and rapid-rate infiltration. Mr. Santroch noted that advanced treatment would likely be required by the permitting agencies for a marine outfall as well, because of shellfish issues.

Mr. Santroch described the treatment alternatives that had been considered and noted the advantages and drawbacks of each one. He said a key consideration was the ability to build the treatment system in phases, since the system would be expanded as demand grew over time. He said the alternatives had been reviewed and narrowed to an initial short-list for further evaluation. The short-list consisted of advanced treatment options and included:

1. Oxidation ditch & filter
2. Sequencing batch reactor & filter (SBR)
3. Membrane treatment (the newest technology)

Advantages and Drawbacks of Short-Listed Discharge Alternatives

Advantages	**Drawbacks**
Oxidation Ditch & Filter	
• Tried and true • Moderate cost	• More difficult to phase • High initial costs • Good, but not best, effluent quality
Sequencing Batch Reactor & Filter	
• Moderate cost • Relatively easy to phase	• Good, but not best, effluent quality
Membrane Treatment	

• Best effluent quality
  o Removes trace organic material
  o Thought to be best at removing pharmaceuticals
• Easiest to phase
	• Higher cost

Advantages	**Drawbacks**
• More regulatory certainty – regulators likely to favor this technology into the future	

He described the planning parameters that had been used to project population and wastewater flows and how they translated into treatment system size and cost. He explained that Jefferson County had provided population numbers for 2005 and population projections through 2025, which were then used to develop projections of wastewater flow. The flow projections were extended to 2030, the planning horizon for this project.

He said that the treatment plant would open in 2010 at the earliest, so "start-up" flows had been based on population projections for 2010. The start-up flow estimates assumed that all commercial properties and no residential properties would be sewered in the core planning area. For the year 2030, a low end estimate of flows assumed that all commercial properties and post-2010 residences would discharge to sewer. A high end estimate of flows for the year 2030 assumed that all commercial properties and all residences would discharge to sewer. The flow estimates also assumed certain levels of groundwater seepage, or infiltration, into the sewer pipes and that gravity sewers would be more susceptible to infiltration than pressure sewers.

Treatment Plant Phasing

Mr. Santroch pointed out that the projected start-up flows in 2010 were roughly 10% of the projected flows in 2030, meaning a smaller treatment system would be needed in 2010 than in 2030. He said the launching costs would be extremely expensive if a treatment system were built initially with capacity for 2030 flows. He explained that it would be necessary to build a smaller system first and expand it as needed. He then described the relative ease of phasing each of the treatment options:

Oxidation ditch & filter

- There is a regulatory requirement to initially build parallel systems
    - It is necessary to build a redundant ditch and filter at the start
    - Must build 2/3 of 2030 capacity at start
- Consists of specialized structures that cannot be used for other purposes
- Many small towns who start with this technology abandon it after 15 years
- Does not lend itself to phasing

Sequencing batch reactor & filter

- Can start smaller than oxidation ditch & filter, build 1/4 or even 1/8 of 2030 capacity
- System is composed of basic boxes that are always useful at a treatment plant
- Question is how small to build the initial modules so that it makes sense to add on later

Membrane treatment

- Comparable to SBR – can build 1/4 or 1/8 of 2030 capacity at start
- System is composed of basic boxes that are always useful at a treatment plant
- Question is how small to build the initial modules so that it makes sense to add on later

Cost Estimates

Mr. Santroch reviewed a chart of estimated costs for the three treatment technologies. The costs were broken down to show cumulative cost at each phase. He pointed out that the oxidation ditch and filter technology could be cost effective if much of the long-term capacity needed were built upfront. However, he said it could be difficult to launch when starting with no sewer system in place because of the high upfront costs.

The estimated costs for the membrane system were the highest. Mr. Santroch noted that since the technology was new, the industry had not settled out yet, so the actual costs could be a bit higher than shown. He explained that the membranes have to be replaced every 7-10 years and that the technology uses 50% more energy than the other options because of the energy to clean the membranes.

Technical Perspectives

Mr. Santroch reviewed a table of criteria including qualitative and cost differences used to compare the three wastewater treatment technologies. He highlighted the inherent uncertainty about whether regulators would require effluent quality studies for any of the technologies and about which technologies could win regulatory approval. He said that one challenge of sewer planning was to balance effluent quality, regulatory requirements, and costs. He said that the project team would meet with a representative of the Department of Ecology in June to learn more about the treatment technologies considered appropriate for the Port Hadlock area.

Mr. Santroch summed up the following technical perspectives about the treatment options:

- Oxidation ditch & filter: Good effluent quality but difficult to phase and high initial costs
- Sequencing batch reactor & filter: Good effluent quality and easy to phase
- Membrane treatment: Best effluent quality, easy to phase, but potentially high cost

Mr. Santroch explained that, from a technical perspective, the engineering team viewed membrane treatment as the most viable alternative based on its excellent effluent quality and ease of phasing. He said that the less costly sequencing batch reaction & filter alternative was considered potentially viable, but that the team would need to investigate whether its effluent quality was acceptable to regulators and the community. He said that the oxidation ditch & filter alternative would be very difficult to launch unless a source of funding could be found for the upfront cost.

Disinfection

Mr. Santroch briefly described the alternative methods for disinfecting wastewater effluent, a required element of the advanced treatment process. The two short-listed alternatives under consideration were:

- Liquid sodium hypochlorite (chlorine)
- Ultraviolet (UV) disinfection

Mr. Santroch said that UV disinfection was required for marine outfall disposal but not for land application. He said that the engineering team favored the less costly liquid sodium hypochlorite alternative. Additionally, a chlorine residual would be required should treatment plant effluent be used for beneficial reuse such as irrigation.

Solids Disposal

Mr. Santroch provided a brief overview of the options for solids disposal and said the topic would be addressed in more detail at the next workshop. He said that the Port Townsend Biosolids/Composting Facility seemed to be a good candidate site for disposing of solids. Other options included hauling solids to sites in Mason County, Kitsap County, or King County, or applying the solids to forestland.

Treatment Plant Siting Considerations

Mr. Santroch described the considerations that went into siting a treatment plant. These included odors, aesthetics, costs, and space for buffer zones. He said that siting was sometimes a contentious process and that the project team was carefully considering ways to minimize the impact of a treatment system to the community. He explained that odors and noise could be controlled and the facility's appearance could be integrated with the surrounding area, but that odor and aesthetic mitigation could add 20% to 100% to the cost of the treatment plant. He noted that sites closer to developed areas required more mitigation. He explained that the ultimate decision about odor and aesthetic mitigation would be determined by community preference and cost.

Questions & Comments

Workshop participants commented and asked questions during the presentation and during the discussion period at the end of the workshop. Their comments and questions, as well as the project team's responses, are grouped by topic below.

Disposal Alternatives

Question: Did you consider using the Indian Island marine outfall for disposal?

Response (Dour): We did not look closely at that option because of the extremely high cost to pump effluent to Indian Island. Also, the Indian Island outfall is permitted for a certain volume of effluent, and it might need to be re-permitted to accommodate additional flow from Port Hadlock. Alternatively, the permit might limit the amount of effluent that the Port Hadlock UGA sewer facility would be able to produce.

Question: Did you consider the impact of the Indian Island outfall on the ability to site a new marine outfall?
Response (Dour): It would be necessary to conduct many studies to determine the potential impact of the Indian Island outfall. In particular, the existing fecal coliform count in Port Townsend bay attributable to the Indian Island outfall might impact the size of the shellfish closure zone required for a new Port Hadlock outfall.

Question: Are these fecal coliform exposure levels a problem for the shellfish or for the people who consume the shellfish?
Response (Dour): My understanding is that the risk is to humans who consume shellfish. If the contaminant is removed from the environment, the shellfish will eventually metabolize the contaminants that remain in their bodies.

Question: How recently has an outfall been permitted in Puget Sound?
Response (Santroch): I'm not certain, but the regulatory community has been raising the bar for approval of small systems like this one. It was very difficult for Vashon Island to get permission to extend an existing outfall, and Island County chose not to explore a marine outfall for its new treatment plant because it considered approval extremely unlikely. However, the regulatory community has been less strict about siting new marine outfalls in south Puget Sound.

Question: If tertiary treatment were used, would a marine outfall still cause shellfish issues?
Response (Dour): Yes, although as shown on the map, the shellfish closure zone would presumably be smaller with tertiary rather than secondary treatment. Permitting could still be a challenge even with tertiary treatment.

Question: Will tertiary treatment be necessary regardless of the disposal option selected?
Response (Dour): We believe that is the case.

Comment: I would like to see further consideration of the marine outfall disposal option. It seems like a potentially viable, lower cost alternative.
Response (Dour): If there is interest, we will look into it further.
Response (Santroch): I would caution that, although a marine outfall is the traditional discharge method, the engineering team thinks it is an unlikely option for this project because of the need for a shellfish closure zone. A Department of Health official indicated to us that a marine outfall could potentially be permitted, but that with the most advanced membrane treatment plant a shellfish closure zone with a minimum radius of 900 feet would be required and that extensive studies would be required to determine the impacts.

Question: Have you looked at combinations of disposal options, such as slow-rate infiltration combined with constructed wetlands? Wetlands are of strategic importance to the EPA, so including wetlands may open up some federal funding.
Response (Dour): We have not considered that, although it might be possible. We will have our financial specialist look into that kind of funding.

Disposal – Recharge/Reuse Issues

Question: Have you looked at the direction of groundwater flow?
Response (Santroch): We will look at that more closely as we move forward.

Comment: If disposal were at the site near the elementary school and airstrip, the effluent would flow away from Chimacum Creek rather than providing recharge.
Response (Wheeler): As we understand it, discharge from that site would flow in the direction of the creek. If that site were selected, we would investigate the issue further.

Comment: Recharge is very important. We need to put as much clean water back in the ground as possible. A study by the U.S. Geological Survey showed groundwater flow from the east side of Chimacum Creek towards the bay, so I am very concerned that discharge east of the creek would not recharge the creek.
Response (Dour): We will investigate that further.

Comment: The potential disposal site near Cotton Redi-Mix is only a few feet higher than the creek and the wetlands adjacent to the creek. The selection of a disposal site will depend on the results of specific hydrogeological studies.

Question: How do areas with gravel lenses that accept water very quickly influence the level of treatment that is required? Do some areas accept water so quickly that they cannot be used for discharge?
Response (Dour): Either those areas cannot be used or the effluent must be treated to a very advanced degree.
Response (Santroch): The question of how quickly to allow effluent into the ground is important. It will be addressed at our meeting with the Department of Ecology in June. Water reuse is still relatively new in Washington. It was approved in 1997 and there have been roughly 6-10 projects in the state. The regulations are still evolving, so there is a lot of room for negotiation with regulators. We recently did a disposal study for Island County where the soil is tight, glacial till that accepts water slowly. In that instance, rapid-rate infiltration was not feasible, but slow-rate infiltration was a good option. Here in the Irondale/Port Hadlock area, rapid-rate infiltration is being considered because of the high acceptance rate of the soil, but the regulatory community will ultimately determine what is acceptable.

Question: Can you discharge membrane-treated effluent to a lake?
Response (Santroch): Discharging to a lake is possible with very advanced treatment requirements, but such an approach is unlikely due to environmental, regulatory, and cost concerns.

Question: Could the County buy a lake, like Peterson Lake at the headwaters of Chimacum Creek, and discharge to the lake to recharge the creek?
Response (Santroch): Peterson Lake is uphill and far from the sewer planning area, so the cost of the sewer system would increase. Discharging effluent would promote eutrophication of the lake, because some amount of nitrogen and phosphorous will be present. It is possible to remove all of those nutrients, but it is expensive.

Comment: For disposal siting, it may be important to take existing and potential future wells into account.

Comment: If there are levels of toxics that are not detectable, but can still be harmful, maybe its best to move discharge away from drinking water sources. Perhaps a marine outfall is a better option.
Response (Dour): Right now, the septic tanks in the area discharging out of drainfields to groundwater. The treatment technologies proposed here would remove more toxics than are removed now.
Comment: Even if more toxics are removed, the speed at which infiltration would occur is an important factor to consider.

Comment: John Cambalik at the Puget Sound Action Team has some data about the effect of septage on water quality in Port Hadlock.
Response (Dour): That kind of information could improve our ability to get funding. We will try to get it from him.

Treatment Alternatives

Question: Does membrane treatment technology produce drinking water?
Response (Santroch): The kind of membrane technology used for sewage treatment does not produce drinking water-quality effluent. Membrane technology is used in drinking water treatment, but nobody goes straight from wastewater treatment to drinking water, as far as I know.

Question: What kind of treatment removes pharmaceuticals from wastewater?
Response (Santroch): That is a cutting edge question. There are no definitive answers yet, but membrane technology is thought to do a better job of removing pharmaceuticals than other technologies. Membrane technology is very much in favor with regulatory agencies because it removes trace organic material and pathogenic bacteria.

Question: You said that the oxidation ditch & filter alternative worked well for small treatment systems. Can you quantify small?
Response (Santroch): That technology can handle an upper limit of about 5 million gallons per day (MGD).

Question: Where has phased construction of a treatment plant been done successfully? Where has a treatment plant started small and expanded to a target size?

Response (Santroch): The engineer has to design the system to be easy to expand. Existing treatment plants that can be expanded are between 10 and 15 years old, so they haven't had to expand yet. Kingston has a system that is similar to the kind proposed here. Also, in a UGA similar to the one here, Thurston County put in a single oxidation ditch and two clarifiers. The County fronted the cost for the excess capacity, which is being paid off by latecomers. In another location, two ditches and two clarifiers were installed, but the regulatory community paid for the redundant set because they were nervous about the risks of having only one treatment path. I don't know of any SBR systems that have had to expand yet.

Question: If we started with SBR, and the membrane technology became preferred over time, could we mix and match the technologies?
Response (Santroch): Yes. The deep square tanks that are used with SBR and membrane technologies are always useful in a treatment plant setting.

Question: Would it be feasible to start with a small membrane system with a cost of $5-6 million?
Response (Santroch): Yes, absolutely. It's just a matter of how large the tanks are and how many you will need in the end. The largest standard membrane tank size handles 100,000 gallons per day. Some tanks are steel, and the bigger ones are concrete. If you wanted, you could build a treatment facility over time with many small steel tanks that would need to be replaced in 20 years.

Question: Is ozone an option for disinfection?
Response (Santroch): Ozone was used around 1980, but it did not work well. The energy costs are high, and ozone is an unstable, reactive, and dangerous substance.
Response (Wheeler): Ozone disinfection is used in potable water systems and fish hatcheries. The costs and practicalities simply have not worked well with sewage treatment.

Question: Does membrane treatment control odor better?
Response (Santroch): The risk of odor is equivalent for all three technologies.

Population & Flow Rate Projections

Question: What percentage rate did the County use for its population projections?
Response (Santroch): I'm not sure exactly, but it's a couple of percent. It's the County's GMA projection figure.

Question: Why do you expect groundwater to leak into the sewer pipes?
Response (Santroch): Infiltration is a common phenomenon. Pipe joints, manhole lids, and other components leak. Pipes underneath people's houses leak.
Response (Wheeler): We have assumed some level of infiltration and inflow. Inflow can be from illegal hook-ups from roof drains, for example, or from a maintenance hole that is too low. As good as the engineering standards are these days, infiltration and inflow still happens.

Question: What happens in an area that doesn't have a stormwater system?

Response (Wheeler): Inspectors don't know what happens on private property sometimes. Some people will have stormwater problems, and they may dump in the sewer.
Response (Santroch): The good news is that current water use in the core planning area is approximately 50,000 gallons per day and we wouldn't expect to see 95,000 gallons per day because of infiltration and inflow during the first rainy season. Sewers deteriorate over time. If your system is tight, you might need a smaller treatment facility. In addition, our numbers are based on the assumption that the sewer lines are in the groundwater area. But our hydrogeologist said that the water table here is relatively low, so our flow estimates may be too conservative. There is a fair chance that the flow would not reach the high end of our estimates, but if we make that assumption, there is a risk of building the treatment plant too small. It is also uncertain how quickly this community will grow.

Question: Who is your hydrogeologist?
Response (Santroch): Arnie Sugar with HWA is on our team.

Question: Many municipalities have problems with combined sewer overflows. How will that be dealt with here?
Response (Santroch): This is not a combined system; it does not include stormwater.
Question: What about the influence of infiltration and inflow?
Response (Santroch): We have increased our estimates of treatment plant capacity by a factor of about two to account for infiltration and inflow. In a combined system, that could be a factor of four or five. This will be a sanitary system in Port Hadlock.
Response (Wheeler): Although a few people will probably put stormwater into the sewer illegally, it will not happen throughout the whole system. Usually this kind of a system does not experience combined system overflows. Over time, however, infiltration and inflow problems might develop.

Comment: The Port Hadlock UGA stormwater plan is based on a minimal need to manage stormwater because the soils absorb so well. That is not to say that problem areas don't exist or that they won't increase as impervious surface area increases.

Comment: I'm concerned about creating a surface water problem because water is being lost to the sewer pipes.
Response (Santroch): The amount of water that infiltrates is a tiny fraction; it's to about the fourth decimal place.

Question: Is there a risk of wastewater leaking out of pressurized pipes into the ground?
Response (Santroch): Yes, that is a risk. It should be noted that public pipes tend to leak much less than pipes on private property.

Next Steps and Wrap Up

Mr. Wheeler stated that the attendees seemed to prefer the two infiltration options for disposal, with some interest in a marine outfall. He said that the attendees also seemed to agree that the membrane technology was of interest for treatment, but that the sequencing batch reactor & filter

alternative should be further explored. The attendees agreed that these were their preferences. One participant said that the oxidation ditch & filter treatment alternative would be of interest if someone would front the cost.

Mr. Wheeler noted that the next stakeholder workshop that would focus on combined alternatives of wastewater collection, treatment, and disposal would be held on June 22.

The meeting was adjourned at 3:10 pm.

Workshop Attendance

The stakeholder workshop was attended by County Commissioner David Sullivan (District 2). Additional attendees are listed below.

Name	**Affiliation**
Nancy Dorgan	Citizen
Craig Durgan	Citizen
John Fischbach	Jefferson County, County Administrator
Frank Gifford	Jefferson County, Public Works
Alan Goodwin	Citizens for the UGA/Community United Methodist Church
Elaine Goodwin	Citizens for the UGA/Community United Methodist Church
Paula Mackrow	North Olympic Salmon Coalition
Jim Parker	Jefferson PUD #1
Jim Pivarnik	Port of Port Townsend
Mike Regan	Irondale Community Action Neighbors
Ray Serebrin	Jefferson County Library
Jim Strong	Hadlock Building Supply
Troy Summerill	Inn at Port Hadlock

Consultant Team Staff in Attendance

TetraTech/KCM
Kevin Dour, Project Manager; Jim Santroch, Senior Project Engineer – Treatment

Triangle Associates, Inc.
Bob Wheeler, Facilitator; Ellen Blair, Public Involvement Support

SUMMARY
Public Workshop on Alternatives Review
(Public Workshop #3)

June 22, 2006, 1 PM – 3 PM
Port Townsend Fire Station
701 Harrison Street
Port Townsend, WA 98368-6519

In response to the 1990 Growth Management Act (GMA), Jefferson County pursued the designation of an Urban Growth Area (UGA) in the Irondale/Port Hadlock area. As part of the requirements for establishing a UGA, Jefferson County is conducting a study of alternatives for developing a sewer system. There are currently no sewer facilities in the area, and existing residences and businesses are served by on-site treatment and disposal (septic) systems.

The sewer study will enable the County to identify 1) the final preferred alternative or method of collection, treatment, and disposal/reuse of wastewater, 2) the service area, 3) the phasing and implementation of sewers throughout the service area, 4) the anticipated cost for individual connections to sewer, and 5) revenue sources. The goal of the study is to produce a sewer facilities plan that will help the County plan for growth in the area over the next 20 years; that will satisfy RCW 36.94 concerning County's sewerage, water, and drainage system responsibilities; and that will be approved by the Department of Ecology.

Workshop Summary

A public workshop was held at the Port Townsend Fire Station on Thursday, June 22 from 1:00 pm to 3:00 pm. The workshop was open to the public.

The purpose of the workshop was to:
- Present combined system alternatives
- Review advantages and drawbacks of each alternative
- Present technical recommendations
- Take questions and comments
- Decide preferred alternative

Jefferson County Commissioners, County staff, local agency staff, and several community leaders and other interested parties were invited to the workshop. The County had identified local agencies whose facilities might be sewered and/or whose activities might be affected by the installation or operation of a sewer. The County also identified representatives of business and community organizations and citizens who had been active previously in the process to establish a UGA. These parties were contacted by mail. A notice of the workshop was available on the project website (www.porthadlocksewer.org), the County's website, and in the Port Townsend Leader.

County Commissioner David Sullivan (District 2) and County Commissioner Pat Rodgers (District 3) attended the workshop. The consultants to the County were represented by Kevin Dour, P.E. and Jim Santroch, P.E. of TetraTech/KCM and Bob Wheeler and Ellen Blair of Triangle Associates. A complete list of workshop participants is attached to this summary.

Introductions & Workshop Overview

Mr. Wheeler, workshop facilitator, opened the meeting at 1:10 pm. He led introductions and explained the purpose of the workshop. He reviewed the workshop agenda and the steps that would lead to selection of a complete sewer system, including public involvement opportunities, technical work, and the development of cost estimates and funding options.

Mr. Wheeler announced that project information could be found and comments could be submitted at the project website, www.porthadlocksewer.org.

Overview of Recent Developments

Mr. Dour, consultant team project manager, indicated the sewer service area boundaries on a map, including the 6-year planning area, or core area, and the 20-year planning area. His PowerPoint presentation is attached to this summary. He then reported on new developments for issues that were raised at the previous public workshop on May 25.

- **Hydrogeology – Groundwater & Creek Flows**
  Mr. Dour reviewed a question about the potential contribution of land-based effluent disposal/reuse to the recharge of Chimacum Creek. The consultant team had done a rough calculation with available data to estimate the order of magnitude of creek recharge. The team found that with the estimated number of initial sewer participants in 2010, land-based disposal/reuse might contribute 0.5% of the creek's flow on average, and up to 1% during low flows. In 2030, assuming full participating in the sewer system, land-based disposal/reuse could contribute 10% of creek flow on average, and up to 20% during the lowest flows.

- **Ecology Meeting – Marine Outfall & Project Teaming**
  As announced at the previous public workshop on May 25, the project team met with a representative of the Department of Ecology on June 13. Mr. Dour reported that the project team had learned that Department of Ecology policy stipulates that no marine outfall may be permitted if a reasonably viable alternative exists for disposal of treated effluent. Mr. Dour said that since viable land-based disposal/reuse methods existed, a marine outfall was no longer under consideration. He said the project team and the Department of Ecology representative had identified methods of coordination to ensure the most efficient and successful development of the sewer facilities plan.

- **Phasing – Initial Treatment Systems**

Mr. Dour said that in response to stakeholder interest in using small, skid-mounted starter treatment plants to minimize sewer start-up costs, further investigation had been done and it had shown that such starter treatment plants would provide adequate capacity for only two or three years. The consultant team thought it more prudent to build a permanent facility of adequate size at the outset that would be of service longer and can be expanded to accommodate future phases of sewer system development.

- **Treatment Cost – Refinements**
  Mr. Dour said that further investigation, research, and detailed cost estimating had shown that membrane bioreactor (MBR) treatment likely would be no more than 20% more costly that sequencing batch reactor & filter (SBR) treatment, in contrast to the 20 – 100% range that had been reported at the May 25 workshop.

- **Solids Disposal Costs – Contract Disposal**
  Mr. Dour reported that the Port Townsend composting facility had been posited as the most promising option for solids disposal at the May 25 workshop. He said that further investigation had shown that contract disposal with a company called Biorecycle appeared to be the most economical option, and, at least at the onset, substantially less costly than the Port Townsend composting facility option.

Development of Recommended Alternative from Technical Perspective

Mr. Dour reviewed the technical perspectives on collection and discharge that had been presented at the previous public workshop. He explained that, from a technical perspective, the consultant team now preferred the gravity collection system to the pressure collection system, at least at the outset in the core area. He said that while gravity entailed somewhat higher start-up costs, the total cost of a pressure system would be more after eight to ten years (including capital costs, on-site costs, and operations & maintenance costs). He noted that by starting with gravity, the community would have flexibility in choosing between gravity and pressure in the outlying areas.

Mr. Dour said that the consultant team now recommended rapid-rate infiltration for effluent discharge, as opposed to a marine outfall or slow-rate infiltration. He reiterated the Department of Ecology's policy restricting the approval of marine outfalls, and he noted that rapid-rate infiltration would require a smaller footprint on the land and cost less than slow-rate infiltration.

Mr. Santroch reviewed the technical perspectives on wastewater treatment that had been presented at the May 25 workshop. He said that these perspectives had remained unchanged. He said that MBR was still the recommended treatment alternative because of its superior effluent quality, but that SBR remained a viable alternative that had a lower estimated cost. Mr. Santroch explained that chemical compounds from pharmaceuticals and personal care products (PPCPs) were being detected in effluent from wastewater treatment plants, and that stories of these compounds causing water quality problems in streams, despite concentrations almost too low to detect, were on the rise. He noted that MBR was the most effective treatment technology for removing PPCPs and that the consultant team thought MBR was worth pursuing since the treated

effluent for the Irondale/Port Hadlock sewer system would eventually reach groundwater that would likely make its way to Chimacum Creek.

Mr. Santroch reviewed the technical perspectives on solids handling that had been presented at the May 25 workshop. He reiterated the point that private, contract disposal appeared to be a better, more economical alternative than hauling to the Port Townsend composting facility. He explained that hauling to another public treatment facility, such as Poulsbo, Bremerton, or Renton, would be more costly. He said forest application would also be costly as additional solids treatment would be required. Mr. Santroch showed a chart comparing the estimated, planning-level costs of each solids handling alternative. He noted that the solids handling costs constituted just a fraction of the estimated costs for treatment and other sewer system components, and thus would have less influence on the total sewer system cost.

Mr. Dour reviewed the components of the technical recommendation and the main advantages of each:

- Collection
    - Gravity Collection in core area
    - Gravity in outlying areas
    - Have flexibility to use STEP or grinder pumps in outlying areas
    - More reliable, convenient, and economical in the long term
- Treatment
    - MBR for treatment technology
    - Provides best effluent quality on a consistent basis, easily expandable
    - Appropriate odor control & aesthetics
- Effluent Disposal/Reuse
    - Rapid Rate Infiltration
    - Least costly and easy to implement, has smallest footprint
- Solids Handling
    - Contracted haul and disposal to Biorecycle Co. in South Kitsap County
    - Least costly, can change strategy as system develops

Sewer System Implementation

Mr. Dour described the planning assumptions that were made to project how the sewer system would be implemented. He showed a map with six color-coded planning subareas and explained that the core area was expected to develop first, followed by the Rhody Drive area, and subsequently the outlying residential areas. He emphasized that these were planning assumptions, which would not dictate how development actually occurred.

Mr. Dour reviewed a table that showed the estimated year that each planning subarea would be sewered, along with the assumed sewered acreage, the assumed number of sewered equivalent residential units (ERUs), and the estimated maximum monthly flow for each planning subarea. He explained that adding up the planning subareas resulted in a total maximum average daily flow estimated at about one million gallons per day (gpd) by 2030. Mr. Dour noted that the

estimated schedule might be more aggressive than actual development, but that the GMA required the sewer facilities plan to show how sewer system would be implemented over 20 years.

Mr. Dour used a graph to illustrate the rates at which the project team anticipated the local population would connect to the sewer system. This graph was developed using population forecast data provided by the Jefferson County Planning Department. The graph showed several lines representing different data in support of the team's assumptions and analysis. The graph showed a line representing the residential population forecast in the Port Hadlock area from the County planning numbers. The graph also showed a line representing an anticipated equivalent population from commercial growth in the area in relation to the residential population forecast. Finally, the graph showed a line representing the population anticipated to be connected to sewers starting in the year 2010, through 2030 (the 20-year planning horizon), and on to area buildout. The line representing the population anticipated to be connected to sewers was developed using a compound rate of growth, rather than a linear rate, which was standard for most planning efforts and was in agreement with the method used by Jefferson County Planning to forecast the residential population in the area.

Sewer System Costs

Mr. Dour presented a series of charts that showed estimated, planning level, 20-year life cycle costs for each collection alternative, treatment alternative, and disposal/reuse alternative. The estimated costs were broken down to show cumulative cost at each phase of implementation. Mr. Santroch explained that the plan was to build two treatment trains at Phase 1, 20-day storage at Phase 2, and two additional treatment trains at Phase 3. He said that with further research he expected to be able to reduce the estimated, planning level cost for wastewater treatment.

Mr. Santroch pointed out the relative magnitude of the total estimated costs, noting that the collection technology was on the order of $100 million for all phases over 20 years, treatment was on the order of $30 million for all phases over 20 years, and the disposal/reuse options were on the order of less than $5 million for all phases over 20 years. He explained that choosing different alternatives for collection or treatment would have far more impact on total system cost than choosing different disposal/reuse options.

Mr. Santroch then showed a chart that compared the total estimated, planning level, 20-year life cycle costs for the following four sewer system alternatives (all systems were assumed to use rapid infiltration disposal/reuse, sodium hypochlorite disinfection, and private contract solids handling):

- Gravity system/MBR treatment
- STEP system/MBR treatment
- Gravity system/SBR treatment
- STEP system/MBR treatment

The costs were broken down by sewer system component: collection, treatment, disinfection, effluent disposal/reuse, and solids handling. Mr. Santroch pointed out that the estimated, planning level, Phase 1 20-year life cycle cost of the least expensive alternative, STEP system/SBR treatment, was $26 million, while the estimated, planning level, Phase 1 20-year life cycle cost of the recommended and most costly alternative, gravity system/MBR treatment, was $34 million.

For the gravity collection/MBR treatment alternative, Mr. Dour used a chart to show the cumulative system-wide cost at different points over 20 years. A second chart showed the cost per ERU at different points over 20 years. Mr. Dour demonstrated that as more users were connected to the sewer system, the lower the estimated cost per ERU was. He explained that a goal for the financing plan was to make the cost per ERU for the early sewer customers equivalent to what the cost per ERU would be after 20 years when many more customers would be connected.

Sewer Facility Siting

Mr. Dour showed a map of potential sites for wastewater treatment facilities and/or effluent disposal/reuse facilities. He said that the treatment facility and the disposal/reuse facility could be sited at the same or separate locations. The five potential sites were at or near the following locations:

- Sheriff's Facility
- H.J. Carroll Park Vicinity
- Central Port Hadlock (near Mason St. and Cedar Ave.)
- Jefferson County Airport
- Chimacum High School

Mr. Dour reviewed a slide of the advantages and drawbacks of each potential location. He said that based on cost considerations, the suitability based on surrounding land uses, and mitigation requirements, the consultant team was currently focused on the Sheriff's facility as the best alternative, with the H.J. Carroll Park vicinity as a potential back-up. He said that more analysis would be done to better understand the sites' suitability for treatment and/or disposal/reuse facilities. Mr. Wheeler noted that an area near H.J. Carroll Park, not the park itself, was being considered as a treatment facility site. He said the project team was aware that wetlands in the area could potentially impact facility siting.

Questions & Comments

Workshop participants commented and asked questions during the presentation and during the discussion period at the end of the workshop. Their comments and questions, as well as the project team's responses, are grouped by topic below.

Sewer System Costs

Comment: Although a gravity collection system would cost less than pressure in the long-run, it would mean higher initial costs.

Question: Would homeowners be responsible for onsite operation and maintenance (O&M) costs associated with STEP systems?
Response (Dour): We assumed that homeowners would not be individually responsible for those costs, and we included those O&M costs in our sewer system cost estimates. My experience has been that STEP tanks are considered part of the treatment system that is maintained by the sewer authority.

Comment: While certain sewer system components may be less expensive in the long run or they may be technologically superior, we have to face what can be financed up front. That hurdle may dictate some of the components that we choose in the end.

Question: On the graph of treatment cost estimates, do you add the bars together to get the total cost, or are the bars cumulative over time?
Response (Santroch): These are cumulative, present-worth costs, not additive costs.

Collection System Considerations

Question: Don't STEP and gravity systems both require pump stations?
Response (Dour): With a STEP system, there is actually a little pump on every customer's property. With STEP, those pumps could probably generate enough pressure so that a large influent pump station would be unnecessary. That might be the case for a grinder system as well, but we would have to look at the hydraulics. With gravity, all of the wastewater flows downhill to a low point and is then pumped uphill at a pump station, so a gravity system would probably require a few larger pump stations.

Comment: It can be difficult to access private property. It would be a problem if the sewer authority were responsible for maintenance of STEP or grinder equipment on private property. Also, if property owners are not responsible for the equipment on their own property, they will be less vigilant about preventing problems. Maybe there is space in the street right of way so equipment wouldn't have to be on private property.

Wastewater Treatment Considerations

Question: Is there any difference in reliability between the MBR and SBR treatment systems? For example, does one perform better during power outages?
Response (Santroch): Both federal and state regulatory agencies have standards and guidelines to ensure reliable service. Treatment plants are required to have a back-up generator to ensure that plant operation is continuous. The treatment system for the Irondale/Port Hadlock area will be subject to other requirements as well, since the effluent will be discharged to land and therefore to groundwater. To build redundancy into the treatment system, it is necessary to

construct either a storage pond to hold untreated wastewater or an additional treatment train beyond the facility's intended capacity to be used in the event of a treatment system malfunction. Whether to use "*n* plus one" treatment trains or storage is a design judgment.

That said, past experience has shown that during treatment process disruptions, such as power outages, MBR systems may provide greater protection of effluent quality than SBR systems provide. At this point in the planning process, the consultant team has not looked in detail at potential differences in reliability. As system design moves forward, I will further investigate the factors involved in keeping the treatment system running smoothly.

Question: Have you considered using a biomembrane system? In this system, there is a biological film on the surface of the membrane, so a biological reaction and the straining action happen simultaneously.
Response (Santroch): I am not familiar with that technology, but I would be interested in talking with you about it after the workshop.

Question: Is there a significant difference in energy costs between SBR and MBR?
Response (Santroch): Vendors currently tell us that MBR has 50% higher energy costs. A few years ago they said it was 100% higher.

Question: When biosolids are shipped out, do they still have germs or are they clean?
Response (Santroch): The biosolids would be partially stabilized before they are shipped away, but they would not be dewatered or disinfected at that point. We have found that there would be a tremendous initial capital investment required to do additional dewatering and stabilization. The design team has made a strategic call that it makes financial sense to contract out the hauling and reuse of the facility's biosolids. One identified contractor, Kitsap Biorecycle, mixes the biosolids with lime to produce an "artificial soil." This soil is then applied to fields and immediately plowed under to minimize the potential for odors and pests.

Question: The location of the treatment facility has not been determined yet, but wouldn't the site affect the phasing plan?
Response (Dour): Not necessarily. Wastewater will be collected to a given point, and then the question will just be whether it has to be pumped a short distance or a long distance. I would note that it takes a lot of energy to pump water.

Question: Why did you assume that the ratio of residential to commercial development would be 60:40?
Response (Dour): That is the current breakdown in the Irondale/Port Hadlock area. We also looked at the current zoning of the sewer planning area and the water usage trends for those land uses and came up with an estimated 60:40 ratio for future growth. We also looked at Winslow, which is a UGA similar in size and character to the UGA proposed in the Irondale/Port Hadlock area, and the ratio there is 60:40.

Question: Why are you planning a single treatment plant? Why not multiple smaller treatment facilities?

Response (Santroch): There are some regulations that relate to that question. If a system handles more than 15,000 gallons per day, it is regulated by the Department of Ecology, and the Department of Ecology tends to avoid having multiple facilities. There is also some economy of scale to building a single, large facility versus several smaller facilities. A treatment facility is very expensive relative to each connection when there are only a few customers, but it gets relatively cheaper per connection when there are more customers. For example, a single treatment facility can be quadrupled in size over time for double the original price.

Comment: Some other states have started to use multiple smaller treatment facilities and it has worked well for them.
Response (Santroch): I have read about such facilities at Cape Cod, although the authority that managed them had mixed results. If the Irondale/Port Hadlock community wants to go that route, the regulatory community would probably approve it since it's the community's money. If Jefferson County is interested in multiple, smaller treatment facilities, we would certainly investigate them.

Question: Is there an advantage to building an extra treatment train instead of a storage pond, in that you can shut down one train for maintenance and use the extra train in the interim?
Response (Santroch): Yes, absolutely.

Question: The treatment facility in Bremerton smelled very bad. How would this treatment facility be different?
Response (Santroch): The Bremerton facility had a "trickling filter" through which air was blown. That is a system prone to odor problems. The technology we are recommending would not have the same level of air/water contact which causes odor. Although the treatment technologies would be different, we are using the Port Townsend wastewater treatment facility as a model for aesthetic and odor mitigation planning.

Solids Handling Considerations

Question: Are there multiple providers for contract hauling? You have to go out to bid, and there should be competitors. Also, the provider being considered now might go out of business.
Response (Santroch): Yes there are five other independent providers. Olympus Terrace Sewer District went out to bid they received five bids.

Effluent Disposal/Reuse Considerations

Question: Are there any health risks associated with rapid rate infiltration?
Response (Dour): The effluent will be disinfected prior to being discharged.

Siting Considerations

Question: Are the potential locations you're showing for treatment or discharge?
Response (Dour): The potential locations could be for treatment or discharge or both. Nothing has been decided at this point. Treatment and discharge can happen at the same site or at separate sites, it's just a matter of moving wastewater from place to place.

Question: How big a footprint is required at the treatment and/or disposal/reuse site?
Response (Santroch): If you decide to build storage, which can take up to about 8 acres, the total acreage could be about 16 acres. Without storage, the footprint would be smaller.

Comment: We have a dearth of developable land inside of the proposed urban growth area. My concern is that the "Central Site," one of the potential locations for treatment and/or disposal/reuse, is an area that needs to be available for development. Development would bring in more sewer users who would help pay for the sewer system. It would not be a good location for sewer facilities.

Comment: A good thing about the Sheriff's facility site is that the nearby ballfields provide an opportunity for water reuse. The ballfields use a lot of water. It would be important to let people know that the treated water is clean enough for reuse.

Question: Are you looking at public land for the potential site near the Sheriff's facility?
Response (Dour): That is the ideal.
Comment: There are some private properties there, too.

Comment: Kivley Well is near the Sheriff's facility. You would have to careful to not impact the well.
Response (Dour): Yes, we would look carefully at the hydrology of the area. Also, there are regulations and required setbacks to protect wells.

Question: Have buffers for wetlands been considered already for the potential sites?
Response (Santroch): Yes.

Comment: I know the focus is currently on the Sheriff's facility alternative with the H.J. Carroll Park vicinity as a potential back-up. Since it's hard to ensure that a proposed site will actually be acquired, maybe we should rank our priorities for the rest of the potential sites.

Comment: I think the Jefferson County Airport is a good alternative. There may be some advantage to working out an arrangement with the Port of Port Townsend. The Port is interested in getting sewer service and they might be willing to host the wastewater facilities in exchange.
Comment: I have experience working with the Port, and I would be very concerned about FAA and waterfowl issues at the Jefferson County Airport.
Comment: Perhaps a storage pond would not be allowed at the airport site, but the tanks could be covered.
Comment: Think carefully about whether to use the airport site, because that site could be beneficial for development in the county in the long run.

Comment: I oppose the Central Port Hadlock site, because the community has expressed interest through visioning processes in commercial and multi-family development in that area.

Comment: If either the Chimacum High School site or Jefferson County Airport site were used, there would be very strong community concern about development expanding down Rhody Drive.

Comment: At the Chimacum High School Site, there's a setback for the creek that may limit the amount of space available for a wastewater facility.

Question: Some time ago there was a discussion about the mill tying into the sewer system and sharing its treatment and marine outfall capacity. Is that still under consideration?
Response (Wheeler): The mill is between five and eight miles away and over a hill from the sewer planning area. Pumping wastewater that far and over a hill is a huge cost. It would likely be a challenge to permit additional discharge via the marine outfall, especially because the mill does not currently process wastewater so sharing facilities would introduce shellfish protection issues.

Comment: Jefferson PUD #1 is planning to conduct a groundwater study, including modeling and field observations, for the Chimacum Creek Basin. The sewer project team should contact Bill Graham to coordinate on what information is need.

Sewer System Planning

Comment: Looking at your graph of growth of residential and non-residential ERUs, I think the commercial areas would be sewered faster than you show because there is a lot of pent up demand. However, I think the residential areas would be sewered more slowly than you show, since people will not be required to connect to sewer if they have a functioning septic system. Growth in sewer system connections could be more of a step function.
Response (Dour): Yes, we have made many assumptions in estimating how the sewer system will grow. We have made certain assumptions about how quickly people will hook up to the sewer system, but it may be that one or more of the treatment system expansions create adequate capacity for longer than we show here.

Comment: I think commercial and multi-family residential development will grow faster than shown here.
Response (Dour): That is certainly possible. The way we developed the 12.4% growth curve of the number of sewered ERUs was to look at the estimated number of initial users and the estimated number of users at the end of the 20-year planning period and basically connect those two dots. We assumed a compound growth rate to get the curve you see here.

Next Steps and Wrap Up

Mr. Wheeler thanked the attendees for their input and said that it would help the consultant team to refine the recommended sewer system alternative to present at a public open house in July. Mr. Wheeler asked if, based on the regulations governing marine outfall, it was appropriate to drop marine outfall from consideration for effluent disposal and focus on rapid-rate infiltration. The attendees agreed that it was. The attendees also agreed that it was appropriate to focus on

gravity as the recommended collection technology in the core area, with a focus on gravity in the outlying areas but the possibility of using a pressure system instead

The meeting was adjourned at 3:20 pm.

Workshop Attendance

The public workshop was attended by County Commissioner David Sullivan (District 2) and County Commissioner Pat Rodgers (District 3). Additional attendees are listed below.

Name	**Affiliation**
Vanessa Brower	Citizens for the UGA
John Fischbach	Jefferson County, County Administrator
Linda Germeau	Kitsap Bank
Frank Gifford	Jefferson County, Public Works
Syd Lipton	Citizen
Jim Parker	Jefferson PUD #1
Dana Roberts	Jefferson PUD #1
Allen Sartin	Jefferson County, Central Services
Ray Serebrin	Jefferson County Library
Troy Summerill	Inn at Port Hadlock

Consultant Team Staff in Attendance

TetraTech/KCM
Kevin Dour, Project Manager; Jim Santroch, Senior Project Engineer – Treatment

Triangle Associates, Inc.
Bob Wheeler, Facilitator; Ellen Blair, Public Involvement Support

SUMMARY
Stakeholder Workshop on Cost and Financing
(Stakeholder Workshop #4)

October 10, 2006, 1 PM – 3 PM
Jefferson County Courthouse
1820 Jefferson Street
Port Townsend, WA 98368-0920

In response to the 1990 Growth Management Act (GMA), Jefferson County pursued the designation of an Urban Growth Area (UGA) in the Irondale/Port Hadlock area. As part of the requirements for establishing a UGA, Jefferson County is conducting a study of alternatives for developing a sewer system. There are currently no sewer facilities in the area, and existing residences and businesses are served by on-site treatment and disposal (septic) systems.

The sewer study will enable the County to identify 1) the final preferred alternative or method of collection, treatment, and disposal/reuse of wastewater, 2) the sewer service area, 3) the phasing and implementation of sewers throughout the service area, 4) the anticipated cost for individual connections to sewer, and 5) potential revenue and funding sources. The goal of the study is to produce a sewer facility plan that will help the County plan for growth in the area over the next 20 years; that will satisfy RCW 36.94 concerning Counties' sewerage, water, and drainage system responsibilities; and that will be approved by the Department of Ecology.

Workshop Summary

A public workshop was held at the Jefferson County Courthouse on Tuesday, October 10 from 1:00 pm to 3:00 pm. The workshop was open to the public.

The purpose of the workshop was to:
- Present developments & design refinements to the preferred sewer system alternative
- Present the cost estimate
- Provide information on financing strategies
- Take questions and comments

Jefferson County Commissioners, County staff, local agency staff, and several community leaders and other interested parties were invited to the workshop. The County had identified local agencies whose facilities might be sewered and/or whose activities might be affected by the installation or operation of a sewer. The County also identified representatives of business and community organizations and citizens who had been active previously in the process to establish a UGA. These parties were contacted by mail. A notice of the workshop was available on the project website (www.porthadlocksewer.org), the County's website, and in the Port Townsend Leader.

County Commissioner Phil Johnson (District 1), County Commissioner David Sullivan (District 2), and County Commissioner Pat Rodgers (District 3) attended the workshop. The consultants to the County were represented by Kevin Dour, P.E. and Jim Santroch, P.E. of TetraTech/KCM, Katy Isaksen of Katy Isaksen & Associates, and Bob Wheeler, P.E. and Ellen Blair of Triangle Associates. A complete list of workshop participants is attached to this summary.

Introductions & Workshop Overview

Mr. Wheeler, workshop facilitator, opened the meeting at 1:00 pm. He led introductions and explained the purpose of the workshop. He reviewed the workshop agenda and outlined the steps that would lead to the completed sewer facility plan, including public involvement opportunities, technical work, and the development of cost estimates and funding options. He distributed a handout that defined acronyms and abbreviations used in the presentation.

Mr. Wheeler announced that project information could be found and comments could be submitted at the project website, www.porthadlocksewer.org.

Mr. Wheeler thanked the participants for their on-going participation in the sewer facility plan process. He said that the valuable input the County and the consultant team had received had helped them to identify and refine the preferred sewer system alternative.

Mr. Wheeler summarized the purpose of planning a sewer system for the Port Hadlock UGA. He highlighted the following reasons:

- Responsible, proactive planning for population growth under the auspices of the Growth Management Act
- Environmental protection
    - Chimacum Creek
    - Shellfish beds
- Allows denser development in designated areas
    - Development to planned densities

To preface the cost estimate and financing strategy presentation, Mr. Wheeler said it was important to recognize that brand new sewer systems were inherently expensive. He noted that the substantial capital cost of building a whole new sewer system was incurred in the beginning when the fewest customers were participating and sharing the cost, which made it challenging to start a new system.

Mr. Wheeler explained that sewer planning to date had produced some of the "facts" about what a sewer system might cost and what financing strategies would be available. He emphasized that the critical next step after developing the "facts" would be to investigate innovative financing strategies and to apply for funding, in other words to do the "artwork." He explained that an approved sewer facility plan would make the project eligible for a variety of funding programs. He mentioned the following four types of funding assistance as examples:

- Grants
- Congressional/legislative line items

- Low interest loans
- Low income assistance

Mr. Wheeler noted that the cost estimates to be presented could change in the future as the work of detailed final design, obtaining funding, and deciding on financing strategies proceeded.

Recent Developments & Design Refinements to Preferred Alternative

Mr. Dour, consultant team project manager, briefly described the components of the preferred sewer system alternative and the reasons for their selection. The PowerPoint workshop presentation is attached to this summary. Mr. Dour reported that potential locations for the wastewater treatment plant had been narrowed to the southern portion of the UGA, in the vicinity of the Sheriff's Facility. He said that a site for the influent pump station, the station that would pump the wastewater collected from the entire system to the treatment plant, had been identified near Ness' Corner Road and Shotwell Rd. Mr. Dour displayed two maps that showed the area of the potential treatment plant locations and the approximate site of the influent pump station.

To optimize financing and development of the sewer system, Mr. Dour said that the consultant team had estimated the wastewater treatment plant costs year by year and had shifted the timing of costs further into the future whenever possible. This strategy was to attempt to lower the initial cost of the system in the earlier years when fewer participants would be connected. He said that the consultant team's hydrogeologist was continuing to work to ensure that the selected disposal method would direct the treated, Class A treatment plant effluent to a beneficial use. He said that the intent was to recharge groundwater that flowed to Chimacum Creek, thus augmenting creek flow.

System Financing & Planning Process

Mr. Dour gave an overview of the plan to phase implementation of sewer service into the UGA, with the initial service area to be centered around the Port Hadlock commercial core. He described the requirement that sewer facility plan contain identified funding sources and financing strategies.

Mr. Dour said that the County and the community would have the opportunity to decide whether or not to move forward with implementation once the sewer facility plan was approved.

Updated Capital Cost through 2018

Mr. Dour presented the updated estimate for the capital cost of sewer facilities through 2018. The facilities would serve the core commercial area and Rhody Drive during this initial phase. There would be some additional treatment facility capacity available for future residential areas. The estimate was approximately $33.5 million.

Funding Strategies

Ms. Isaksen, financial analyst, said her intent was to identify a mix of funding that would minimize the cost of the sewer system.

Ms. Isaksen explained that sewer costs were divided into two basic types, with implications as to how they are funded:

- Capital costs
    - One-time costs to build the physical facilities
    - Mix of capital funding sources typically used to pay for capital costs
- Operation and maintenance (O&M) costs
    - On-going costs to operate and maintain the facilities
    - Distributed to users by monthly sewer rates

Ms. Isaksen said that capital costs must be paid up front, with funding typically obtained from a mix of grants, loans, bond proceeds, and/or other methods. She noted that grants were the best source of funding because they did not require repayment. Later in the presentation, Ms. Isaksen detailed the ways that sewer customers could repay funding from the other sources.

Ms. Isaksen listed several types of funding opportunities and indicated whether each one was available to pay for capital costs, O&M costs, or both. She showed that many more sources of funding were available to pay for capital costs than for on-going O&M costs. She described specific examples of capital funding sources, such as Department of Ecology and USDA Rural Development grants and low-interest loans.

Considerations for Funding Initial Capital Costs through 2018

Ms. Isaksen then explained in more detail the options for funding the estimated capital cost through 2018 of a sewer system in the Port Hadlock UGA. She said that, from a financial perspective, capital costs were divided into the following two categories:

- Common/shared costs
    - Costs for facilities that benefit multiple sewer customers
    - Typically eligible for grants, loans, bonds, and other outside funding sources
- Private/on-site costs
    - Costs for the sewer line and other equipment on private property that connect the property to the sewer system
    - Typically paid by property owner

Ms. Isaksen said that common/shared costs were further broken down into General costs and Local costs. General costs are for facilities that benefit all of the sewer system's customers. For example, the wastewater treatment facility serves all of the sewer system's customers. Local costs are for facilities that benefit a subset of the sewer system's customers. For example, a sewer line through a neighborhood street serves only the customers in that neighborhood.

Common/Shared Capital Costs	
General • Wastewater treatment facility • Disinfection system • Solids handling • Disposal • Influent pump station • Oversizing collection pipelines (greater than 8" in diameter)	Local • Gravity collection pipelines up to 8" in diameter

Ms. Isaksen said that General costs were higher because they included the relatively costly wastewater treatment facility. The estimate for each component of capital cost through 2018 was as follows:

- Common/Shared Cost
  - General: $21,074,114
  - Local: $8,934,800

- Private/On-Site Cost
  - On-Site: $3,455,000

Ms. Isaksen presented a timeline (2010 to 2018) that illustrated that the majority of the common/shared costs would be incurred in 2010, with relatively smaller costs incurred in 2012, 2015, and 2018 to expand the collection and treatment systems.

Ms. Isaksen said that she had focused her analysis on how to fund the upfront costs in 2010, because new customers connecting to the sewer system could help to defray the smaller costs in 2012, 2015, and 2018.

She gave an example (see PowerPoint presentation) of a mix of funding sources that could be used for the 2010 shared/common costs. She said that while multiple funding sources were usually necessary to amass enough money, it was important to recognize the level of effort as well as the administrative and other requirements in selecting which and how many funding programs to pursue.

Strategies for Recovering Capital Costs from Users

Ms. Isaksen presented three methods for sewer customers to repay the upfront capital costs: connection charges, a Utility Local Improvement District (ULID), and assessments based upon property value.

She explained that ULIDs were defined in statute, and that to form a ULID, essentially a boundary was drawn around the properties benefiting from a project, and all of the properties

within the boundary were assessed a share of the capital costs based on the benefits they received. She pointed out that a sewer ULID assessment against a property was prohibited by law from exceeding the benefit received from the availability of sewer service, in other words the dollar value of the assessment could not exceed the increase in value to the property. She said customers were typically allowed to pay off the assessment on an annual basis over 10 to 20 years.

Ms. Isaksen said that a single ULID could be formed to encompass the entire sewer service area but that it was more likely that multiple ULIDs would be established for individual neighborhoods within the service area. These ULIDs could be established over time as the collection system developed and expanded. Ms. Isaksen said that a ULID could be formed one of two ways: either the property owners within a proposed ULID boundary would petition the responsible governing entity (county) or the County Commissioners would adopt a resolution.

Ms. Isaksen presented three scenarios which would likely be used to recover capital costs. These are summarized below.

Strategy	**Description**
Connection Charges for General and Local Costs	Customer pays a fee when connects to sewer
Connection Charges for General Costs and a ULID for Local Costs	ULID Assessment is paid off annually once sewer lines come to the neighborhood, customer pays connection charge when connects to sewer
Assessed Value for General and Local Costs	When sewer lines come to the neighborhood, property owners pay annually based on value of their property; undeveloped property pays much less than developed property

Ms. Isaksen noted that it is typical for monthly rates to be used to pay off long-term debt, but that this was not a likely option for a new sewer system because there are no existing sewer customers to pay monthly rates.

Ms. Isaksen said that some jurisdictions allowed sewer customers to pay connection charges off over time. Thus, both connection charges and/or Utility Local Improvement District (ULID) assessments are mechanisms available that may enable customers to spread their payments over time, rather than pay a single, large, lump sum. Ms. Isaksen said that if customers were permitted to spread their connection charges over time, some entity, for example the County, would need to guarantee that the debt service would be paid and may need to bridge the difference for a period of time before the customers can provide full repayment.

Ms. Isaksen noted that the assessed value method is used much less commonly than connection charges or ULIDs. Each property's assessment under this method would be based on that

property's assessed value for real estate tax purposes. Thus an undeveloped property would pay less than a developed property of the same size.

Estimates of Capital Costs per Equivalent Residential Unit (ERU)*

Ms. Isaksen presented the estimated capital cost per ERU for commercial property and for residential property. For the residential property estimate, she assumed that a grant would cover 45% of the shared/common costs. She based her assumption on the maximum grant available from the USDA Rural Development program.

Ms. Isaksen displayed two tables that illustrated how customer payments for common/shared costs could be concentrated or spread over time, depending on the financing strategy used. Using a connection charge method, the customer would pay common/shared costs as well as the private/on-site cost at the time of connection. Using a combination strategy of a connection charge plus a ULID, the customer could begin paying Local costs when the ULID comes to the neighborhood, and could pay the General and private costs at the time of sewer hook-up.

Ms. Isaksen explained that the consultant team had tried to develop realistic, but conservative, cost estimates to ensure that the actual costs would be within the estimates and to enable the County and community to make realistic plans. Ms. Isaksen said the cost estimates had been based on recent bid results on other projects and that standard estimating procedures had been used. To be conservative, a 30% contingency was included in the capital costs, which Ms. Isaksen said was customary for planning level estimates. Ms. Isaksen said she had also included a 15% financing cost and had applied a conservative interest rate when calculating the estimated debt service payments for low interest loans.

Ms. Isaksen stressed that funding agencies looked favorably on projects with realistic cost estimates. She compared the capital cost estimates for a Port Hadlock UGA sewer system to three recent sewer system expansions in Western Washington to demonstrate the Port Hadlock UGA cost estimates were comparable with actual projects.

Operations & Maintenance Cost Estimate

Ms. Isaksen presented a planning level estimate of $60/month per residence for on-going O&M costs, which included billing, administration, and state taxes. Some assistance may be available for low income customers. Commercial properties would be charged according to their water usage where one equivalent residential unit (ERU) would be equal to 4,500 gallons per month.

How to Continue to Reduce Costs

* One ERU is 4,500 gallons of wastewater produced per month for the purposes of this analysis. A business may represent multiple ERUs depending on the amount of wastewater produced. A single-family residence is typically considered one ERU, regardless of the amount of wastewater produced.

Ms. Isaksen concluded by stressing that the "art" of reducing the cost to sewer customers was only beginning. She encouraged the County and the community to prepare for approval of the sewer facility plan by exploring funding and financing options as soon as possible. She recommended approaching Congressional and legislative representatives, observing that Jefferson County had successfully obtained a federal line item to renovate the clock tower at the County Courthouse. Ms. Isaksen said that Jefferson County staff would be meeting with several funding program administrators at the IACC (Infrastructure Assistance Coordinating Council) Conference in Wenatchee at the end of October to get advice on how best to position the Port Hadlock UGA sewer project with funding agencies.

Ms. Isaksen highlighted the importance of seeking low-income assistance, such as USDA Rural Development and/or health department loans. She said that one option was to use grant funding to create a low-income assistance program.

Ms. Isaksen also encouraged the County and the community to explore opportunities for O&M cost savings during the implementation phase.

Finally, Ms. Isaksen said that maximizing the number of customers who participated in the first phase of sewer implementation would make it easier to distribute sewer system start-up costs.

Questions & Comments

Workshop participants commented and asked questions during the discussion period at the end of the workshop. Their comments and questions, as well as the project team's responses, are summarized and grouped by topic below.

Cost Estimates

Comment: Although a business might constitute more than one ERU, the total capital cost to the business may not equal the estimated capital cost per ERU multiplied by the number of ERUs. This is because the estimated capital cost per ERU includes the private, on-site cost of connecting to sewer. If a business constitutes multiple ERUs, there would still be only one hook-up on the property. While that hook-up may be more expensive than a hook-up to a residence because of the size of the equipment, it may still be less than multiplying the estimated private, on-site cost per ERU by the number of ERUs.
Response (Isaksen): That is true.

Question: Is the 30% contingency factor built into the on-site, Local, and General costs? Is that typical? Do the actual costs usually come in that high?
Response (Dour): The contingency factor is built into the on-site, Local, and General costs. This is standard planning procedure. It is good planning, in part, to include a contingency factor in the estimate capital costs because, at the current planning level, the preliminary design does not account for details which will be discovered in final design. For example, the collection system was developed using an aerial contour map with 10 foot contour intervals, which is

acceptable for planning but is a coarse scale for final design. At the planning level, we made best guesses as to where maintenance holes would be located, but perhaps in the final design phase it will turn out that there need to be 10% more maintenance holes than we have anticipated. Also, we cannot predict how prices for materials like steel, concrete, or petroleum will change by the time construction could begin.

Question: Can you tell us more about why you included a 15% financing cost in the cost estimates?
Response (Isaksen): This is a conservative estimate of the cost of financing. Say you had to borrow money during construction and you had to pay interim interest on the construction funds until the permanent financing was complete. I have assumed this may be up to 2.5% of the amount financed. If you went to the open bond market, it might be another 2.5% for the underwriter and bond counsel, along with another 10% to borrow the required reserve. However, if you are organized and well-prepared, it is typically less expensive to obtain funding through grants and low-interest loan programs.

Question: Is the 15% financing cost included in the common/shared capital cost estimates, which are about $21 million for General costs and about $9 million for Local costs?
Response (Isaksen): I tried not to mix the calculation of the estimated costs *per ERU* with the total capital cost estimates that the engineers developed. The engineers provided cost estimates that included a 30% contingency factor. None of their total capital cost estimates included the 15% financing cost. In my financing work, I added the 15% financing cost only to the estimated *cost per ERU*.

Question: Did you break the estimated capital costs down as monthly costs per ERU?
Response (Isaksen): I avoid presenting capital costs on a monthly basis because I don't want to set the County up to have to accept payments on a monthly basis. However, if you assume a capital cost of $12,850 for a residence, and that you would be paying it back over 20 years with an interest rate of 3.5 %, this would be approximately $75 per month for the capital portion. Added to the estimated $60 per month for on-going O&M and administration, it could be $135 per month.

Question: You've presented a variety of financial approaches, but are you recommending the most expensive sewer system technology?
Response (Isaksen): The preferred alternative has the highest initial capital costs among the technologies that the engineers evaluated. However, the life cycle costs of the preferred alternative are lower because on-site and operation and maintenance costs of the other technologies tend to increase the life cycle costs over time.

When the preferred alternative type of system is built, you don't have to redo it, and you get a higher level of treatment that anticipates future regulations. From a financial perspective, the average cost per ERU over 20 years is about $1,500 more than the least expensive technologies of a STEP collection system with an SBR treatment plant.

Question: Are the cost estimates per ERU based on the 20-year planning boundary or the six-year planning boundary?

Response (Isaksen): The cost estimates per ERU were based on the average of the 20-year planning area. If the estimates were calculated only up to the year 2018, the cost per ERU would be about $5,000 higher because there would be fewer connections to share in the cost of treatment plant. There are cost savings associated with bringing residential customers on to the system in the latter decade of the 20-year planning period.

Question: You assumed that solids handling would be contracted to a private hauler. Are there multiple companies doing this work: is there competition? We don't want to be stuck with one company if their prices rise.
Response (Santroch): There are multiple private haulers, and there are also public haulers like the City of Port Angeles. We based our cost estimates on one, stable private hauler. Also, if prices for hauling rise, the cost-effectiveness of investing in solids handling facilities in Port Hadlock could be revisited.

Question: Did you build expected growth into your per ERU cost estimates for the core area?
Response (Dour): Yes, we made planning level assumptions about growth. We used population forecasts from the Jefferson County Comprehensive Plan, and we used the land use map for the Irondale/Port Hadlock area, which defines densities for residential and commercial development. We checked the ratio of commercial to residential development against the ratio of commercial to residential water usage and against the ratio of development in similar communities to backcheck the ratio used in our projections.

If the sewer system is built, a comprehensive sewer plan will be developed, which must be regularly updated. The comprehensive sewer plan would contain updates to the growth projections as the area develops and the County's Comprehensive Plan changes.

Financing Strategies

Question: What political entity will pursue financing strategies, such as establishing a ULID, for the sewer system?
Response (John Fischbach, Jefferson County Administrator): It is ultimately the County's responsibility to pursue these strategies.

Question: How many years in advance of sewer availability may a ULID be established?
Response (Wheeler): That is a legal question, and we don't know for sure.

Funding Availability

Question: Why did you assume a 45% grant for residences? Would we get that grant?
Response (Isaksen): I assumed a 45% grant for residential ERUs from the USDA Rural Development, which is the maximum amount available from that program. These grants are available for hardship situations, which are defined as cases where sewer services cost more than 1.5% of monthly income. Based on the median household income of the Irondale/Port Hadlock census area, this project would clearly qualify for the maximum grant funding from the USDA Rural Development program. Grant funding is available up to a maximum of 45% of capital costs to help bring the sewer service costs down towards 1.5% of monthly income.

Please note that being qualified does not guarantee a grant or an amount; it is necessary to apply for the grant.

Question: Are there other grant sources for connection fees if the Housing Authority owns a residential property that is connected to the sewer system? Is there a waiver for such properties?
Response (Isaksen): A representative of the USDA Rural Development sewer system grants program mentioned to me other housing grants that are available from other administrators. As I understand it, there are other funding sources for low income residences. I don't know if only residents are eligible, or if non-resident property owners are eligible.

Question: Is there enough sewer grant funding in the current federal budget for all of the qualified applicants?
Response (Isaksen): There almost certainly is not. It is important to have a good application to get to the top of the list.

Preliminary Design

Question: Are there any land uses that are incompatible with being adjacent to a wastewater treatment plant? Are there innovative land uses adjacent to wastewater treatment plants?
Response (Santroch): People often oppose having a wastewater treatment plant nearby, but we are including provisions in the cost estimates to make this wastewater treatment plant a good neighbor. We are using the Port Townsend wastewater treatment facility, which is adjacent to homes, as a comparable model of how to be a good neighbor.

Question: You've talked about doing odor control and visual screening at the wastewater treatment facility. Are there noise issues as well?
Response (Santroch): Treatment plants can be noisy. However, noise control methods are typically used to limit the noise levels to 40 decibels, which is quieter than my speaking voice right now.
Response (Wheeler): An acceptable level of noise for a Port Hadlock treatment plant would be determined through the State Environmental Policy Act, but it is fairly easy to mitigate noise for the type of treatment facility being proposed. I would encourage anyone to visit the Port Townsend wastewater treatment plan for reference.

Question: You are proposing a pump station in the vicinity of the library. Would there also be one to pump wastewater up from the alcohol plant?
Response (Dour): Yes, there would be a few local pump stations. In terms of estimating the General costs, we planned for one large, influent pump station in the vicinity of the library because the overall collection system as laid out in this plan tends to drain towards this area. Smaller, local pump stations were included in the Local cost estimates.

Question: Do the trucks pick sludge up from the treatment facility or from the pump station?
Response (Dour): Sludge is picked up at the treatment facility.

Question: With contract hauling for solids handling, how many trucks would be traveling to and from the wastewater treatment facility?
Response (Santroch): In the early years, probably one truck a week. If contract disposal were continued as the sewer system expanded, you could get up to one truck per day.

Question: There have been several sewage spill accidents in the news recently. While the proposed wastewater treatment facility would be cleaner than other options, the potential sites for the facility are very close to drinking water sources. Why are you suggesting sites so close to drinking water? Is it just cheaper?
Response (Santroch): It is important to note that, by law, wastewater treatment and disposal facilities must be located a prescribed distance away from drinking water wells. One of the main drivers of the evaluation of potential disposal sites was local interest in recharging Chimacum Creek. We pursued options that would recharge the creek further upstream to be more beneficial.
Response (Wheeler): The consultant team is also studying the hydrology of the area to ensure that disposed effluent would flow towards the creek and not towards a well. That is part of our job.

Next Steps and Wrap Up

Mr. Wheeler thanked the attendees for their input. He outlined the next steps in the development of the sewer facility plan, which included a public meeting on October 25, the completion of the draft sewer facility plan by the end of 2006, a public meeting to be scheduled in February 2007, and Department of Ecology approval of the sewer facility plan in March of 2007.

The meeting was adjourned at 3:00 p.m.

Workshop Attendance

The public workshop was attended by County Commissioner Phil Johnson (District 1), County Commissioner David Sullivan (District 2) and County Commissioner Pat Rodgers (District 3). Additional attendees are listed below.

Name	**Affiliation**
Robert Bates	Citizen
Mike Blair	Chimacum School District
Bill Brock	Northwest School of Wooden Boatbuilding
Brent Butler	Jefferson County
Evan Cael	Peninsula Daily News
Phil Flynn	Citizen
Alan Goodwin	Community United Methodist Church
Elaine Goodwin	Community United Methodist Church
Laurie Gore	Citizen
Sandy Hershelman	Jefferson County Home Builders Association

Name	**Affiliation**
Sandra Hill	Citizen
Douglas Joyce	Citizen
Maureen Joyce	Citizen
Elizabeth Lammers	Citizen
Garrett Larsen	Citizen
Rebecca Lopeman	Citizen
Kimberly Macintosh	Citizen
Bill Mahler	Northwest School of Wooden Boatbuilding
Bob Matheson	Citizen
Margaret Matheson	Citizen
Kathy McKenna	Jefferson County Housing Authority
William Miller	Jefferson County Planning Commission
Jim Parker	Jefferson PUD #1
Frances Rawski	Citizens for the UGA
Dana Roberts	Jefferson PUD #1
H.C. Rogers	Citizen
Chuck Russell	Valley Tavern
Craig C. Smith	Peninsula Video
Bonnetta Starlin	Citizen

Consultant Team Staff in Attendance

TetraTech/KCM
Kevin Dour, Project Manager; Jim Santroch, Senior Project Engineer – Treatment

Katy Isaksen & Associates
Katy Isaksen, Financial Analyst

Triangle Associates, Inc.
Bob Wheeler, Facilitator; Ellen Blair, Public Involvement Support

Public Meeting, October 25, 2006

Citizens & Project Team Discuss Preliminary Design, Cost Estimate & Financing Strategies

On Wednesday, October 25, 2006, Jefferson County hosted a public meeting at the WSU Extension to provide information and take public comment on a sewer study being conducted in the Irondale/Port Hadlock area. The goal of the sewer study is to prepare a comprehensive sewer facility plan that will help the County plan for growth in the Irondale/Port Hadlock area through the year 2030. Approximately 50 members of the community attended the public meeting.

During an informal open house period from 5:30 p.m. to 6:00 p.m., there were large boards posted around the room with information about the sewer planning process, the preferred sewer system alternative, and potential locations for wastewater facilities. Public meeting attendees were encouraged to view the information and talk with members of the project team.

The consultant team that the County hired to conduct the Irondale/Port Hadlock sewer study gave a presentation and responded to questions about the cost estimate, potential financing strategies, and progress on preliminary design for the preferred sewer system alternative. The consultant team described next steps in the decision-making process and opportunities for public involvement. Members of the consultant team included project manager Kevin Dour, TetraTech/KCM; Jim Santroch, TetraTech/KCM; Katy Isaksen, Katy Isaksen and Associates; and Bob Wheeler, Triangle Associates. The PowerPoint presentation is attached.

Mr. Wheeler said that having a sewer facility plan approved by the Department of Ecology would make the sewer project eligible for a variety of state and federal funding programs. Ms. Isaksen explained that while developing realistic cost estimates and financing strategies was a required component of the sewer facility plan, it was also important as a way to identify the best financing sources available to launch the sewer system. She said that the consultant team had used conservative assumptions to develop the cost estimates to make sure that the project could be done within the estimated budgets.

During the meeting, many questions from the public related to the decision-making process for the sewer, the results of preliminary design, and the cost estimate and financing strategies. The consultant team, County staff, and County Commissioner David Sullivan (District 2) provided responses based on available information.

Ms. Isaksen emphasized that more work would be done during the implementation phase, after the sewer facility plan was approved, to reduce project costs, secure funding assistance, and finalize the method of distributing costs. Mr. Wheeler reviewed the schedule for completing the sewer facility plan and noted that another public meeting would be scheduled before the plan was finalized.

Public Meeting, July 19, 2006

Citizens & Project Team Discuss Recommended Sewer System Alternative

On Wednesday, July 19, 2006, Jefferson County hosted a public meeting at the Jefferson County Library to provide information and take public comment on a sewer study being conducted in the Irondale/Port Hadlock area. The goal of the sewer study is to prepare a comprehensive sewer facility plan that will help the County plan for growth in the Irondale/Port Hadlock area through the year 2030. Approximately 50 members of the community attended the public meeting.

During an informal open house period from 5:00 p.m. to 6:15 p.m., information was posted on large boards about the sewer planning process, the sewer system alternatives that were considered, potential locations for wastewater facilities, and preliminary cost estimates. Public meeting attendees were encouraged to view the information and talk with members of the project team.

Kevin Dour and Jim Santroch of TetraTech/KCM, the consultant team hired by the County to conduct the sewer study, presented and responded to questions about the alternatives for the sewer system and the rationale, from a technical standpoint, for the recommended alternative. The consultant described next steps in the decision-making process and opportunities for public involvement.

Many questions from the public related to the cost of a sewer system, how effluent disposal/reuse would affect groundwater, and where wastewater facilities would be located. The consultant provided responses based on the preliminary information that was available.

The consultant explained that more detailed information about siting, impacts on hydrology, and cost estimates and financing options would be developed after the selection of a preferred sewer system alternative. They said the focus of the financing options would be on community affordability. They explained that the Board of Jefferson County Commissioners would review the consultant team's technical recommendation at an August 8 workshop and would then make a decision on the preferred alternative.

The consultant team's recommendation is based on engineering feasibility, responsiveness to community concerns, compliance with regulatory requirements, preliminary cost estimates, and environmental considerations.

To provide local input, public workshops were held to advise the sewer study process. Workshop participants included County Commissioners, local agency representatives, community leaders, and other interested parties. Over the course of three workshops, workshop participants and the consultant team reviewed and evaluated a comprehensive array of sewer system alternatives. The workshop participants identified their preferences for each component of the sewer system, including wastewater collection, treatment, effluent disinfection, effluent disposal/reuse, and solids handling. The consultant team used those preferences to help develop the technical recommendation that was presented at the public meeting. The workshops were advertised in advance and were open to the public.

FREQUENTLY ASKED QUESTIONS

Public Meeting on Preliminary Design, Cost Estimate & Financing Strategies

The following is a summary of public comment that the project team received at the October 25, 2006 public meeting. Brief responses to each topic are presented.

Preliminary Design

How much property is needed for wastewater treatment and effluent disposal facilities?

- The minimum footprint for the treatment facility is three acres. The assumption is that rapid infiltration would require about three acres as well. For purposes of the sewer facility plan, it was assumed that six acres would be needed for the treatment facility and six acres for the rapid infiltration facility, in case buffers are needed, solids handling facilities are built, and/or redundant facilities are needed.

There have been recent sewage spills in Poulsbo, Bremerton, and Port Angeles. The damage and cost of a sewage spill here should be considered.

- This system would be more advanced than the systems where spills have occurred.
- Federal and state regulatory agencies have standards and guidelines to ensure reliable wastewater treatment service. Treatment plants are required to have a back-up generator to ensure that plant operation is continuous. The treatment system for the Irondale/Port Hadlock area will be subject to additional requirements as well, since the treated effluent will be discharged to land, and thus to groundwater.
- To build the required redundancy into the treatment system, it is necessary to construct either a storage pond to hold untreated wastewater or an additional treatment train beyond the facility's intended capacity, to be used in the event of a treatment system malfunction.
- Whether to use storage or "n plus one" treatment trains is a design judgment. The preferred sewer system alternative includes a more conservative approach than what is required. The level of redundancy in the preferred alternative could be scaled back if necessary.
- Pump stations are built with a duplicate pumping system and a back-up electrical system. They are also designed so that a portable pump can be used if needed.

Are there membrane bioreactor (MBR) treatment facilities in other rural areas in Washington?

- Indian tribes have done it the most in Washington State. They have built ten MBR facilities. Alderwood Water & Wastewater District is building an MBR facility. The oldest MBR facility in Washington is about three years old.
- MBR systems have been used in Japan for over 15 years to treat toilet water.

- The Department of Ecology has become interested in MBR facilities and has offered encouragement for their use. MBR systems are becoming more common.
- King County is building a 30 million gallon per day MBR facility at Brightwater. The County has done a lot of research into the best type of treatment system.

Can a septic system clean to the level of Class A effluent?

- There are advanced septic systems that will treat individual home wastes to a similar level. However, for a UGA, a proliferation of individual septic systems is not considered an urban service.
- Septic systems that clean to this level are very expensive.

Will biosolids be processed by a digester before they are hauled away from the wastewater treatment plant?

- The proposed method is to collect the solids in a tank and pay for a private entity or city to process and dispose of the solids in compliance with regulations. The consultant team considered the option of building a digester at the Port Hadlock wastewater treatment facility, but found it would cost less to pay someone else to handle the solids.
- This is also a way to delay the capital investment decision about building a solids handling facility until more ratepayers are connected.
- It is recommended that the solids handling method be revisited after five years to reevaluate the cost comparisons when there are more customers to share costs.

Some companies buy solid waste for chemical or fertilizer use. Has revenue generation for processing biosolids been considered?

- Revenue generation would require a huge initial investment to process the solid waste. The economy of scale does not appear to work here, although it does work elsewhere.
- The goal was to propose something more affordable to launch the Irondale/Port Hadlock sewer system.
- The type of system currently proposed would not preclude the community from later pursuing revenue generation or other options.

Decision-Making Process

Who decides whether sewer customers pay a connection fee or join a Utility Local Improvement District (ULID)?

- This would be a decision for the County Commissioners. The Commissioners have the ability to put the decision to a public vote, but ultimately the Commissioners would decide.

Have Washington Department of Fish and Wildlife (WDFW) and the North Olympic Salmon Coalition (NOSC) been consulted?

- The Executive Director of NOSC has been involved in the stakeholder workshops.
- There will be an environmental assessment and probably a State Environmental Policy Act review of the preferred alternative.
- The proposed wastewater treatment system would produce clean, Class A effluent, removing nutrients to a greater extent than septic systems do. As far as the project team is aware, WDFW would prefer a sewer system to septic systems.

Are there communities that have made people connect to sewer?

- The proposed sewer project is still at the planning level. There are many policies still to be determined, such as who will connect and when, with many opportunities for public input.
- Major investments have to be made in septic systems from time to time. In some communities, people wait until they need to make a major investment in their septic system and then connect to sewer instead.
- There are communities that have required people to connect to sewer to increase the financial viability of the system.

At what point does the community get to vote on the project?

- That has not been decided.

Is there a mechanism to rescind the UGA designation?

- It could turn out that a sewer system is too expensive. The sewer facility plan will help provide that answer.
- It is important to remember that the population in the area will grow, and the County's job is to manage that growth in a way that the community finds desirable.

Cost & Financing

At what point will we find out about grants and get hard financial facts to help with decision-making?

- The County is beginning to explore the "art" of securing funding for the project. A completed sewer facility plan will make the project eligible for financial assistance, and the County will be able to apply for grants and low-interest loans. Talking to legislators about ways to support the project is also a good idea.
- In terms of certainty, it could take from six months to two years to know how the financing will come together.
- As with any capital project, the actual cost will not be known until the project is completed.

Is the cost of the property needed for the treatment and disposal facilities included in the cost estimate for 2010 capital costs?

- Yes.

Who are the competitors for grants?

- The competitors for available state and federal grants are other jurisdictions in the State of Washington.

How can a project best be positioned to get grant funding?

- There are different qualifications for each funding program. Richard Johnson, Jefferson County's Wastewater Manager, and members of the consultant team will meet with several funding program administrators at the IACC (Infrastructure Assistance Coordinating Council) Conference in Wenatchee at the end of October to get advice on how best to position the Port Hadlock UGA sewer project with the funding agencies.

How can repayment of financing, other than grants, be guaranteed if not with compulsory participation in the sewer system?

- Specific financing policies will be determined during the implementation phase, after the sewer facility plan is approved.
- The implementation phase will proceed step-by-step, as the sewer study has, with many opportunities for public comment and questions.

Does the cost estimate assume that the sewer system will be built now? What will it cost if we take another ten years to come to agreement?

- The cost was estimated assuming construction in 2009 and 2010. Beyond that, the cost would probably increase, since the price of land and other construction costs will probably continue to rise.

Sewer Study Assumptions

The cost estimate for an Equivalent Residential Unit (ERU) includes an assumption about the number of ERUs that would exist. Where did the assumption come from and was built-out assumed?

- The Jefferson County Planning Department provided current population numbers as well as population estimates for 2024. Using that estimated rate of growth, the consultant team extrapolated the estimated population to the year 2030, which is the sewer planning horizon. There will be an estimated 3900 ERUs by 2030.
- Build-out is projected to occur some time after 2050, although depending on land use decisions, it may never actually occur on the ground.

Did the County's population estimates, especially for commercial growth, look right?

- Although the consultant team was not asked to do a full population analysis, they did use multiple methods to backcheck the 60:40 ratio of residential to commercial development that was used in their projections. They looked at the current zoning of the sewer planning area, checked the ratio of

commercial to residential water usage, and checked the ratio of development in similar communities.

Public Meeting on Combined System Alternatives

The following is a summary of public comment that the project team received at the July 19, 2006 public meeting. Brief responses to each topic are presented.

Collection System

Whether or not it makes sense to pay a higher initial investment for gravity collection

- Gravity collection systems can last up to 50 years. Pressure sewer systems have a shorter service life because key components (septic tanks and pumps) have to be replaced after about 20 years. This analysis looks at a 20-year time span for comparison purposes, because of the 20-year planning period required by the Growth Management Act and because pressure sewers have a shorter service life. Pressure sewers are often thought of as an inexpensive "starter kit" for a sewer system with planned replacement after 20 years with a gravity sewer when the area is more densely populated and there are more people to pay. Although this approach is more expensive in the long run, it may be the only way a community can afford to get started. Pressure systems will work, but people must be aware that it's a "pay-as-you-go" system and it is less convenient because of ongoing maintenance.
- After 20 years, the total estimated system cost for gravity is lower than the total estimated system cost for a pressure system.

Separating gray water from the wastewater stream

- A separate gray water system would likely have greater costs because of the need for two separate systems on each property - gray water and "black" (toilet) water systems.
- Plumbing retrofits would be required within existing homes in order to separate gray water from black water.
- Separating gray water at the home would reduce the total amount of water conveyed within the wastewater collection system. Less water in the sewer system would impact pipeline design parameters. For example, most gravity collection systems are designed for a certain amount of water to wash solids down the pipes. Removing gray water might generate a need to build steeper gravity collection pipes in order to keep solids moving, which would need to be constructed deeper and thus cost more. Also, more frequent line flushing may be required in order to dislodge solids deposited in pipelines.
- Sending gray water to a wastewater treatment plant for treatment could help prevent gray water from possibly degrading groundwater supplies.
- A septic tank and drainfield would need to be maintained for gray water separation. A second tank and pump would be needed if a pressurized sewer system were installed.
- The design team acknowledges the Port Hadlock community's mandate to pursue reuse options for the communities treated wastewater. Although gray water separation can be a viable reuse option, it is viewed by the design team

as less effective, more costly and less reliable than the proposed land-based disposal/reuse option using a rapid rate infiltration system.

Treatment Alternatives

How costs compare between the membrane bioreactor (MBR) and the sequencing batch reactor & filter (SBR)

- The total cost for MBR over 20 years could be up to 20% more than the total cost for SBR. Since the 20 year costs associated with a MBR system account for approximately 37% of the total costs of the sewer system, this would result in an overall cost increase of around 7%.

How odor management compares among the treatment alternatives

- Although the project team has used the Port Townsend wastewater treatment facility as a reference for appropriate odor control and aesthetics, the City of Port Townsend uses an oxidation ditch treatment technology and the proposed treatment technology for Port Hadlock is an MBR. Some comments from the public have indicated that a higher level of odor control may be necessary. The County is budgeting for a wastewater treatment facility that is a good neighbor.
- There is some difference in the effort necessary to provide odor control among the three treatment technologies. Since SBR and MBR have smaller areas of exposed water surface than oxidation ditches, it is less expensive to cover them and control odor for them. MBR or SBR treatment systems would provide a better level of odor control as compared to the oxidation ditch system at the Port Townsend facility.

Building a storage pond vs. an additional treatment train

- There are Ecology requirement for providing redundancy so that the treatment process has a certain level of reliability. There are two options for including redundancy: one is to build a single treatment train and a storage pond, and the other is to build two treatment trains. The assumption in our phasing plans is that two treatment trains will be built initially, storage will be built at the first expansion, and two more treatment trains will be built at the second expansion

Effluent Disposal/Reuse Alternatives

Health impacts of effluent disposal

- We are planning to treat wastewater to Class A effluent levels, which is safe for reuse. It is the best quality of effluent. For Class A treatment, solids and dissolved organics are removed, and the effluent it denitrified to a level of 1 part per million and disinfected. Drinking water is allowed to have up to 10 parts per million of nitrogen.

Possibility of water reuse

- The wastewater will be treated to reuse standards allowing the Port Hadlock sewer facility to explore future reuse opportunities. For example, treated effluent may be used to irrigate ballfields.

Solids Handling Alternatives

Whether to dewater biosolids before they are hauled away

- The biosolids would be partially stabilized before they are shipped away, but they would not be dewatered or disinfected at that point. We have found that there would be a tremendous initial capital investment required to do additional dewatering and stabilization. The design team has made a strategic call that it makes financial sense to contract out the hauling and reuse of the facility's biosolids. This would allow the County flexibility to continue with a contractor in the future if it remains financially viable or to later invest in solids handling equipment when more users are connected to the wastewater system.

Health impacts of biosolids disposal

- One identified contractor, Kitsap Biorecycle, mixes the biosolids with lime to produce an "artificial soil." This soil is then applied to fields and immediately plowed under to minimize the potential for odors and pests.

Facility Siting

Potential locations of treatment and disposal/reuse facilities

- The project team will take into consideration public concern about using the "Central Site" for wastewater treatment and/or disposal/reuse. There has been interest expressed in keeping that property, which is near the commercial core of Port Hadlock, available for development.
- The location of the treatment and/or effluent disposal/reuse facilities will influence the total cost of the sewer system. Cost considerations will also be taken into account.

Effluent disposal/reuse being used to recharge Chimacum Creek

- The project team will look carefully at the hydrology of the area to determine, among other things, whether effluent disposal/reuse would provide recharge to Chimacum Creek

Proximity of potential disposal/reuse sites to wells

- and whether effluent disposal/reuse would impact any wells, such as Kivley Well or other private wells. Also, there are regulations and required setbacks to protect wells.

Cost & Financing

The schedule for developing cost estimates and financing options.
What the sewer system might cost?
How financing might work?

- Jefferson County has emphasized that constructing a sewer system in the Irondale/Port Hadlock area must be affordable for the community. As part of the sewer study, preliminary 20-year life cycle cost estimates have been prepared as a way to compare sewer system alternatives. Once the County has identified a preferred sewer system alternative, the consultant team will use the preferred alternative to develop a detailed cost estimate as well as financing options. A preferred sewer system alternative will be selected after the Board of County Commissioners workshop on August 8. The status of the cost estimate and financing options will be presented at a public workshop on preliminary design, cost, and financing options and at a public meeting in October.

The length of time available for financing the sewer system

- The Growth Management Act requires a plan to implement the sewer system with a near term (6-year) and long term (20 year) plan.

What is included in the 20-year life cycle cost estimates

- The 20-year life cycle cost estimates for the sewer system include capital cost for sewers, on-site costs for connection to the sewers, wastewater treatment (including treatment plant, disinfection, effluent disposal, and solids handling), and the present value costs for operations and maintenance of all facilities over 20 years.

How costs would be divided among sewer customers

- Although the cost of the sewer system per user decreases the more users there are, the idea is to work out a financing plan whereby all users end up paying the lower cost that would be attained with all forecasted customers hooked up at the end of the 20-year planning period.

Sewer Planning Process

Whether the sewer planning boundary can be changed

- Making any changes to the 20-year sewer planning boundary would be a policy decision for the community and the County. From a technical standpoint, it is possible to alter the area that would be served by the sewer system.
- The 6-year planning boundary is useful for planning purposes, but the actual order in which properties connect to the sewer will be determined during implementation.

Whether the sewer planning boundary will become the urban growth area boundary

- It is presumed that the sewer planning boundary will coincide with the urban growth area boundary. This is because urban services must be provided within an urban growth boundary and sanitary sewers are considered a key urban service.

How long a sewer system is anticipated to last

- Although individual components of the sewer system may have a longer or shorter lifetime, the entire sewer system is assumed to have a 20-year life for this comparison.

Whether everyone will have to connect to the sewer

- The Sewer Facility Plan must demonstrate that it will be possible for everyone to connect to the sewer system by the end of the 20-year planning period. However, the way in which customers would be required to connect to the sewer system will be a policy decision for the community and the County.